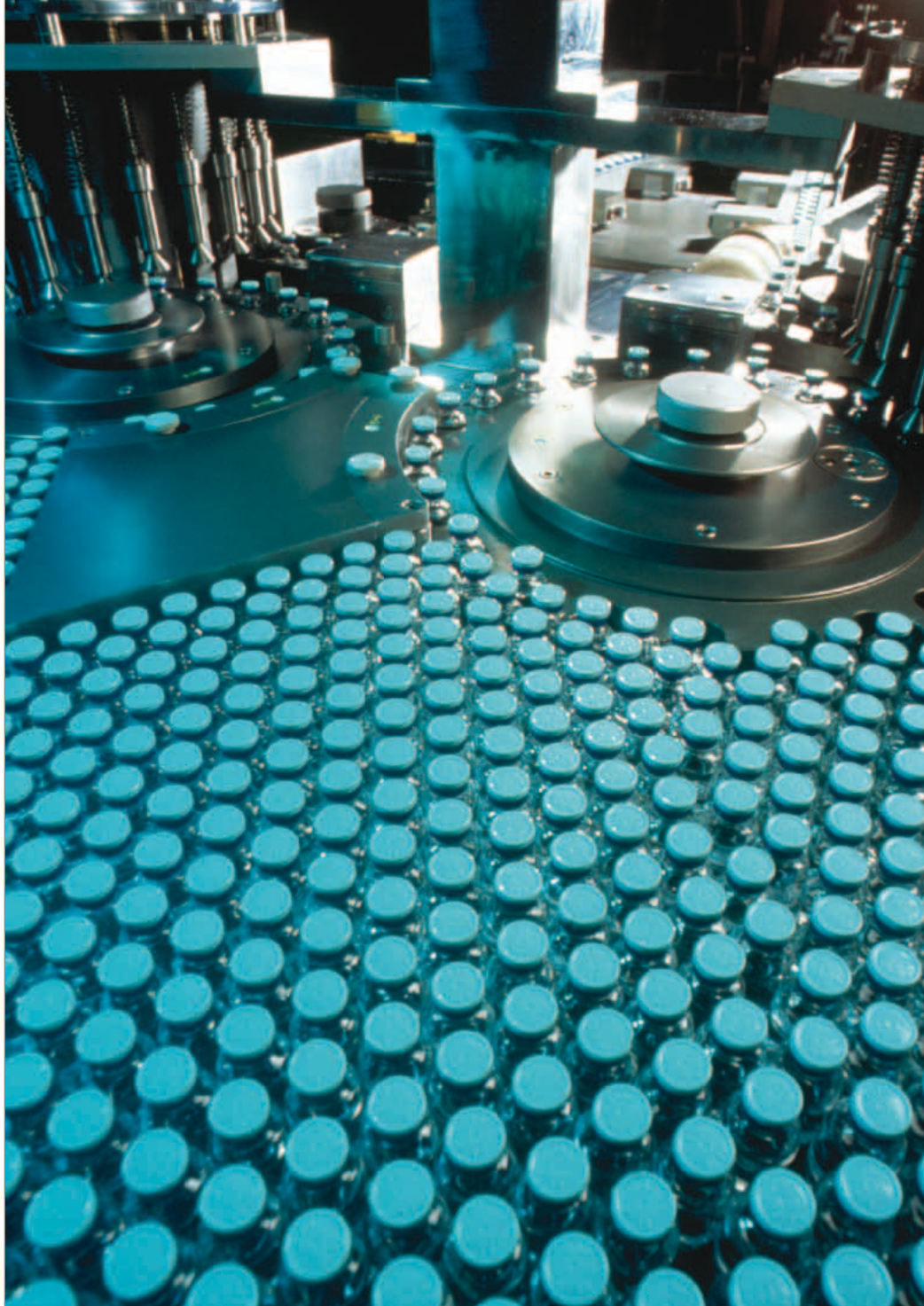


aerospace
climate control
electromechanical
filtration
fluid & gas handling
hydraulics
pneumatics
process control
sealing & shielding



Motion Control Products

Drives, Motors and Controller Products



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.
- To the extent that Parker or its subsidiaries or authorized distributors provide component or system options based upon data or specifications provided by the user, the user is responsible for determining that such data and specifications are suitable and sufficient for all applications and reasonably foreseeable uses of the components or systems.

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Drives

Motors

Gearboxes

Controller Products

Parker Hannifin

The global leader in motion and control technologies and systems

Global Partnerships Global Support

Parker is committed to helping make our customers more productive and more profitable through our global offering of motion and control products and systems. In an increasingly competitive global economy, we seek to develop customer relationships as technology partnerships. Working closely with our customers, we can ensure the best selection of technologies to suit the needs of our customers' applications.

Electromechanical Technologies for High Dynamic Performance and Precision Motion

Parker electromechanical technologies form an important part of Parker's global motion and control offering. Electromechanical systems combine high performance speed and position control with the flexibility to adapt the systems to the rapidly changing needs of the industries we serve.

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



Parker Hannifin Corporation

With annual sales exceeding \$13 billion in fiscal year 2012, Parker Hannifin is the world's leading diversified manufacturer of motion and control technologies and systems, providing precision-engineered solutions for a wide variety of mobile, industrial and aerospace markets. The company employs approximately 60 000 people in 48 countries around the world.

Parker has increased its annual dividends paid to shareholders for 56 consecutive fiscal years, among the top five longest-running dividend-increase records in the S&P 500 index. For more information, visit the company's website at www.parker.com, or its investor information website at www.phstock.com.

Issue: 09/2012

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.

Electromechanical Worldwide Manufacturing Locations

Europe

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

Asia

Wuxi, China
Chennai, India

North America

Rohnert Park, California
Irwin, Pennsylvania
Charlotte, North Carolina
New Ulm, Minnesota



Offenburg, Germany

Local Manufacturing and Support in Europe

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

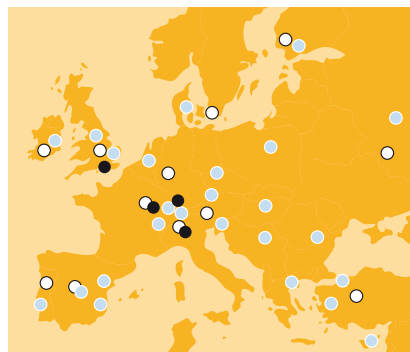
For contact information, please refer to the Sales Offices on the back cover of this document or visit www.parker.com



Milan, Italy



Littlehampton, UK



- Electromechanical Manufacturing
- Parker Sales Offices
- Distributors

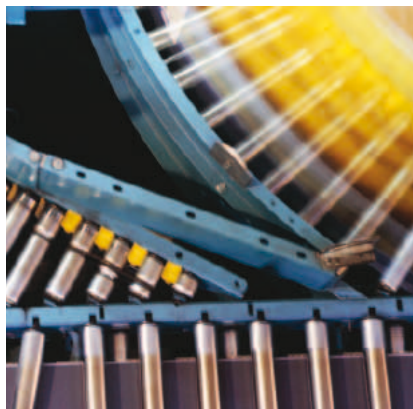


Dijon, France

Solutions to Improve Productivity, Increase Flexibility and Save Energy

Process Productivity and Reliability

Parker brings together the technology and experience required for continuous process applications across many industries. Electromechanical and drive products combine application specific functionality to ensure precise speed control and reliable performance. Parker combines more than 30 years of application experience with a global sales and support network that help you increase your machine availability.



	AC-Drives	DC-Drives	Direct-Drive Motors	Servo Drives and Motors
Converting machinery				
Folding, gluing, stitching and collating	✓	✓		✓
Coating, laminating and foil stamping	✓	✓	✓	✓
Slitting, cutting and rewinding	✓	✓	✓	✓
Plastics processing machinery				
Plastic extrusion	✓		✓	
Injection moulding	✓		✓	✓
Thermal forming	✓		✓	✓
Wire and cable				
Wire and cable manufacturing	✓	✓		✓
Winding/unwinding	✓	✓	✓	
Extrusion for wire and cable	✓	✓	✓	
Printing Machinery				
Web/sheetfed offset	✓		✓	✓
Flexo printing	✓		✓	✓
Gravure printing	✓		✓	✓
Shaftless printing	✓		✓	✓
Other industries				
Paper machinery	✓		✓	
Sugar processing	✓	✓		
Steel production	✓	✓	✓	
Construction materials	✓	✓		
Automotive test rigs	✓	✓	✓	

Energy Efficiency and Clean Power

Parker has developed the technology to maximize the efficient use of energy in industrial, mobile and infrastructure environments.

Hybrid Vehicle Technology

Parker has adapted its electric drive technologies for use in hybrid electric vehicles, including utility vehicles and passenger vehicles. Examples include inverters and motor drives, as well as electric drive motors.

Energy-savings for pumps, fans and compressors

Parker has the drive technology to help you make significant energy savings in the operation of pumps, fans and compressors in both industrial and infrastructure applications, including:

- Commercial refrigeration
- Water and wastewater treatment
- Building automation
- Industrial processes
- Hydraulic systems



Power Generation and Conversion

Using proven inverter technology, Parker has developed numerous solutions for the conversion of energy for commercial use from a variety of sources, including wind, wave and energy storage devices.

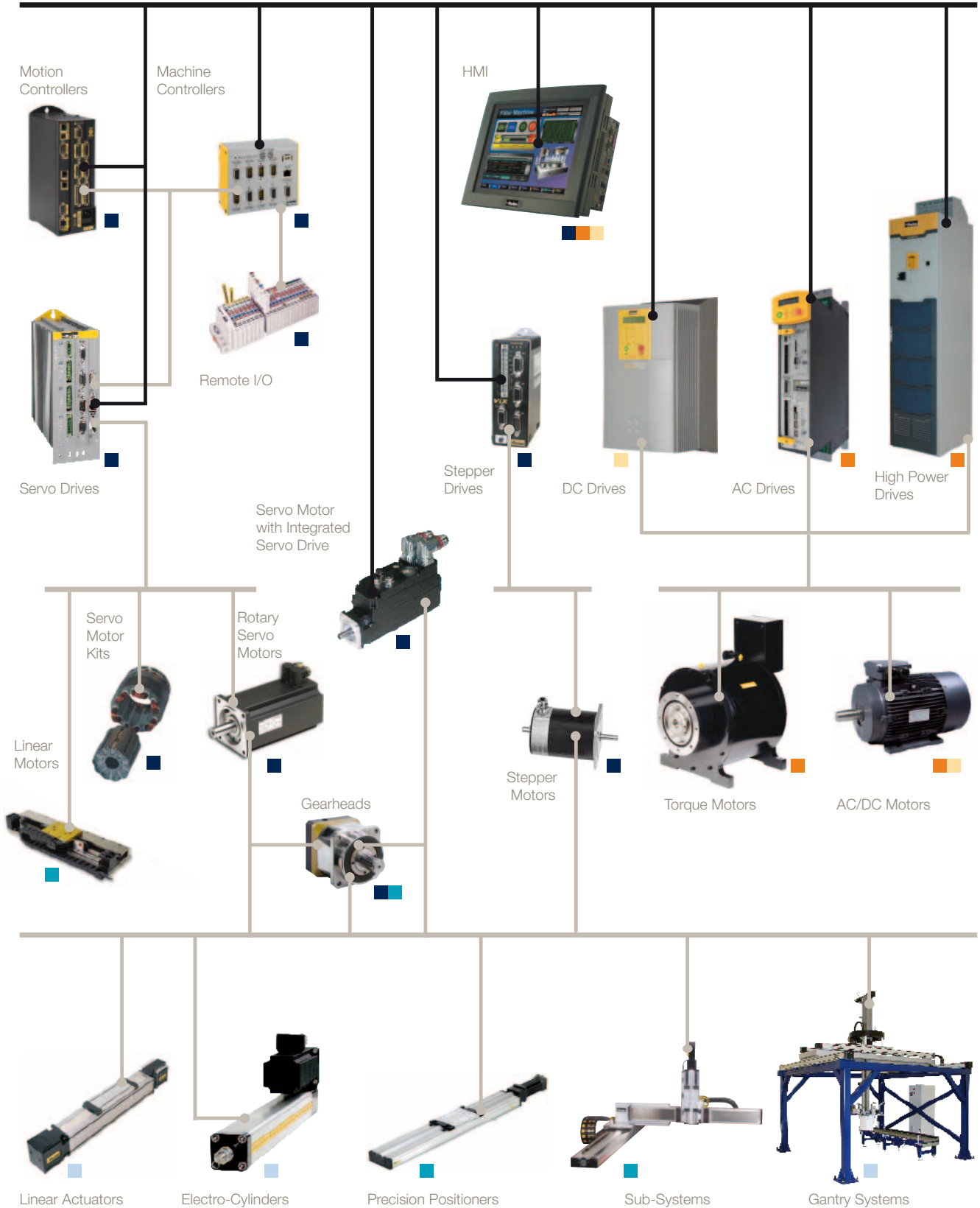
Motion Control Systems for Total Production Flexibility

Parker's electromechanical automation customers enjoy total production flexibility in their general and precision motion control applications. Complete packaged linear positioning systems, coupled to servo and stepper drives and controls, enable our customers to develop a complete motion solution with one partner. Parker provides the products for a wide range of motion needs- power, speed, travel, force-with easy to use controls designed to work on multiple control and communication platforms. Additionally, Parker's products can be easily customized to suit specific applications.



	Mechanical Actuators	Motors and Gearheads	Drives	Controls	HMI
Assembly machinery					
Pick and Place	✓	✓	✓	✓	✓
Lifting	✓	✓	✓	✓	
Transfer machinery	✓	✓	✓	✓	✓
Automotive industry					
Body shop	✓	✓	✓	✓	
Paintshop applications	✓	✓	✓	✓	✓
Transfer machinery	✓	✓	✓	✓	✓
Packaging machinery					
Primary, secondary, tertiary	✓	✓	✓	✓	✓
Handling machinery	✓	✓	✓	✓	✓
Food and Beverage processing machinery					
Processing machinery	✓	✓	✓	✓	
Packaging machinery	✓	✓	✓	✓	
Handling machinery	✓	✓	✓	✓	✓
Material handling systems					
Transfer systems	✓	✓	✓	✓	✓
Pick and place systems	✓	✓	✓	✓	✓
Material forming machinery					
Presses	✓	✓	✓		✓
Tube bending	✓	✓	✓	✓	✓
Die Casting	✓	✓	✓		✓
Injection Molding / Plastic Extrusion	✓	✓	✓		✓
Transfer Systems	✓	✓	✓	✓	✓
ePump (Variable Speed HPU)		✓	✓	✓	
Machine tools					
High Speed Servo Spindles		✓			
Loader/Unloader	✓	✓	✓	✓	
Palletizing/Transfer	✓	✓	✓	✓	✓
Rotary/Tilting Tables		✓			
Door Systems	✓	✓	✓	✓	
Semiconductor machinery					
Front end processes	✓	✓	✓	✓	✓
Inspection machinery	✓	✓	✓	✓	✓
Packaging machinery	✓	✓	✓	✓	✓
Lithography	✓	✓	✓	✓	
Medical equipment					
Device manufacturing	✓	✓	✓	✓	✓
Product packaging and dispensing	✓	✓	✓	✓	✓
Scanning equipment	✓	✓	✓		
Pumps and analyzers		✓	✓		
Entertainment					
Theatre and studio automation	✓	✓	✓	✓	
Simulation and amusement rides	✓	✓	✓		

Complete Range of Solutions



Literature



Motion Control Products

- Drives
- Servo Motors
- Gearboxes
- Controller Products

192-490123



AC Drives and Motors

- Purpose Drives
- Compact Drives
- Modular Drives
- HMI
- Accessories
- AC Motors

HA501078



DC Drives and Motors

- Digital DC Drives
- Analogue Converters
- HMI
- Accessories
- DC Motors

HA501079



Linear Actuators

- Toothed Belt Driven Actuators
- Screw Driven Actuators
- Linear Motor Driven Actuators

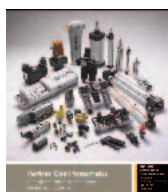
192-490023



Precision Technology

- Screw Driven Tables
- Linear Motor Driven Tables
- Linear Motors
- Linear Positioners
- Miniature Stages

192-591011



Parker One Pneumatic

A complete range of pneumatic system components

- Actuator Products
- Control Devices
- Air Preparation & Airline Accessories

PDE2600PNUK

Value Added Services

In addition to providing products and systems, Parker also provides a number of value added services to our customers:

- **Programming and commissioning services**
- **Power quality and energy surveys**
- **24-hour support and service**
- **Product repairs**
- **Product training**



Customization

Many automation applications cannot be solved with off the shelf products. Parker's products are designed to be versatile as well as easy to configure for the most of industrial and process applications. Some customers require solutions that can't be found in a catalogue, and Parker has the resources and expertise available to provide solutions:

- **Custom motor designs**
- **Customized mechanical positioning systems**
- **Customized control functionality**
- **Customized communication solutions**

System Solutions

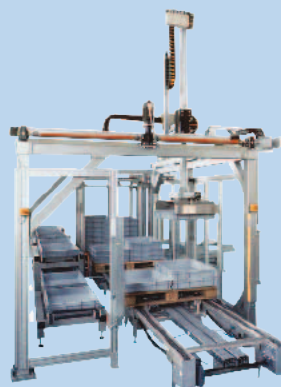
Parker offers system design and manufacturing in two main categories:

Drive Systems

Complete AC and DC drive systems across a wide power range, from less than 1 kW to more than 2 MW. Systems typically include electrical enclosure, ancillary electronic equipment and full documentation. Commissioning and support services are standard.

Mechanical Systems

Parker has more than 20 years of experience in providing a variety of multiple axis mechanical positioning systems, complete with motors, drives and controls. Typical applications include material transfer and pick and place gantry systems. Additionally, Parker designs and builds custom precision (micron and submicron level) positioning systems, integrating precision bearing, feedback and drive systems, including Parker's range of linear servo motors. Each system ships complete with motors, drives and controls, and can include the programming and commissioning.



Drives

Servo Drives

Stepper Drives

DC Servo Drives



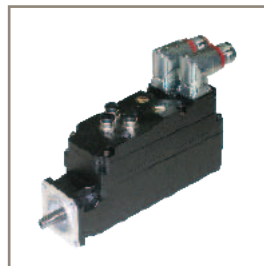
Compax3



SLVD-N



TPD-M



Motornet DC



Hi-Drive



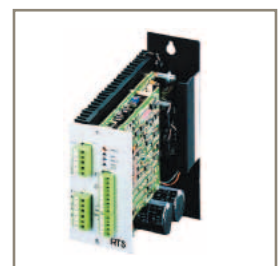
638



ViX Servo



ViX Stepper



RTS

Markets and Applications



Product	Compax3	SLVD-N	TPD-M	Motornet DC	Hi-Drive	638	ViX Servo	ViX Stepper	RTS
Description	Intelligent Servo Drive	Compact Servo Drive	Triple Axis Servo Drive	Integrated Motor/ Servo Drive	Flexible Servo Drive	Servo Drive	Micro Servo Drive	Micro Stepper Drive	DC Servo Drive
Food, Pharma & Beverage	■	■	■	■	■				
Packaging Machines	■	■	■	■	■		■	■	
Material Forming	■		■		■				
Material Handling	■	■	■	■	■	■		■	
Factory Automation	■	■	■	■	■	■			
Life Science Diagnostic							■	■	■
Automotive Industry / In-Plant	■	■	■	■	■				
Printing Industry	■		■	■	■	■			
Textile Machines	■	■	■		■				
Robotics	■	■	■	■	■		■		
Machines Tools		■	■		■				
Servo Hydraulic Pumps	■								

Key Features

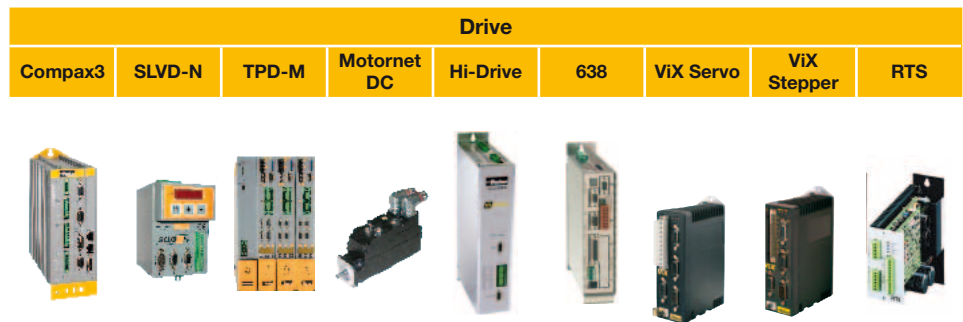
Product	Key Features	
Compax3	<ul style="list-style-type: none"> • Simple system integration • Fieldbus & Ethernet Communication • Wide Power / Voltage Range • Drives all motor types • Supports most feedback devices 	<ul style="list-style-type: none"> • Standard IEC61131-3 programming • Application software integrated • Drive based safety • Fast control loops for demanding applications
SLVD-N	<ul style="list-style-type: none"> • Miniature / Compact Servo Drive • Optimized for centralized automation structures 	<ul style="list-style-type: none"> • Use for applications with low number of axis • CANopen / EtherCAT communication • Simple application based programming
TPD-M	<ul style="list-style-type: none"> • Triple Servo Axis per Unit (3 drives in 1 Unit) • Optimized for centralized automation structures 	<ul style="list-style-type: none"> • Use for applications with high number of axis • CANopen / EtherCAT communication • Simple application based programming
Motornet DC	<ul style="list-style-type: none"> • Servo Electronics integrated into the motor • Use in totally centralized automation structures • Dramatically reduced control cabinet space 	<ul style="list-style-type: none"> • Reduced cabling needs • CANopen / EtherCAT communication • Modular machine design
Hi-Drive	<ul style="list-style-type: none"> • Simple programming • Multiple communication & feedback 	
638	<ul style="list-style-type: none"> • Simple programming • Multiple communication & feedback 	
ViX Servo	<ul style="list-style-type: none"> • Ultra compact housing • Low voltage drive 	
ViX Stepper	<ul style="list-style-type: none"> • Ultra compact housing • Low voltage drive 	
RTS	<ul style="list-style-type: none"> • Single / Three phase supply • Battery supply 	<ul style="list-style-type: none"> • Operates on DC motors with or w/o a tacho

Drives by Function



Product	Compax3	SLVD-N	TPD-M	Motornet DC	Hi-Drive	638	ViX Servo	ViX Stepper	RTS
Description	Intelligent Servo Drive	Compact Servo Drive	Triple Axis Servo Drive	Integrated Motor/ Servo Drive	Flexible Servo Drive	Servo Drive	Micro Servo Drive	Micro Stepper Drive	DC Servo Drive
Servo	■	■	■	■	■	■	■		
Stepper								■	
DC Drive									■
Servo Motor	■	■	■	■	■	■	■		
Induction Motor	■	■	■		■				
Direct Drive Motors	■	■	■		■				
DC Motors									■
Stepper Motors								■	
Absolute Feedback	■	■	■	■	■	■			
Low Voltage Drives							■	■	
110/230 VAC	■	■	■	■	■	■			■
400/460 VAC	■		■	■	■	■			■
Single Axis Technology	■	■			■	■	■	■	■
Multi Axis Technology	■		■	■					
Integrated Motor/Drive				■					
Fieldbus Connectivity	■	■	■	■	■	■	■	■	
Ethernet Communication	■	■	■	■	■	■			
Standard Safety (STO)	■	■	■	■	■	■			
Advanced Safety	■								
IEC 61131-3 Programming	■	■			■				
Proprietary Programming		■	■	■	■	■	■	■	
Application Macros	■	■	■	■					

Associated Drives & Motors



		Drive											
		Compax3	SLVD-N	TPD-M	Motornet DC	Hi-Drive	638	ViX Servo	ViX Stepper	RTS			
Motor	SMB / SMH		■	■	■		■	■	■				
	MB / MH		■	■	■		■	■	■				
	NX		■	■	■		■	■	■				
	EX		■	■	■		■	■	■				
	NV		■				■						
	NK		■	■	■		■	■	■				
	SKW					n/a							
	HKW												
	TK		■				■						
	SY									■			
	RS											■	
	RX												■
	AXEM												■

Intelligent Servo Drive Compax3

Overview

Description

Compax3 is Parker Hannifin's global servo drive. The drive series includes single and multi axis drives as well as hydraulic controllers. It features a power range from 1 to 110 kVA.

The servo drives are completely developed and manufactured in Germany. An additional Compax3 production site was established in the US. As a global servo drive controller, Compax3 is of course available all over the world. Service and support sites are located in the vicinity of all major industry locations - worldwide. The "Parker Authorised Distribution Partners" do play an important role in this context - well-trained and experienced application and support specialists will provide the necessary professional support in any situation.

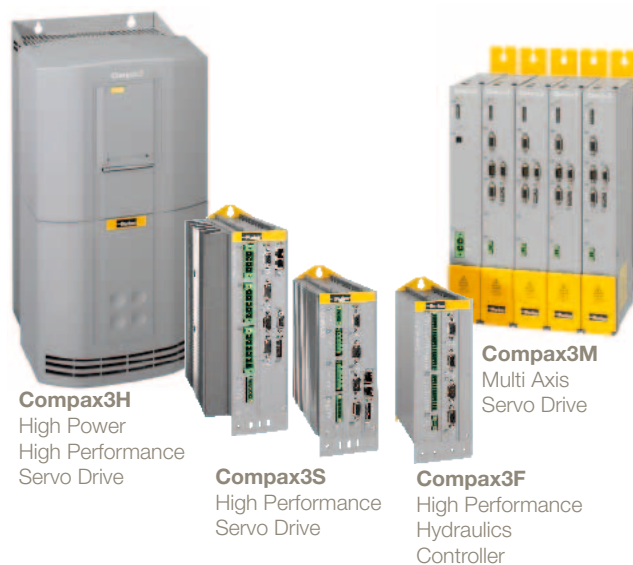
Features

Hardware

- Power range from 1 to 110 kW
- 1 encoder output / 1 encoder input
- 8 digital inputs / 4 digital outputs
- 2 analog inputs (14 Bit)
- 2 analog outputs (8 Bit)
- Multiple fieldbus options
- Extensive safety technology

Technology Functions

- I10T10: Drive control via: velocity/torque control, step/direction input, encoder input
- I12T11: Positioning via digital I/Os, RS232/RS485, absolute/incremental positioning, registration mark related positioning, electronic gearbox, dynamic positioning
- T30: Programming based on IEC61131-3 with CoDeSys
 - PLCOpen function modules
 - IEC61131-3 - standard modules
 - C3-specific function modules
- T40: T30 functionality + cam function
- Technology controller with integrated Motion PLC
Compax3 powerPLmC-C20



Drives
Compax3

Technical Characteristics - Overview

Device:	Current [A]		Supply voltage	Power [kVA]
	I _{cont.}	I _{peak} (<5 s)		
Compax3				
S025V2	2.5	5.5	1 *	1.0
S063V2	6.3	12.6	230/240 VAC	2.5
S100V2	10	20	3 *	4.0
S150V2	15	30	230/240 VAC	6.0
S015V4	1.5	4.5	3 * 400/480 VAC	1.25
S038V4	3.8	9.0		3.1
S075V4	7.5	15		6.2
S150V4	15	30		11.5
S300V4 ⁽¹⁾	30	60		25.0
H050V4	50	75	3 * 400/480 VAC	35.0
H090V4	90	135		70.0
H125V4	125	187.5		91.0
H155V4	155	232.5		109.0

⁽¹⁾ Operation with condenser module C4.

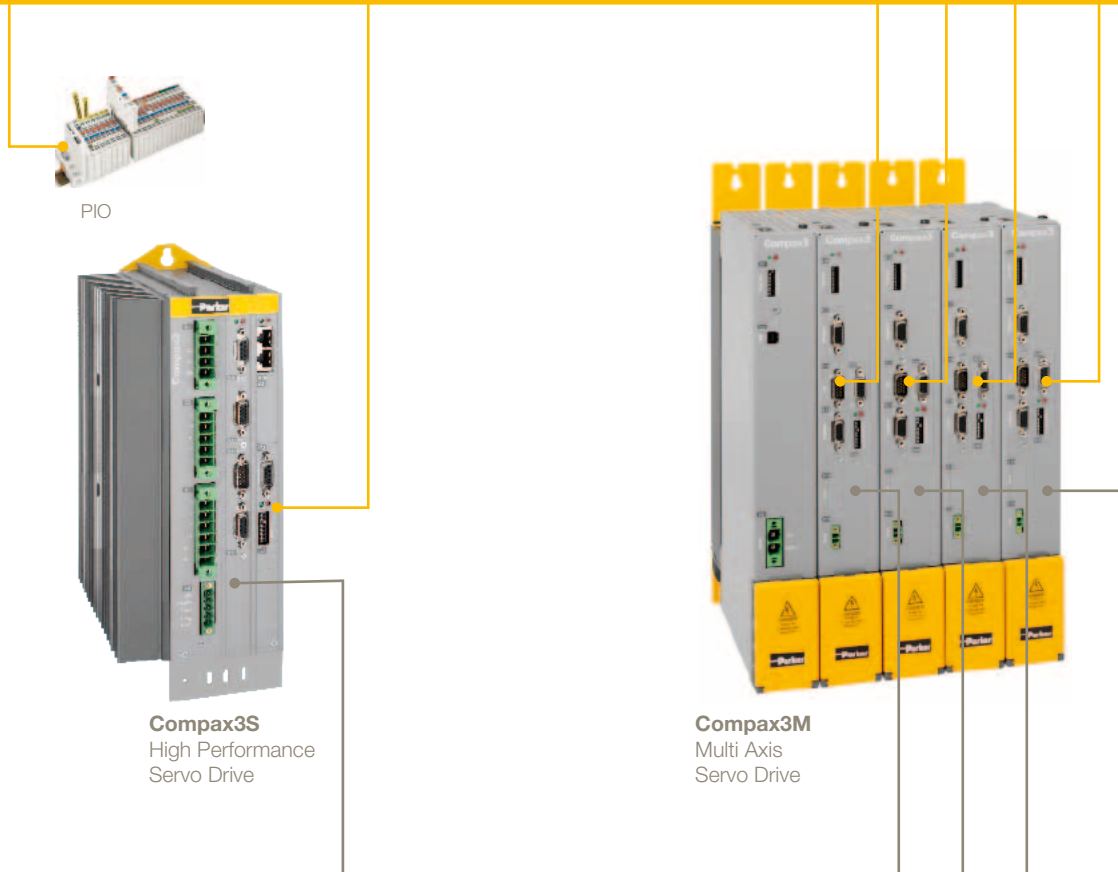
Device:	Current [A]		DC bus voltage
	I _{cont.}	I _{peak} (<5 s)	
Compax3			
M050D6	5	10	325 ... 679 VDC (Rated voltage 560 VDC)
M100D6	10	20	
M150D6	15	30	
M300D6	30	60	

System Layout

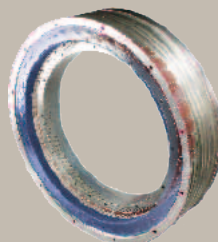
Ethernet



Communication channel



Synchronous Servo Motors



Direct drives



Handling Actuators

PIO



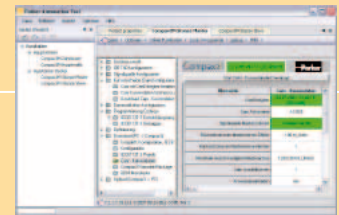
Compax3H
High Power
High Performance
Servo Drive



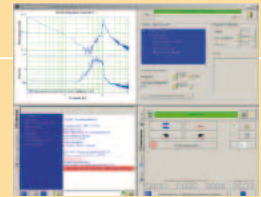
Compax3F
High Performance
Hydraulics
Controller

Parker Automation Tools

IEC 61131-3
PLCopen
Data handling
Visualization
Communication (Process Control)
Access to all components
Project management



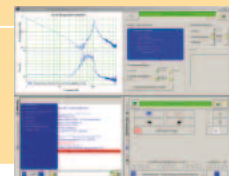
Communication
Multi-axis tool
C3 ServoManager
Drive Interface



IEC 61131-3
PLCopen
CamDesigner
Optimization
Setup
Diagnosis / Analysis / Maintenance
Oscilloscope

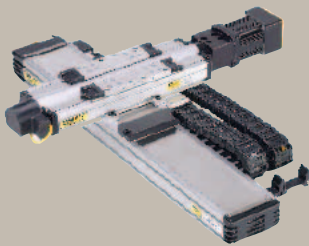


MotorManager
Motor library
HydraulicsManager
Valve library

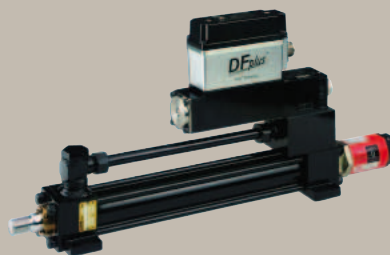


Dimensioning
Tool

PC Software



Precision Actuators



Hydraulics Components

Control Technology

Real-time signal processing

- Reduction of the quantization noise
- Increase of the signal resolution
 - Due to oversampling of the speed and current signals
- Online feedback error compensation of offset and gain errors
- 14 Bit resolution increase (Increase of the resolution of the scale graduation of up to 14 Bit)
 - By interpolation of sine-cosine feedback signals
- Determination of the speed by the observer technique
- Doubling of the controller bandwidth
 - By load torque observer principle

Jerk-limited setpoint generation, resulting in:

- Gentle handling of the moved goods
- Increased service life of mechanical components
- Overshoot free positioning
- Reduced excitation for mechanical resonance frequencies

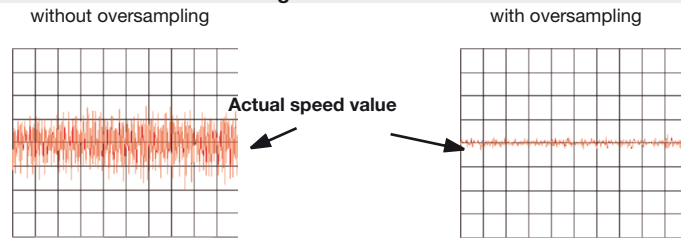
Control:

- Controller in the feedback path helps avoid differentiating components in the numerator of the transmission function (which will result in a significant overshoot of the actual value)
- Automatic and robust controller design
 - User-oriented optimization parameters "damping" and "stiffness"
- Optimization of the response behavior
- Minimization of the following error
 - Due to feedforward of speed, acceleration, motor current and jerk
- Dual Loop Option
 - The load control can be activated via an additional feedback system for the acquisition of the actual position of the load.

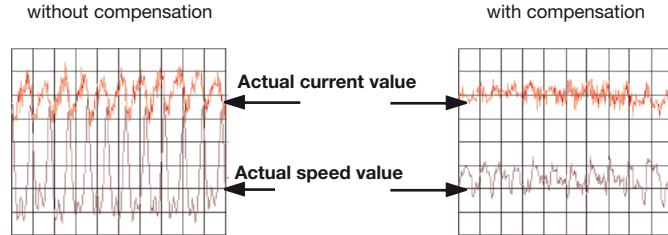
Commissioning / controller optimization

- Automatic determination of the load moment of inertia
- Compax3 MotorManager for determining the motor characteristics and the motor position feedback
- Optimization with integrated oscilloscope function

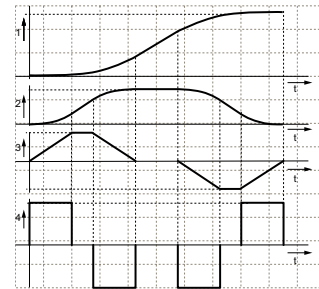
Signal resolution



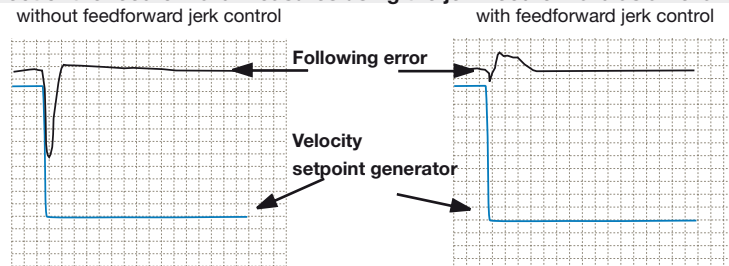
Online feedback error compensation



- 1: Position
- 2: Speed
- 3: Acceleration
- 4: Jerk



Effect of the feedforward measures using the jerk feedforward as an example



Safety Technology

The Compax3M and Compax3S drive controllers support the "safe torque off" (STO) safety function in the sense of the "Safe Stop", with protection against unexpected startup according to the requirements EN ISO 13849-1 Category 3, EN ISO 13849-1 PL=d/e (Compax3S), PL=e (Compax3M) and EN 1037.

Together with the external safety control device, the "safe stop 1" (SS1) safety function according to the requirements of EN ISO 13849-1 category 3 can be used.

Switching off the motor torque must be effected by the machine controller. According to a risk analysis which must be carried out according to the machine standard 89/392/EWG or EN 292; EN 954, EN ISO 13849-1 and EN 1050, the machine manufacturer must project the safety system for the entire machine including all integrated components. This does also include the electrical drives.

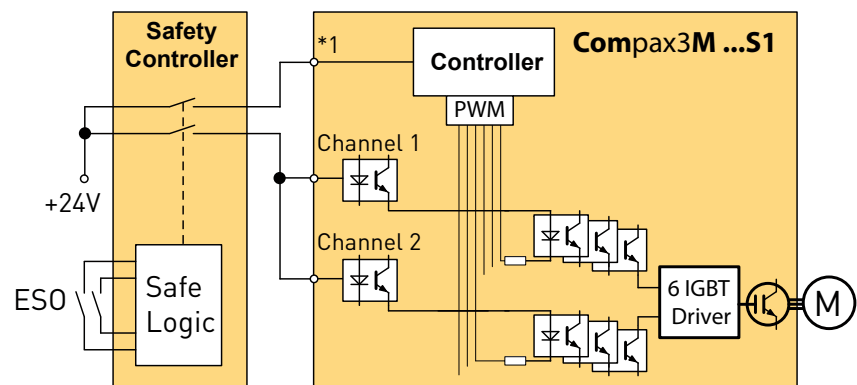
Compax3 with "Safe Torque Off" - STO

The STO safety function or The "safe torque off" safety function was differently implemented for the Compax3S and Compax3M families. In the Compax3S, the feedback paths of the 2 channel switch-off must be integrated into the external connection for monitoring. For the Compax3M, a protocol describing the orderly function of the safety function must be established upon setup and after defined maintenance intervals. The safety function in the Compax3M was implemented entirely without wear-prone relay technology. The Compax3H does not feature any safety function.

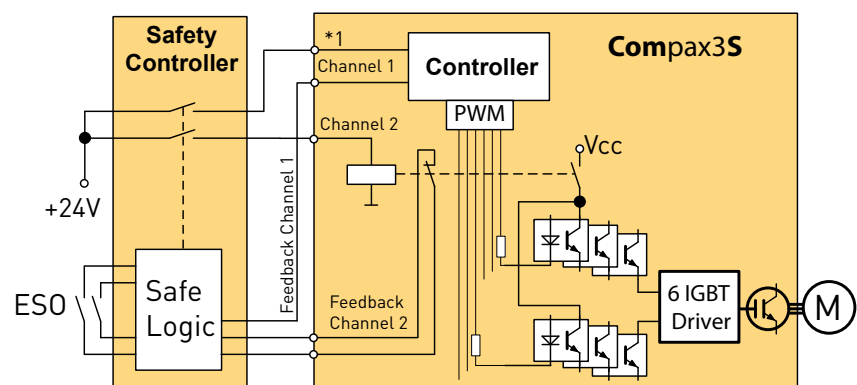
Safety functions with Compax3M

- SS1 - Safe Stop 1
 - SS2 - Safe Stop 2
 - SOS - safe operating stop
 - SLS – Safely Limited Speed
 - SLP - Safely Limited Position
 - SLI – Safely Limited Increment
 - SDI – Safe Direction
 - SSM - Safe Speed Monitor (Diagnostics output for SLS)
- The safety functions correspond to the standard in accordance with EN13849-1 PL=e.

STO function on the Compax3M



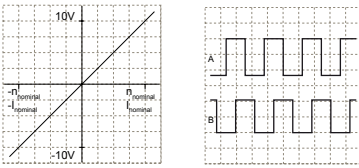
STO function on the Compax3S



ESO = Emergency switch off
*1 Deceleration Input

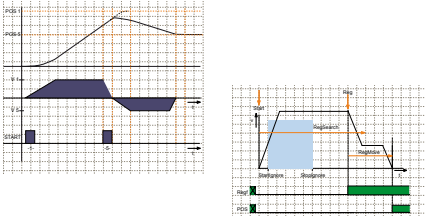
Device Technologies

Compax3 I10T10: Step/Direction and Analog Command Input



- ± 10 V Input
- Step/Direction Command Input
- Encoder Input

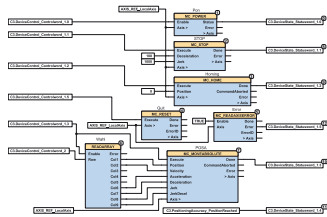
Compax3 T11: Positioning



Due to its high functionality, the Positioning version of Compax3 forms an ideal basis for many applications in high-performance motion automation.

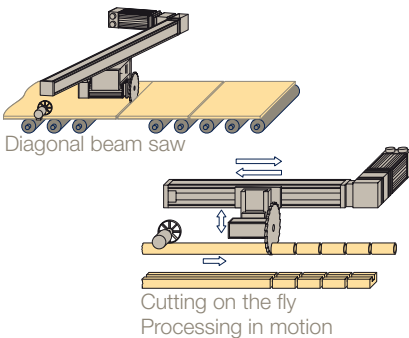
- Up to 31 motion profiles can be created with the help of the PC software
- Motion profiles can be selected via field bus or digital inputs/outputs
- Wide choice of machine zero modes simple setup / adjustable jerk limitation
- Optional extension of the digital I/Os

Compax3 T30: IIEC 61131-3 Positioning with function modules based on PLCOpen



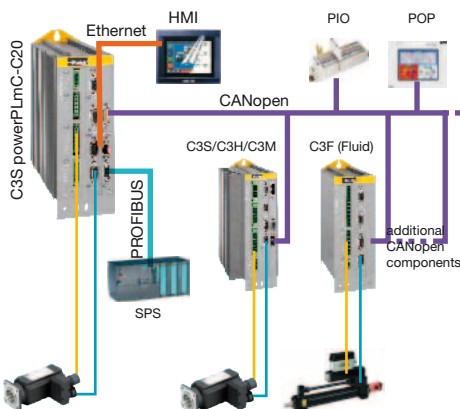
- Programming in accordance with IEC 61131-3 with CoDeSys
- up to 6000 instructions
- 650 16Bit variables / 200 32bits variables / recipe array 32 x 9
- 3 16-bit retain variables / 3 32-bit retain variables
- IEC 61131-3 standard modules/ Device specific function modules
- PLCOpen function modules

Compax3 T40: IEC 61131-3 positioning with cam function modules



- T30 Technology Functions completely integrated and available
- Master position acquisition
- Reg synchronization
- Cam switching mechanism
- Coupling and decoupling functions
- Cam profiles
- Cam memory
- Cam creation with the CamDesigner

Compax3 powerPLmC-C20: Technology controller with integrated Motion PLC



Main fields of application

- More than two axes for motion automation
- High degree of system integration (e.g. via Ethernet)
- Integration of complex devices for machine visualization and operation
- Connection to a wide number of digital and analog inputs
- Integration of pneumatic and hydraulic automation devices

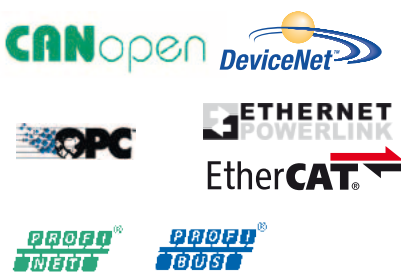
Compax3F: Hydraulics Controller

The Compax3F hydraulics controller is another member of the Compax3 family based on the well-known Compax3 digital drive. Thus, all advantages offered by the Compax3 family are now also available in servo- and proportional hydraulics. The hydraulics controller is available with the following technologies:

Technology Functions

- T11: Positioning
- T30: Motion control programmable in accordance with IEC 61131-3
- T40: Electronic cam

Communication

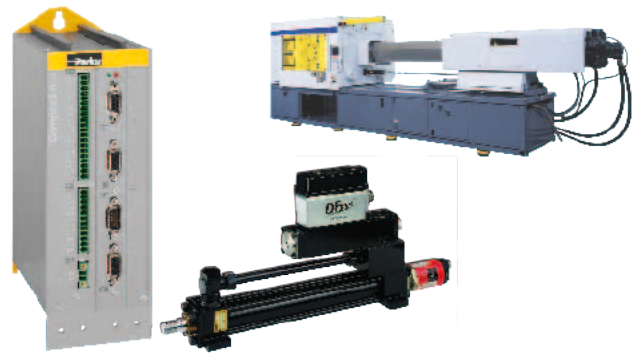


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Your Advantages:

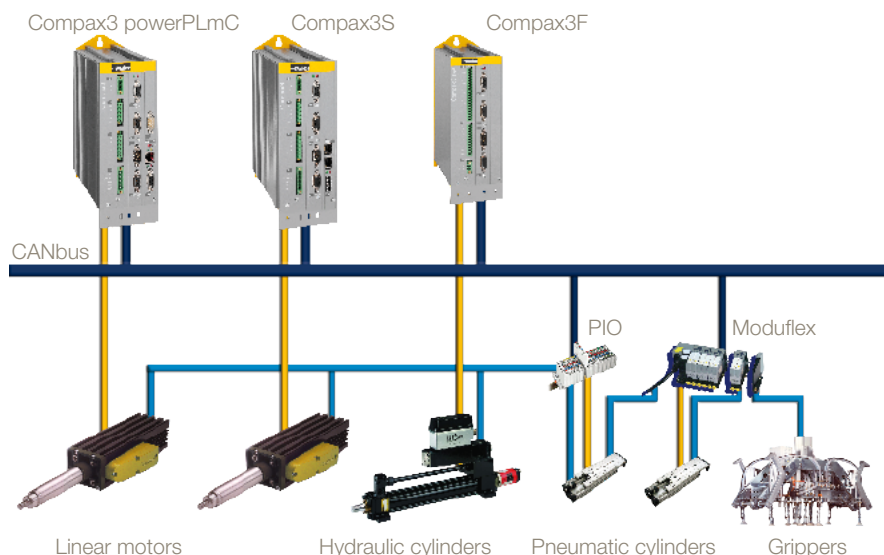
- It is no longer necessary to distinct between the motion of a hydraulic or an electromechanical axis on the control technology level .
- Common software tools for electromechanics and hydraulics supporting the design of hybrid machines.

Especially the combination with the highly dynamic DFplus valve can be used to efficiently increase your machine performance.



Device:	Compax3 F001 D2 F12 lxx Txx Mxx
Voltage supply	
Voltage range	21-27 VDC
Inputs and outputs	
8 control inputs	24 VDC / 10 kOhm
4 control outputs	Active HIGH / short-circuit proof / 24 V / 100 mA
4 analog current inputs	14 Bits
2 analog voltage inputs	14 Bits
4 analog outputs	16 Bits, current or voltage
2 analog monitor outputs	8 bits
Communication	
RS232	115200 Bauds
RS485 (2 or 4-wire)	9600, 19200, 38400, 57600 or 115200 Bauds
...	
Feedback	
	1 V _{PP} SineCosine (max. 400 Hz) RS422 Encoder (max. 5 MHz, or Step/Direction) SSI (RS422) Start/Stop (Time of Flight, RS422) EnDat2.1
Size / Weight	
H x W x D [mm]	199 x 80 x 130
Weight [kg]	2.0
Housing / protection class	Enclosed metal housing, IP20

Example: System Layout



Technical Characteristics

Technical Data

Compax3S

Type Compax3...		S025V2	S063V2	S100V2	S150V2	S015V4	S038V4	S075V4	S150V4	S300V4 ⁽¹⁾
	Unit									
Supply voltage and device currents										
Supply voltage	[V]	1*230/240 VAC (80...253 VAC) / 50...60 Hz		3*230/240 VAC (80...253 VAC) / 50...60 Hz		3*400/480 VAC (80...528 VAC) / 50...60 Hz				
Output nominal current (rms)	[A]	2.5	6.3	10	15	1.5	3.8	7.5	15	30
Peak current (<5 s)	[A]	5.5	12.6	20.0	30.0	4.5	9.0	15.0	30.0	60.0
Power rating	[kVA]	1.0	2.5	4.0	6.0	1.25	3.1	6.2	11.5	25.0
Control Voltage	[V]	24 VDC ±10 %, ripple <1 Vpp								
Electric current drain	[A]	0.8 A (Compax3) (+ digital outputs 0.1 A each + motor brake up to 1.6 A)								
Regenerative braking										
Capacity	[µF]	560	1120	780	1170	235	235	470	690	1100
Storable energy	[Ws]	15 @230 V	30 @230 V	21 @230 V	31 @230 V	37@400 V 21@480 V	37@400 V 21@480 V	75@400 V 42@480 V	110@400 V 61@480 V	176@400 V 98@480 V

⁽¹⁾ Operation with condenser module C4.

Compax3H

Models Compax3		H050V4	H090V4	H125V4	H155V4
	Unit				
Supply voltage and device currents					
Supply voltage	[V]	3*400/480 VAC (350...528 VAC) / 50...60 Hz			
Output nominal current (rms)	[A]	50.0	90.0	125.0	155.0
Peak current (<5 s)	[A]	75.0	135.0	187.5	232.5
Power rating	[kVA]	35.0	70.0	91.0	109.0
Control Voltage	[V]	24 VDC ±10 %, ripple <1 Vpp			
Electric current drain	[A]	0.8 A (Compax3) (+ digital outputs 0.1 A each + motor brake up to 1.6 A)			
Regenerative braking					
Capacity	[µF]	2600	3150	5000	5000
Storable energy	[Ws]	602@400 V 419@480 V	729@400 V 507@480 V	1158@400 V 806@480 V	1158@400 V 806@480 V

Compax3M

Models Compax3		M050D6	M100D6	M150D6	M300D6
	Unit				
Supply voltage and device currents					
Supply voltage	[V]	325...679 VDC (Rated voltage 560 VDC)			
Output nominal current (rms)	[A]	5	10	15	30
Peak current (<5 s)	[A]	10	20	30	60
Power (@ 560 VDC)	[kVA]	3.33	6.66	10	20
Regenerative braking					
Capacity	[µF]	110	220	220	440
Storable energy	[Ws]	18@400 V 10@480 V	37@400 V 21@480 V	37@400 V 21@480 V	74@400 V 42@480 V

Mains module PSUP

Mains supply:

Power Supply Model	Unit	PSUP10			PSUP20			PSUP30 ⁽¹⁾		
Supply voltage		*230...480 VAC ±10 % 50...60 Hz (Rated voltage 3*400 VAC)								
Output voltage		325...680 VDC ±10 %								
Supply voltage	[VAC]	230	400	480	230	400	480	230	400	480
Output power	[kVA]	6	10	10	12	20	20	18	30	30
Pulse power (<5 s)	[kVA]	12	20	20	24	40	40	34	60	60
Control Voltage		24 VDC ±10 %								
Maximum ripple		<1 Vpp								
Electric current drain	[A]	0.2 A			0.3 A			0.3 A		
	[A]	C3M050D6: 0.85 A		C3M100D6: 0.85 A		C3M150D6: 0.85 A		C3M300D6: 1.0 A		
		(+ total load of the digital outputs + current for motor holding brake up to 1.6 A)								

⁽¹⁾ Operation of the PSUP30 only with mains choke

Positioning

Positioning on the motor shaft	<ul style="list-style-type: none"> • Resolver (option F10) <ul style="list-style-type: none"> • Resolution: 16 Bit (= 0.005°) • Absolute accuracy: +/-0.167° • SinCos® (Option F11) <ul style="list-style-type: none"> • Position resolution: 13.5Bit/Encoder sine period => 0.03107°/encoder resolution • Direct drives (F12) <ul style="list-style-type: none"> • Maximum position resolution: <ul style="list-style-type: none"> Linear: 24 Bits per motor magnet spacing Rotary: 24 bits per motor revolution • For 1 Vpp sine-cosine encoders (e.g. EnDat): 13.5 bits / graduation of the encoder scale. For RS422 encoders: 4x encoder resolution / encoder bypass possible Accuracy of the feedback zero pulse acquisition = accuracy of the feedback resolution. For analog hall sensors with 1Vpp signal: 13.5 bits / motor magnet spacing <p>The accuracy of the position signal is above all determined by the type and exactitude of the feedback system used.</p>
Setpoint generator	<ul style="list-style-type: none"> • Jerk-limited ramps • Travel data in increments, mm, inch or variable by scale factor • Specification of speed, acceleration, deceleration and jerk
Monitoring functions	<ul style="list-style-type: none"> • Power/auxiliary supply range • Motor power stage temperature/stall protection • Following error monitoring

Supported Motor and Feedback Systems

Motors	
	<ul style="list-style-type: none"> • Sinusoidally commutated synchronous motors <ul style="list-style-type: none"> • Maximum electrical turning frequency: 1000 Hz • Maximum velocity at 8 pole motors: 15 000 min⁻¹ • Maximum speed: 60*1000/number of pole pairs in min⁻¹ • Sinusoidal commutated asynchronous motors <ul style="list-style-type: none"> • Maximum electrical turning frequency: 1000 Hz • Maximum speed: 60*1000/number of pole pairs - slip in min⁻¹ • 3 phase synchronous direct drives
Feedback systems	
	<ul style="list-style-type: none"> • Resolver (option F10) <ul style="list-style-type: none"> • Litton: JSSBH-15-E-5, JSSBH-21-P4, RE-21-1-A05, RE-15-1-B04 • Tamagawa: 2018N321 E64 • Siemens: 23401-T2509-C202 • Rotary SineCosine Single- or Multiturn encoder with Hiperface®- or EnDat 2.1 interface <ul style="list-style-type: none"> • SinCos® single-turn (Stegmann) • SinCos® - Multiturn (Stegmann), Absolute position up to 4096 motor revolutions • Rotary feedback with HIPERFACE® interface: SRS50, SRM50, SKS36, SKM36, SEK52, SEL57 • Analog hall sensors <ul style="list-style-type: none"> • Sine-Cosine signal (max. 5 V_{pp}; typical 1 V_{pp}) 90° offset • U-V signal (max. 5 V_{pp}; typical 1 V_{pp}) 120° offset • Encoder linear or rotary <ul style="list-style-type: none"> • Sine-Cosine (max. 5 V_{pp}; typical 1 V_{pp}) (max. 400 kHz) or • TTL (RS422) (max. 5 MHz) with the following modes of commutation: Automatic commutation or digital hall sensors • Digital, bidirectional interface: <ul style="list-style-type: none"> • EnDat 2.1 or EnDat 2.2 feedback systems with incremental track (sine-cosine track) • Linear or rotary • Distance coded feedback systems <ul style="list-style-type: none"> • Distance coding with 1 V_{pp} interface • Distance coding with RS422 - Interface • Feedback error compensation Automatic feedback error compensation (offset & amplification) for analog hall sensors and sine-cosine encoder can be activated in the MotorManager

Ambient Conditions

Temperature range					
	<table border="1"> <thead> <tr> <th>Compax3S & Compax3H</th> <th>PSUP / Compax3M</th> </tr> </thead> <tbody> <tr> <td>0...45 °C</td> <td>0...40 °C</td> </tr> </tbody> </table>	Compax3S & Compax3H	PSUP / Compax3M	0...45 °C	0...40 °C
Compax3S & Compax3H	PSUP / Compax3M				
0...45 °C	0...40 °C				
Tolerated humidity:					
	max. relative air humidity <=85% class 3K3;non-condensing				
Elevation of operating site					
	<ul style="list-style-type: none"> • <=1000 m asl for 100 % load ratings • <=2000 m above sea level for 1 % / 100 m power reduction • please inquire for greater elevations 				
Product Enclosure Rating					
	IP20 protection level in accordance with EN 60529				

Interfaces

COM ports	<ul style="list-style-type: none"> • RS232, 115 200 Baud • RS485, 2- or 4-wire) 9600, 19200, 38 400, 57 600 or 115 200 Bauds • USB (Compax3M), USB 2.0 Full Speed compatible
Bus systems	<ul style="list-style-type: none"> • PROFIBUS DP V0-V2 (I20), 12 Mbit/s, PROFIdrive profile drive technology • CANopen (CiADS402) (I21), 20...1000 Kbit/s, SDO1, PDO1, ... PDO4 • DeviceNet (I22), up to 32 bytes I/O, 125...500 Kbit/s, up to 63 slaves • Ethernet Powerlink (I30), 100 Mbit/s (FastEthernet), 1 ms cycle time • EtherCAT (I31), 100 Mbit/s (FastEthernet), 1 ms cycle time • PROFINET (I32), PROFINET IO (RT), 100BASE-TX (Full Duplex)
Inputs and outputs	<ul style="list-style-type: none"> • 8 control inputs: 24 VDC / 10 kOhm • 4 control outputs: Active HIGH / short-circuit proof/ 24 V / 100 mA • 2 analog inputs (14 Bit) • 2 analog outputs (8 Bit)
Encoder simulation	<ul style="list-style-type: none"> • 4-16 384 increments per revolution • Limit frequency: 620 kHz

Safety Technology

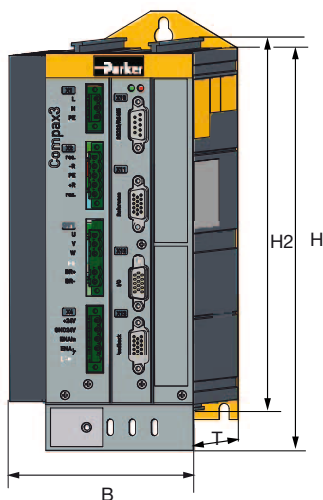
Compax3S	STO (Safe torque off) in accordance with EN ISO 13849:2008, category 3:PL=d/e. Certified: BG-PRÜFZERT
Compax3M	Optional state-of-the-art safety technology (EN ISO 13849-1:2007, category 3, PL=e)

Standards and Conformance

Insulation requirements	<ul style="list-style-type: none"> • Protection class in accordance with EN 60664-1 • Protection against human contact with dangerous voltages: in accordance with EN 61800-5-1 • Overvoltage: Voltage category III in accordance with EN 60664-1 • Level of contamination 2 in accordance with EN 60664-1 and EN 61800-5-1
CE compliance	<ul style="list-style-type: none"> • Low voltage directive 2006/95/EC EN 61800-5-1, Standard for electric power drives with settable speed; requirements to electric safety EN 60664-1, isolation coordinates for electrical equipment in low-voltage systems EN 60204-1, Machinery norm, partly applied • EC-EMC-directive 2004/108/EC EN 61800-3, product standard for speed adjustable drives
UL certification	<ul style="list-style-type: none"> • UL conform according to UL508C <ul style="list-style-type: none"> • Compax3S: Recognized Component Mark for Canada and the US • PSUP / Compax3M & Compax3H: UL Listing
RoHS compliance	Available for Compax3S, Compax3M, Compax3F Complies with European Union Directive 2002/95/EC - Restriction of Hazardous Substances (RoHS)

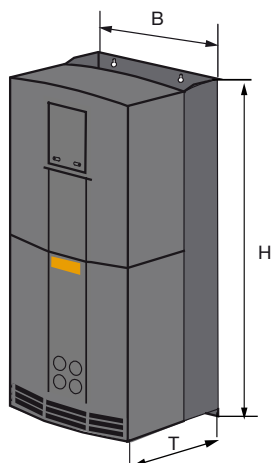
Dimensions

Compax3S



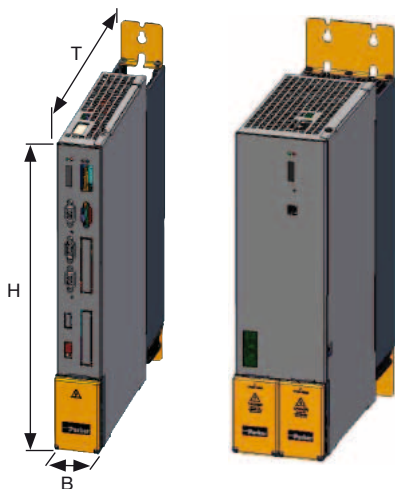
Device:	Dimensions [mm]				Weight [kg]
	H	B	T	H2	
Compax3					
S025V2	216	84	172	203	2.0
S063V2		100			2.5
S100V2		115			4.3
S150V2 / S150V4		158			6.8
S015V4	273	84	172	259	3.1
S038V4		100			3.5
S075V4		115			4.3
S300V4	380	175		391	10.9

Compax3H



Device:	Dimensions [mm]			Weight [kg]
	H	B	T	
Compax3				
H050V4	453	252	245	17.4
H090V4	669	257	312	32.5
H125V4	720	257	355	41.0
H155V4	720	257	355	41.0

PSUP & Compax3M



Device:	Dimensions [mm]			Weight [kg]
	H	B	T	
Compax3				
M050D6	360	50	263	3.5
M100D6	360	50	263	3.6
M150D6	360	50	263	3.6
M300D6	360	100	263	5.25
Power module				
PSUP10D6	360	50	263	3.95
PSUP20D6	360	100	263	6.3
PSUP30D6	360	100	263	6.3

Housing

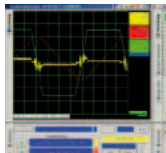
Insulation:
VDE 0160 / Protection class IP20 in accordance with EN 60 529 (not for C3H1xxV4)

Accessories and Options

Software and Tools

C3 ServoManager

- Guided configuration
 - Automatic querying of all necessary entries
 - Graphical support
- Setup mode
 - Manual motion of individual axes
 - Predefined profiles
 - Convenient operation
 - Storage of defined profiles
 - Automatic determination of the moment of inertia
- integrated 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)



MotorManager

- Complete library for Parker motors
 - Integration of customer motors
 - Determination of motor characteristics and of the motor position feedback



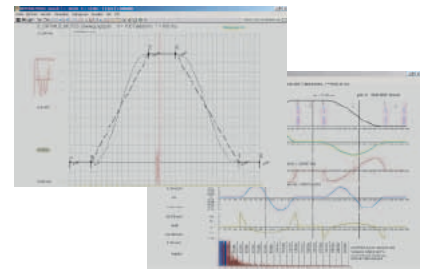
HydraulicsManager

- Valve library for Parker valves
- Integration of customer valves

CamDesigner

Cam creation tool

- Standard and expert mode
- Evaluation of the motion profiles
- Verification of the drive selection
- Transition laws from the VDI directive 2143



Programming

CoDeSys

CoDeSys is a development environment for programming that saves a significant amount of time as applications are created.

- Powerful developing environment, worldwide established
- Universal programming platform for various devices
- Complete offline simulation
- Visual elements
- Library management for user-defined applications
- Context-sensitive help wizard
- Data exchange between devices from different manufacturers
- Complete online functionality
- Sophisticated technological features
- Free of charge

IEC 61131-3

IEC 61131-3 is the only company- and product independent programming language with world-wide support for industrial automation devices.

IEC 61131-3 includes graphical and textual programming languages:

- Instruction list
- Structured text
- Ladder diagram
- Sequential function chart
- Function block diagram
- Integrated standards offer:
 - a trusted programming environment
 - standardized programming
- Integrated standards reduce:
 - the overhead of development
 - maintenance costs
 - software upkeep
 - training overhead
- Integrated standards increase:
 - productivity
 - software quality
 - concentration on core competence

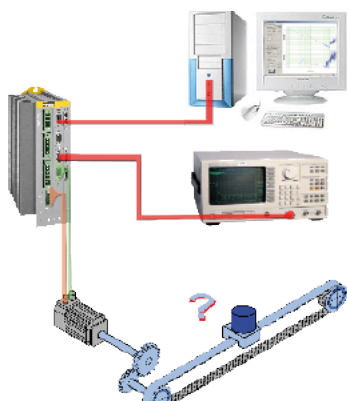
PLCopen

PLCopen is an organization that plays a significant role in supporting the IEC 61131-3 programming language. It is independent of individual companies or products. Its specific tasks also include defining basic processes relevant to motion. The PLCopen organization consists of both users and manufacturers of automation components. Parker Hannifin is an active member of the "Motion Control" task force. This represents a great advantage to users of Parker drive technology, since they are constantly able to profit directly from the latest developments in PLCopen.

Parker is a member of the "CoDeSys Automation Alliance"



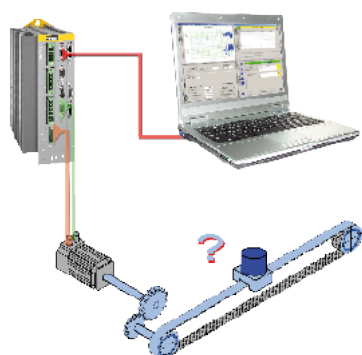
Signal Analysis for the System Identification



Formerly

Implementation prerequisites:

- Expensive and complex measurement technology required
- Special knowledge required
- Implementation only possible in an open control loop (=dangerous)



Today

Implementation prerequisites:

- Implementation with a common PC
- Simple and safe operation with the Compax3 ServoManager Software
- No special knowledge required
- The safety functions implemented in the servo drive ensure safe measurement in a closed position control loop

What purposes do the new functions serve?

Analysis and optimization of the mechanical system

Transmission behavior of the mechanic system

- Simple measurement of the mechanic dynamic behavior, therefore:
 - Possibilities to improve the mechanic construction can be spotted.
 - Increased stiffness and precision of the entire system. (improved mechanic system = improved controller performance)

Modal analysis

- Vibration analysis of the mechanic construction by specification of a sinusoidal motor force with a defined frequency.
- It is often possible to work without additional excitation by electrodynamic shakers or pulse hammers.

Analysis and optimization of the control

Transmission behavior of the mechanic system

- Better and faster controller optimization due to the knowledge of the transmission behavior of the control path.
- Specific suppression of disturbances at the mechanic resonance points with the aid of notch or low-pass filters.

Transmission behavior of the control

- Quality assessment of the control with respect to the response behavior:
 - In the time range by step response
 - In the frequency range by frequency response
 - Optimization of the control by application of stability criteria from the control theory (e.g. Nyquist criterion or Hurwitz criterion)
- Quality assessment of the control with respect to the disturbance behavior:
 - In the time range by the disturbance current - step response¹
 - In the frequency range by measurement and analysis of the resilience - frequency response²

¹ Emulation of an external volatile change in the disturbance force.

² The compliance frequency response states the size of the control deviation caused by a disturbance force depending on it's frequency.

Automation Operation and Monitoring

Parker Operator Panel - Pop

We supplies operator panels for all text and graphical applications in industrial environments.

Text and graphics-oriented Operating Systems

- Pop12
 - 4 function keys with insertable labels
 - 5 user LEDs
 - Multi-lingual projects possible
 - Connection to various bus systems
 - RS232, RS422, RS485, CL20 mA, CANopen
 - 512 kB user program memory
 - Monochrome graphics display
 - 4 lines of 20 characters for text
 - Downloadable font
 - Scalable text



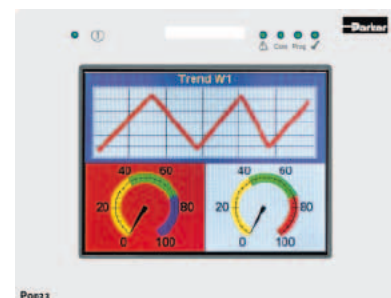
Operator panels with Graphics display

- Pop22
 - Monochrome graphics display
 - 4 lines of 20 characters for text
 - Downloadable font
 - 12 function keys with insertable labels
 - 13 user LEDs
 - Multi-lingual projects possible
 - RS232, RS422, RS485, CL20 mA, CANopen
 - 512 kB user program memory
 - 512 kB expanded memory
 - 32 kB recipe memory
 - Alarms, real-time clock, battery backup
- Pop23
 - 8 lines of 40 characters for text
 - 23 function keys
 - 24 user LEDs
 - Printer interface
 - 16 kB recipe memory
 - Alarms, real-time clock, battery backup



Visualisation with Touch-Screen

- Pop33
 - 1/4 VGA display (320x240 Pixel), 5.6" diagonal
 - 16 lines of 40 characters for text
 - Resistive touch screen
 - Can be connected to various bus systems
 - Multi-lingual projects possible
 - RS232, RS422, RS485, CL20 mA, CANopen
 - Printer interface
 - 32 kB recipe memory
 - Real-time clock, battery backup
 - Event list for alarms
 - Screensaver
 - LCD-Display STN Colour
 - 8 MB Flash memory on memory card



Order Code

Devices: Compax3

	1	2	3	4	5	6	7	8
Order example	C3	S	025 V2	F10	I10	T10	M00	

1 Device family

C3 Compax3

2 Device type

S Single axis
H High power
M Multi-axis device
F Hydraulics controller (C3F001D2F12)

3 Device currents static/dynamic; supply voltage

Compax3S

025 V2 2.5 A / 5 A; 230 VAC (single phase)
063 V2 6.3 A / 12.6 A; 230 VAC (single phase)
100 V2 10 A / 20A; 230 VAC (3 phase)
150 V2 15 A / 30 A; 230 VAC (3 phase)
015 V4 1.5 A / 4.5 A; 400 VAC (3 phase)
038 V4 3.8 A / 9 A; 400 VAC (3 phase)
075 V4 7.5 A / 15.0 A; 400 VAC (3 phase)
150 V4 15.0 A / 30.0 A; 400 VAC (3 phase)
300 V4 30.0 A / 60.0 A; 400 VAC (3 phase) ⁽¹⁾

Compax3H

050 V4 50 A / 75 A; 400 VAC (3 phase)
090 V4 90 A / 135 A; 400 VAC (3 phase)
125 V4 125 A / 187.5 A; 400 VAC (3 phase) ⁽²⁾
155 V4 155 A / 232.5 A; 400 VAC (3 phase) ⁽²⁾

Compax3M

050 D6 5.0 A / 10.0 A; 400 VAC (3 phase)
100 D6 10 A / 20 A; 400 VAC (3 phase)
150 D6 15 A / 30 A; 400 VAC (3 phase)
300 D6 30 A / 60 A; 400 VAC (3 phase)

Compax3F

001 D2 24 VDC

4 Feedback

F10 Resolver (not for C3F)
F11 SinCos© (Hiperface) (not for C3F)
F12 Encoder, Sine-cosine with/without hall

5 Interface

I10 Step/direction / analog input (only I10T10)
I11 Positioning via inputs/outputs (only I11T11)
I12 Positioning via I/Os or RS232 / RS485 / USB
I20 PROFIBUS DP V0/V1/V2 (12 Mbaud)
I21 CANopen
I22 DeviceNet
I30 Ethernet Powerlink
I31 EtherCAT
I32 PROFINET
C20 C3 powerPLmC (Multi-axis control)

6 Technology function

T10 Servo controller (only I10)
T11 Positioning
T30 Motion control programmable in accordance with IEC 61131-3
T40 Motion control programmable in accordance with IEC 61131-3 & electronic cam

7 Options

M00 No additional supplement
M10 Extension by 12 digital I/Os & HEDA Motionbus (not for T10, T11, C20)
M11 HEDA Motionbus (not for T10, T11, C20)
M12 Extension by 12 digital I/Os (not for T10, T11, C20)

8 Optional safety technology for C3M

S1 Safe torque off (furnished with the device)
S3 Extended safety technology

⁽¹⁾ Operation of the C3S300V4 with condenser module C4.
⁽²⁾ external voltage supply for ventilator fan required. Available in two versions for single phase feed. Standard: 220/240 VAC: 140 W, on request: 110/120 VAC: 130 W

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Accessories

Power module: PSUP

	1	2	3	4	5	
Order 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 mains choke
Required line choke for the PSUP30: 0.45 mH / 55 A

We offer the following mains chokes:

LCG-0055-0.45 mH

(WxDxH: 180x140x157 mm; 10 kg)

LCG-0055-0.45 mH-UL

(with UL certification, WxDxH: 180x170x157 mm; 15 kg)

Connection set for Compax3 and PSUP

Mating plug connector (furnished with the device)

	1
Order example	ZBH02/02

1 Accessories	ZBH02/01	for C3S0xxV2
	ZBH02/02	for C3S0xxV4 / S150V4 / S1xxV2
	ZBH02/03	for C3S300V4
	ZBH02/04	for C3F00xD2
	ZBH04/01	for C3M050D6, C3M100D6, C3M150D6
	ZBH04/02	for C3M300D6
	ZBH04/03	for PSUP10
	ZBH04/04	for PSUP20/PSUP030

Display and diagnostics:

Operator control module BDM01/01

- Can be plugged in while in operation
- Supply via Compax3



Operating Module

	1
Order example	BDM01/01

1 Accessories	BDM01/01	Operating module for Compax3S
----------------------	-----------------	----------------------------------

Motor cable

	1	2
Order example	MOK	55/02

1 Accessories	MOK	Motor cable ⁽²⁾
2 Type		for SMH / MH56 / MH70 / MH105 ⁽³⁾
	55/....⁽¹⁾	(1.5 mm ² ; to 13.8 A)
	54/....⁽¹⁾	1.5 mm ² ; up to 13.8 A cable chain compatible
	56/....⁽¹⁾	(2.5 mm ² ; to 18.9 A)
	57/....⁽¹⁾	2.5 mm ² ; up to 18.9 A cable chain compatible
		for MH145 / MH205 ⁽⁴⁾
	60/....⁽¹⁾	(1.5 mm ² ; to 13.8 A)
	63/....⁽¹⁾	1.5 mm ² ; up to 13.8 A cable chain compatible
	59/....⁽¹⁾	(2.5 mm ² ; to 18.9 A)
	64/....⁽¹⁾	2.5 mm ² ; up to 18.9 A cable chain compatible
	61/....⁽¹⁾	6 mm ² ; up to 32.3 A cable chain compatible
	62/....⁽¹⁾	10 mm ² ; up to 47.3 A cable chain compatible

MOK55 and MOK54 can also be used for linear motors LXR406, LXR412 and BLMA.

Feedback cable

	1
Order example	REK42/02

1 Accessories		for MH/SMH motors
	REK42/....⁽¹⁾	Resolver cable ⁽²⁾
	REK41/....⁽¹⁾	Resolver cable ⁽²⁾ cable chain compatible
	GBK24/....⁽¹⁾	SinCos© feedback cable ⁽²⁾ cable chain compatible
	GBK38/....⁽¹⁾	EnDat 2.1 feedback cable ⁽²⁾ cable chain compatible
	GBK23/....⁽¹⁾	Encoder cable ⁽²⁾
		for linear motors
	GBK33/....⁽¹⁾	Feedback cable to LXR cable chain compatible
	GBK32/....⁽¹⁾	Feedback cable to BLMA cable chain compatible

⁽¹⁾ - ⁽⁴⁾ ... see page 34



Order code for interface cables and connectors

	1
Order example	SSK01/01

1 Accessories	
SSK01/.... ⁽¹⁾	RS232 (PC-Compax3)
SSK33/.... ⁽¹⁾	USB (PC-PSUP)
SSK21/.... ⁽¹⁾	Ref / analog - with flying leads (X11, X13 @ C3F001D2)
SSK22/.... ⁽¹⁾	Digital I/Os with flying leads (X12 / X22)
SSK23/.... ⁽¹⁾	Ref /analog for I/O terminal block (X11)
SSK24/.... ⁽¹⁾	Digital I/Os for I/O terminal block (X12, X22)
SSK25/.... ⁽¹⁾	RS232 (PC-Pop)
SSK27/./.. ⁽⁶⁾	RS485 (C3-Pop for more than one C3H on request)
SSK28/.... ⁽⁵⁾	RJ45 crossover cable (C3 HEDA-HEDA, PC-C3 powerPLmC, C3M-C3M communication, PROFINET, EtherCAT, Ethernet Powerlink)
SSK29/.... ⁽¹⁾	Encoder coupling of 2 axes (X11-X11)
SSK31/.... ⁽¹⁾	Modem-Compax3 X10
SSK32/20	Adapter cable for C3H to SSK01 (15 cm furnished with the device)
VBK17/01	RS232 connection controller-programming interface (furnished with the device for C3H X10)
BUS07/01	Bus terminal connector (1st. and last C3 in the HEDA bus/or multi-axis system)
SSL01	PROFIBUS cable ⁽²⁾ not prefabricated (Length are pieces in metre)
BUS08/01	Profibus connector Plug with 2 cable inputs (1 arriving, 1 continuing PROFIBUS cable), as well as a switch for activating the terminal resistor.
SSL02	CAN Bus cable ⁽²⁾ not prefabricated; (Length are pieces in metre)
BUS10/01	CAN bus connector Plug with 2 cable inputs (1x arriving, 1x continuing CANbus cable), as well as a switch for activating the terminal resistor.

DeviceNet

A mating plug is included in the delivery. Additional information on DeviceNet wiring can be found under: www.odva.org.

Length code for cables

⁽¹⁾ Length code 1 (Example: SSK01/09 = length 25 m)

Length [m]	1.0	2.5	5.0	7.5	10.0	12.5	15.0	20.0	25.0	30.0	35.0	40.0	45.0	50.0
Order code	01	02	03	04	05	06	07	08	09	10	11	12	13	14

⁽²⁾ Colors according to DESINA,

⁽³⁾ With motor connector

⁽⁴⁾ With cable eye for motor terminal box,

⁽⁵⁾ Length code 2 for SSK28

Length [m]	0.17	0.25	0.5	1.0	3.0	5.0	10.0
Order code	23	20	21	01	22	03	05

⁽⁶⁾ Order code: SSK27/nn/..

Length A (Pop - 1st. Compax3) variable (the last two numbers corresponding to the cable length code for example SSK27/nn/01)

Length B (1st. Compax3 - 2nd. Compax3 - ... nth. Compax3) fixed 50 cm (only if there is more than 1 Compax3, i.e. nn greater than 01)

Number n (the last two digits)

Parker I/O System - PIO

	1		2
Order example	PIO	-	337

1 Series	
PIO	Parker I/O system
2 Fieldbus coupler	
337	CANopen coupler
347	CANopen coupler ECO
Bus terminals	
Digital inputs	
400	2DI 24 VDC 3.0 ms
402	4DI 24 VDC 3.0 ms
430	8DI 24 VDC 3.0 ms
Analog inputs	
456	2AI ±10 VDC differential input
468	4AI 0-10 VDC S.E.
480	2AI 0-20 mA differential input
Digital outputs	
501	2DO 24 VDC 0.5 A
504	4DO 24 VDC 0.5 A
530	8DO 24 VDC 0.5 A
Analog outputs	
550	2AO 0-10 VDC
552	2AO 0-20 mA
556	2AO ±10 VDC
System terminals	
600	Bus terminal (required as terminal for each fieldbus node)
602	Power supply terminal 24 VDC
Accessories	
PIO quick designation system (designation indicators for manual labeling)	
501	White weiß
501 gelb	Yellow
501 rot	Red
501 blau	Blue
501	Grey grau
501	Orange orange
501	Light green hellgrün



Braking resistors

	1	2
Order example	BRM	05/01

1 Accessories	
BRM	Braking resistor
2 Type	
05/01	56 Ω / 0.18 kW _{cont.} (for C3S063V2, C3S075V4)
05/02	56 Ω / 0.57 kW _{cont.} (for C3S075V4)
08/01	100 Ω / 60 W _{cont.} (for C3S025V2, C3S038V4)
10/01	47 Ω / 0.57 kW _{cont.} (for C3S150V4)
04/01	15 Ω / 0.57 kW _{cont.} (for C3S150V2, C3S300V4)
04/02	15 Ω / 0.74 kW _{cont.} (for C3S150V2, C3S300V4)
04/03	15 Ω / 1.5 kW _{cont.} (for C3S300V4)
09/01	22 Ω / 0.45 kW _{cont.} (for C3S100V2)
11/01	27 Ω / 3.5 kW _{cont.} (for C3H0xxV4)
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 C3H1xxV4, PSUP30)

Mains filter

For radio interference suppression and compliance with the emission limit values for CE conform operation.

	1	2
Order example	NFI	01/01

1 Accessories	
NFI	Mains filter
2 Type	
01/01	for C3S025V2 or S063V2
01/02	for C3S0xxV4, S150V4 or S1xxV2
01/03	for C3S300V4
02/01	for C3H050V4
02/02	for C3H090V4
02/03	for C3H1xxV4
03/01	for PSUP10 Reference axis combination 3x480 V 25 A 6x10 m motor cable length
03/02	for PSUP10 Reference axis combination 3x480 V 25 A 6x50 m motor cable length
03/03	for PSUP20, PSUP30 Reference axis combination 3x480 V 50 A 6x50 m motor cable length

Motor output choke

For disturbance suppression when the motor connecting cables are long

	1	2
Order example	MDR	01/04

1 Accessories	
MDR	Motor output choke (for Compax3S, Compax3M >20 m motor cable)
2 Type	
01/01	up to 16 A rated motor current
01/02	up to 30 A rated motor current
01/04	up to 6.3 A rated motor current

Condenser module

	1
Order example	Module C4

1 Accessories	
Module C4	Condenser module for C3S300V4

Inputs/Outputs:

Terminal block: EAM06/..

For additional wiring of the inputs/outputs:



- Can be mounted in the control cabinet via top hat rail
- Connection EAM06/.. via SSK23/.. to X11, SSK24/.. to X12

Terminal block

	1	2
Order example	EAM	06/01

1 Accessories	
EAM	Terminal block
2 Type	
06/01	I/Os without luminous indicator (for X11, X12, X22)
06/02	I/Os with luminous indicator (for X12, X22)



Compact Servo Drive - SLVD-N

Overview

Description

SLVD-N is the family of compact digital servo drives for brushless motors which, in addition to positioning applications with trapezoidal profile, electrical shaft, electronic cam, spindle orientation, simulator of stepper motor and torque control, holds a PLC inside able to talk to the most common industrial programming systems, giving a great freedom of use of the inputs and outputs. It also allows the development of additional configurations to the basic features of the drive, such as gains adjustment of the loop in relation to speed or space, torque monitoring used for tools etc.

The SLVD-N range is equipped with a serial interface RS422/RS485 allowing the operator to configure, monitoring, give commands to up to 32 units simultaneously. A CANbus interface is available both in communication mode and in real time mode with SBCCAN, DS301, DS402 protocols.

Typical applications:

- Packaging machines
- Pick & place systems
- General purpose machines

Features

- Torque/current/speed control
- Advanced manager of torque limits
- Management of speed windows
- Positioner
- Electric shaft
- Electronic cam
- Controls the motor torque with the addition of speed control
- Virtual master
- Internal PLC - programming according to IEC61131 (option)
- Configurable feedback
- Standard interface: RS422/485, CANopen
- Optional interface: EtherCAT
- Internal braking resistor
- Internal EMC filter for three phase power supply
- Safety: STO function optional



Technical Characteristics - Overview

Power supply	200...230 VAC single/three phase (±10 %) 50-60 Hz (±5 %) - only TT/TN networks
Control supply	24 VDC (-0/+10 %)
Overload	200 % for 2 s
Operating temperature	0...45 °C
Operating humidity	<85 % non condensing
Altitude	1000 m asl with 1.5 % derating every 100 m, up to 2000 m
Protections	IP20
International standards	CE, UL, cUL

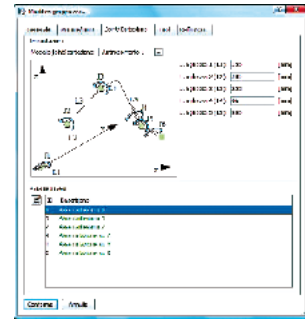
Model	Continuous current [A]	Peak current [A]	Size
SLVD1N	1.25	2.5	1
SLVD2N	2.5	5	
SLVD5N	5	10	
SLVD7N	7	14	
SLVD10N	10	20	2
SLVD15N	15	30	
SLVD17N	17	34	

Typical Applications

Industry: Robotics

Application: Painting robot

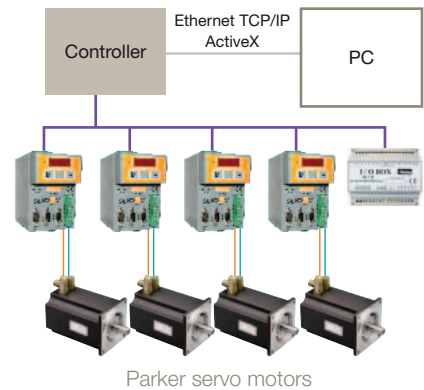
6/7 axes painting robot controlled by the SLVD-N servo drive. Full control of the machine is done with a dedicated motion controller and the remote I/O is managed over CANopen.



Industry: Glass Industry

Application: Machining Centre

A 4 axis machine (x, y, z, mandrel) executing the following operations: drilling, threading and linear milling on materials of different types. The system comprises of 4 SLVD-N and 4 SMB motors. The control of the machine is via a dedicated motion controller. The remote I/O is controlled with CANopen protocol.



Industry: Beverage Industry

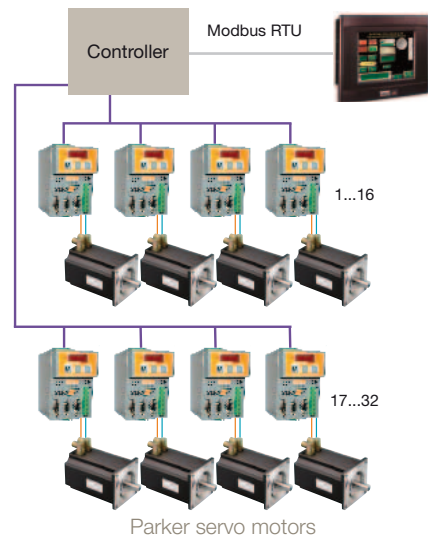
Application: Multi-head bottle capper

A multi-head machine able to cap bottles of different format. Each head, in order to reduce setup time, installs 2 SLVD-Ns, one dedicated to the vertical movement of the head depending on the carousel position and the other dedicated to the capping with preset torque. The machine is made of up to 16 heads with 2 SLVD-Ns each. The control of the machine based to a motion controller. The remoted I/O is controlled with CANopen protocol.



Multi-head bottle capper

A multi-head machine to cap bottles of different formats. Each head has 1 SLVD-N dedicated to cap fastening with torque control. The machine is made of up to 32 heads with 1 SLVD-N per head. The control of the machine based on a motion controller. The remote I/O is controlled with CANopen protocol.



Technical Characteristics

Technical Data

Model		SLVD1N	SLVD2N	SLVD5N	SLVD7N	SLVD10N	SLVD15N	SLVD17N	
	Unit								
Input and output characteristic									
Rated input current (FLA)	[A _{eff}]	1.5	2.99	5.99	8.38	11.97	17.96	20.36	
Rated output current	[A _{eff}]	1.25	2.5	5	7	10	15	17	
Peak output current (2 s)	[A]	2.5	5	10	14	20	30	34 (30@8 kHz)	
Shaft power	[kW]	0.345	0.7	1.5	2.2	3.0	4.5	5	
Continuous service installed load (power derating)	1ph [kVA]	0.85	1.5	1.5	1.8	3.0	3.3	3.3	
	3ph [kVA]	0.95	1.6	2.3	3	5.25	6.5	6.5	
Continuous service input current (power derating)	1ph [A _{eff}]	3.8	6.5	6.5	7.8	14.3	14.3	14.3	
	3ph [A _{eff}]	2.4	4.2	5.9	7.6	13.3	17.2	17.2	
Power stage dissipation	[W]	9.3	19.2	52.0	75.1	100.3	158.3	180	
Switching frequency	[kHz]	4...8						4...8	
Output frequency	[Hz]	0...450							
Dynamic braking and intermediate DC circuit									
Internal DC capacitors (±20 %)	[μF]	680			820	1800			
Braking resistor internal	[Ω]	40					16		
Peak internal braking power to 415 VDC	[kW]	4.3					10.7		
Max continuous external braking power	[kW]	1					2		
Max duty cycle (internal resistance)	[%]	1.20					1.10		

SLVD-N Features

Feedback	<ul style="list-style-type: none"> • Resolver (SLVD-N) • Encoder (SLVD-NE) • Encoder+Hall (SLVD-NH)
Auxiliary encoder input	in quadrature
Max frequency encoder input	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	<ul style="list-style-type: none"> • 4 digital inputs 0...24 V • 2 digital outputs • 1 differential analog reference ±10 V • 1 differential auxiliary analog input ±10 V • 1 analogue output single ended ±4 V
Safety technology	STO function optional - category 3 performance level in compliance with UNI EN ISO 13849-1- SIL capability 3 in compliance with CEI EN 61800-5-2, PL=e

Electrical Characteristics

Power supply

Model		SLVD-N
	Unit	Control stage
Supply voltage	[VDC]	24 V (-0...+10 %)
Max. ripple	[V _{pkpk}]	Do not go over the range
Current rating of the external power supply	[A]	1
Control electronics dissipation	[W]	15
EMC filter	-	internal
		Power stage
Mains frequency	[Hz]	50...60 ±5 %
Supply voltage (3-phase or 1-phase)	[VAC]	200...230 ±10 % (only for TT, TN mains)
DC voltage range	[VDC]	282...325 ±10 %
EMC filter	-	internal

Environmental Characteristics

Ambient conditions

Temperature range	<ul style="list-style-type: none"> Operating temperature: 3K3 class, 0...+45 °C (+32...+113 °F) Storage temperature: 1K4 class, -25 ...+55 °C (-4...+131 °F) Transportation temperature: 2K3 class, -25 ... +70 °C (-13...+158 °F)
Humidity	<ul style="list-style-type: none"> Operating humidity: 3K3 class, 5...85 % without ice and condensation Storage humidity: 1K3 class, 5...95 % without ice and condensation Transportation humidity: 2K3 class, 95 % a 40 °C
Altitude (*)	≤1000 m asl (≤3281 feet asl)
Protection degree	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

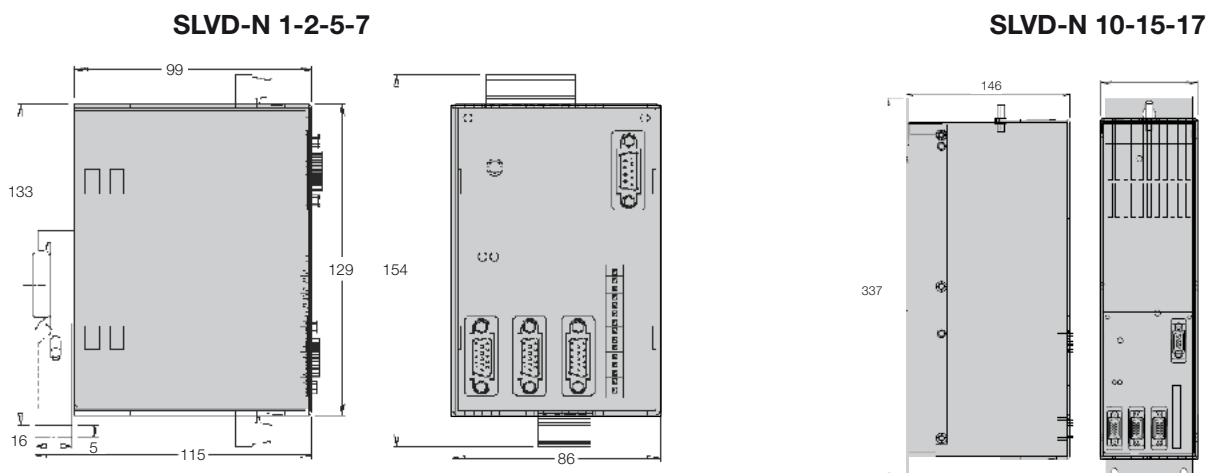
Shock and vibration

IEC60068-2-6	Frequency [Hz]	Width [mm]	Acceleration [m/s ²]
	10 ≤ f ≤ 57	0.075	-
	57 < f ≤ 150	-	9.81

Standards and Conformance

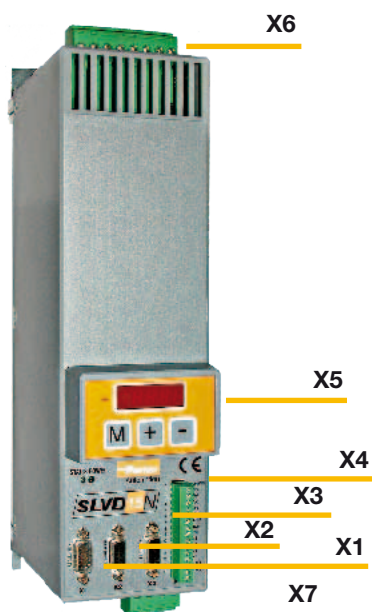
Safety standards	<ul style="list-style-type: none"> 2006/95/EC: Low voltage directive EN 61800-5-1: Adjustable speed electrical power drive systems - part 5-1: safety requirements, electrical, thermal and energy
Certification	<ul style="list-style-type: none"> UL: UL508C (USA) Power Conversion Equipment CSA: CSA22.2 Nr. 14-5 (Canada) Power Conversion Equipment
Electromagnetic compatibility	<ul style="list-style-type: none"> 2004/108/EC: EMC directive EN 61800-3: Adjustable speed electrical power drive systems - part 3: EMC requirement and specific test methods

Dimensions



Model	Height [mm]	Width [mm]	Depth [mm]	Weight [kg]
SLVD-N 1-2-5-7	154	86	115	1.1
SLVD-N 10-15-17	337	87	146	3.1

Connector Layout



X1	RS422/485 - CAN interface
X2	Encoder input/output
X3	Resolver/encoder configurable input
X4	4 digital inputs 0-24 V 2 digital outputs 1 differential analogue reference ± 10 V 1 differential aux analog input ± 10 V 1 analogue output single ended ± 4 V
X5	Optional board connector (behind the keypad)
X6	Power terminal block
X7	DC bus terminal block

Drives
SLVD-N

Accessories and Options

Keypad

SK158/L ¹⁾

Easy to use to program the functional data, control the status of the converter and send commands.



I/O Expansion Module

SK135/S

- 16 in + 8 out
- SBCCAN interface



Cables

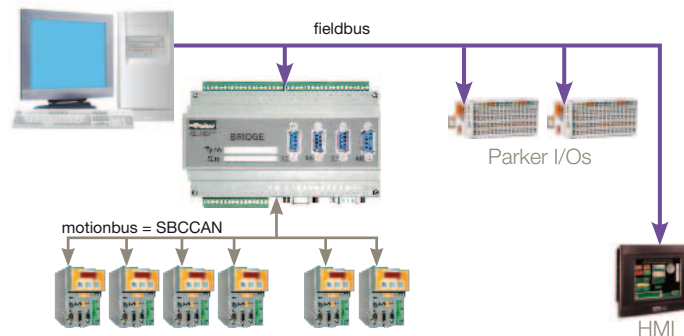
- Power and signal cables for resolver, incremental and absolute encoder and SinCos feedback
- Cable to connect a Bridge with several SLVD-N drives



Network Bridge

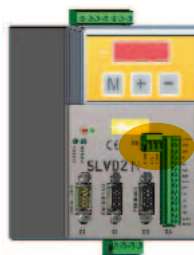
Interface protocol:

- DeviceNet
- Profibus DP



Safety Option

Option "Safe Torque off" (STO) for all SLVD-N drives available



EtherCAT Fieldbus

Applying industrial standard fieldbus systems enables the SLVD-N to be very versatile.

Option EtherCAT (E5, E6):

Feature: 1 EtherCAT option for up to 3 SLVD-N (requirement SLVD-N with EtherCAT protocol)



SLVD-N & EtherCAT box (option E5)

¹⁾ Not in combination with option E5

Software

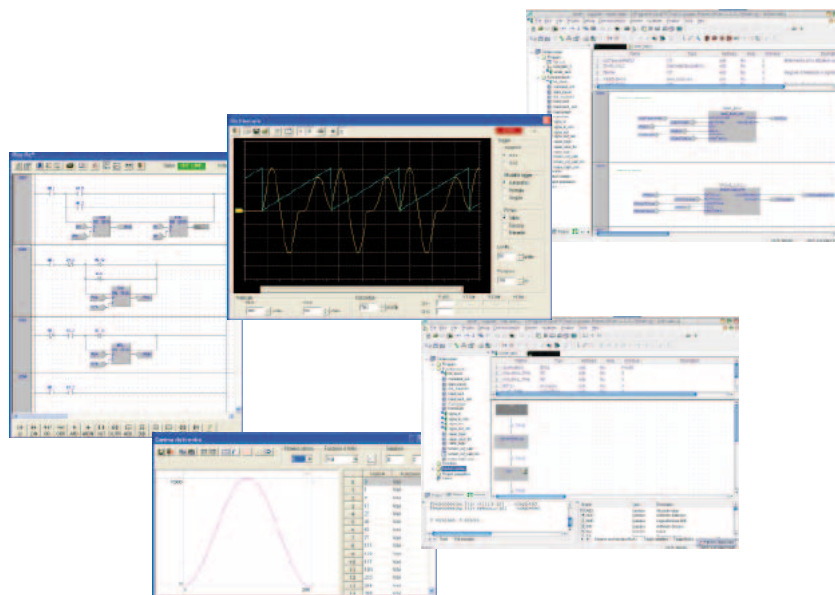
MotionWiz and LogicLab

The free MotionWiz configuration software is available to configure the SLVD-N 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 axis 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 environment programmable with standard language. PicoPLC allows the external word to communicate with the drive and to execute function sequences. Should the custom application require additional computational resources, an option software environment can be used, programmable with PLC commands according to IEC61131-3.



Order Code

Compact Servo Drive - SLVD-N

	1	2	3	4	5	6	7	8
Order example	SLVD	1	N	S	E			UL

1 Servo family	SLVD	Compact Digital Servodrive
2 Drive size (nominal current)	1	1 A
	2	2 A
	5	5 A
	7	7 A
	10	10 A
	15	15 A
	17	17 A
3 Version	N	New version
4 Protocol	S	SBCCAN protocol (standard)
	C	CANopen protocol (DS301)
	D	CANopen protocol (DS402)
	E5	EtherCAT protocol (only with optional board E5 or E6 in the bus system)

5 Encoder input	Empty field	Resolver
	E	EnDat/incremental/SinCos encoder input (from motor feedback)
	H	Incremental encoder input with Hall sensor (from motor feedback)
	F	SinCos encoder input
6 Optional boards	Empty field	without optional board
	E5	OP-ETCAT - EtherCAT option (for up to 3 SLVD-N, keypad SK158/L not possible)
	E6	E5 + keypad SK158/L (for up to 3 SLVD-N)
7 Safety	Empty field	without STO
	R	STO (Safe Torque Off function)
8 Firmware review	Empty field	without UL certification
	UL	UL certification (not for all drive sizes available, please contact your Parker partner)

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"
	DU	with Encoder Input - SBCCAN

Cables (Bridge - SLVD-N)

	1	2	3	4
Order example	CAVO	BRIDGEX	1	- 2SLVDN

1 Type	CAVO	Cable
2 Product application	BRIDGEX	Connection Bridge - SLVD-N
3 Cable length (length from Bridge to SLVD-N)	1	1 m
	1.5	1.5 m
	2	2 m
4 Number of connections/drives (min. 2, max. 8)	2SLVDN	for 2 SLVD-N
	3SLVDN	for 3 SLVD-N
	4SLVDN	for 4 SLVD-N
	4SLVDN-R	for 4 SLVD-N-R (only 1.5 m)
	8SLVDN	for 8 SLVD-N

Triple Axis Servo Drive - TPD-M

Overview

Description

TPD-M is 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 (PSU) and multiples TPD-M modules, connected through DC bus bars.

The modules are available as one, two or three axis versions. This makes the system very flexible.

The TPD-M drive has been specifically designed for the Packaging OEM market but it can also be used in many other centralized automation structures which incorporate a large number of servo axes offering significant advantages.

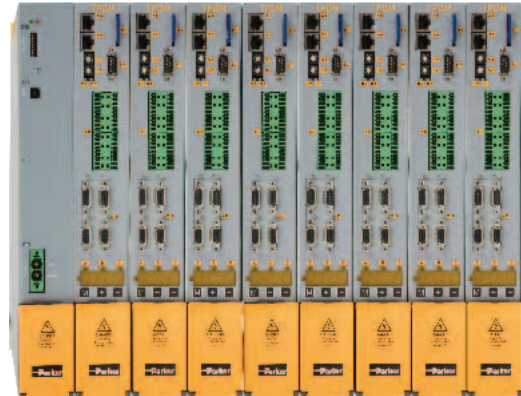
TPD-M controls also induction motors with feedback or sensorless in V/f mode.

- Packaging machines
- Material forming machines
- Textile machines
- Paper and converting lines
- Plastics machines
- Machines tools

Motion control functionality is performed by means of EtherCAT Real Time CoE (CAN over Ethernet) communication, CAN / CANopen DS402 communication.

Features

- The most compact multi-axis servo drive on the market
- Quick and simple wiring
- One, two or three axis versions combined in one housing
- Removable SD card
- Common DC bus connection for energy exchange between drives
- Feedback: Resolver, Hiperface and EnDat interface, Hall sensors, rotary and linear encoders
- New feedback: Hiperface DSL feedback ®
Reduced cabling; only one cable connection between drive & motor
- Fieldbus: CANopen - standard, EtherCAT - option
- Serial link and CAN auto-address



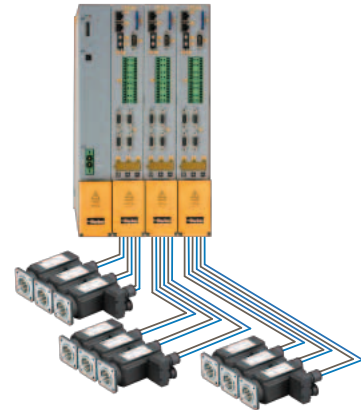
Technical characteristics - Overview

TPD Axis	Continuous current [A _{rms}]	Peak current A (≤ 2 s)
3 axis	2 + 2 + 2	4 + 4 + 4
	8 + 5 + 5	16 + 10 + 10
2 axis	2 + 2	4 + 4
	5 + 5	10 + 10
	8 + 8	16 + 16
	15 + 5	30 + 10
1 axis	5/10/15/30	10/20/30/60

TPD-M Overview

TPD-M has been developed for all applications where multiple drives are normally used and gives both OEMs and end users the opportunity to reduce build, configuration and operating costs, while boosting productivity and profitability.

Typical applications for TPD-M include packaging machines, material forming machines, textile, paper, converting and plastics machines, where large numbers of axes are required.



TPD-M system with Parker servo motors

Features and Benefits

Control cabinet space, size and cost savings

The integration of three servo power stages in a single housing offers machine builders the opportunity of having more compact control cabinets. Each TPD-M module is only 50 mm width (100 mm in the single axis 30 A version).

Reduced system complexity

The complexity of the system is significantly reduced due to the following benefits:

- Fewer components (cables, connectors, filters and braking resistors)
- Fewer communication interconnections between devices
- Centralized filtration and braking resistance

Reduce setup and maintenance costs

Due to the modular nature of TPD-M, machine design is much more straight forward. Additional axes can be added easily, simply by reproducing schemes from other existing axes. Programming time is reduced as only one drive unit needs to be configured.

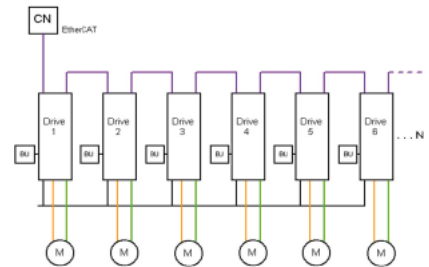
Efficient power control

TPD-M works on a common DC bus power supply that allows the system to absorb and re-supply much of the braking energy to other TPD-M 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 required.

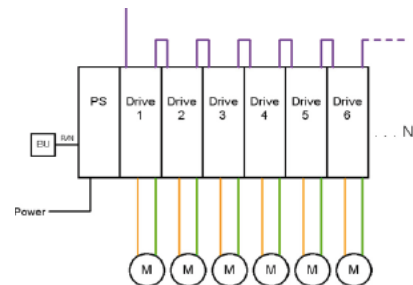
Standard Version

TPD-M servo drives is available as one, two or three axis versions. As standard TPD-M is supplied with:

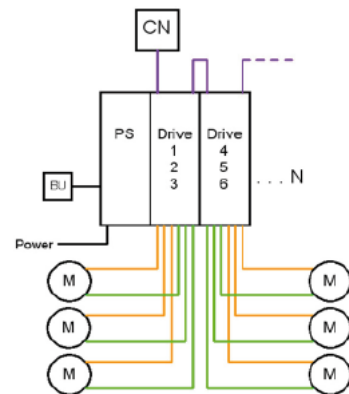
- CANopen
- STO functionality
- Digital and analog inputs/outputs
- Mechanical brake control



Traditional solution: one drive for each axis



Rack solution: one drive for each axes in a rack solution



TPD-M solution: one drive for three axis in a rack solution. Only one Power Supply

TPD-M Overview

Application

TPD-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.

- Packaging lines
- Material forming machines
- Textile machines
- Paper and converting lines
- Plastics machines
- Machine tools

Functionality

Additional features of TPD-M include an USB interface for configuration and setup plus a standard SD card interface for storing system parameters.

TPD-M can be integrated into a larger hybrid motion solution (centralized and decentralized) using Parker Motornet DC system.

Options

The capabilities of TPD-M can be further enhanced with numerous options which are available upon request, including:

- EtherCAT communication
- Hiperface DSL® feedback
- Braking resistors
- Additional inputs/outputs

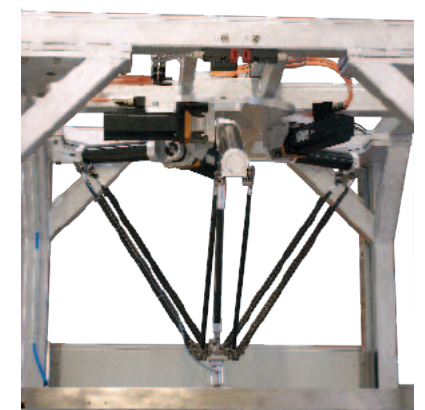
Safety technology

TPD-M supports the "Safe Torque Off" (STO) safety function in the sense of the "Safe Stop", with protection against unexpected startup according to the requirements EN ISO 13849-1 Category 3.

Together with the external safety control device, the "safe stop 1" (SS1) safety function according to the requirements of EN ISO 13849-1 category 3 can be used.

Switching off the motor torque must be effected by the machine controller.

According to a risk analysis which must be carried out according to the machine standard 89/392/EWG or EN 292; EN ISO 13849-1 and EN 1050, the machine manufacturer must project the safety system for the entire machine including all integrated components. This does also include the electrical drives.



Technical Characteristics

Technical Data

Type	3 axis	
	Unit	
Rated Output Current	[A _{rms}]	2 + 2 + 2 8 + 5 + 5
Peak Output Current (≤ 2 s)	[A]	4 + 4 + 4 16 + 10 + 10
Maximum Continuous Module Output Current	[A]	6 16 ⁽¹⁾
Maximum DC Voltage Supply		750 VDC

⁽¹⁾ The max continuous module current is clamped to 16 A

Type	Unit	2 axis				1 axis			
		2 + 2	5 + 5	8 + 8	5 + 15	5	10	15	30
Rated Output Current	[A _{rms}]	2 + 2	5 + 5	8 + 8	5 + 15	5	10	15	30
Peak Output Current (≤ 2 s)	[A]	4 + 4	10 + 10	16 + 16	10 + 30	10	20	30	60
Maximum Continuous Module Output Current	[A]	4	10	16	30	5	10	15	30
Maximum DC Voltage Supply		750 VDC							

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
Peak Output 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.

Environmental Characteristics

Type	TPD-M	PSUP
Operating Temperature	0...+40 °C	
Storage Temperature	-25 °C...+55 °C	
Shipping Temperature	-25 °C...+70 °C	
Product Enclosure Rating	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	
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	IEC60068-2-6 10...57 Hz width 0.075 mm 57...150 Hz accel. 9.81 m/s ²	

TPD-M Features

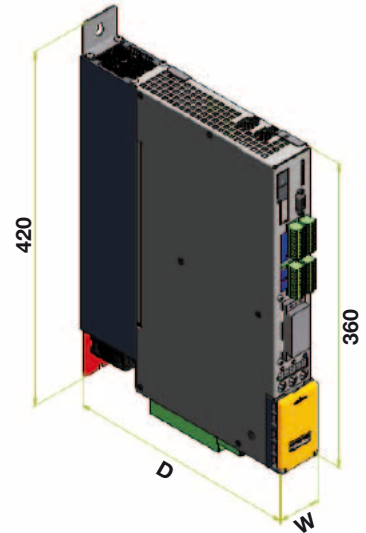
Communication	<ul style="list-style-type: none"> • via USB port
Networks and Bus Systems	<ul style="list-style-type: none"> • CANopen, 20...1000kbit/s, SDO1, PDO1...PDO4 • EtherCAT, 100Mbit/s, 1 ms cycle time • Via Gateway <ul style="list-style-type: none"> • Profibus • DeviceNet
Inputs / Outputs	<ul style="list-style-type: none"> • 4 digital input, • 2 digital output, • 1 analog input • 1 analog output for each axes. • 1 incremental encoder input, • 1 incremental encoder output • Additional I/O <ul style="list-style-type: none"> • 3 analogue inputs 12bit, • 2 incremental encoder input, • 2 incremental encoder output • Auxiliary Encoder
Supported Feedback	<ul style="list-style-type: none"> • Resolver, • SinCos, • SinCos + EnDat, • SinCos + Hiperface, • SinCos (1 per pole pitch), • Quadrature, • Quadrature + Hall, • SinCos + Hall, • Hiperface DSL®
Programming / Configuration	<ul style="list-style-type: none"> • PicoPLC • MotionWiz with Oscilloscope function, real time and debugging features • Removable SD card for <ul style="list-style-type: none"> • software upgrade, • parameters and • application memory
Technology Functions	<ul style="list-style-type: none"> • Torque control • Speed control • Position control • Electronic gearbox • Camming
Safety Functions	<ul style="list-style-type: none"> • 1 Safety Torque Off circuit for 3 axis module • 2 independent Safety Torque Off circuit for 2 axis module • 1 Safety Torque Off circuit for 1 axis module

Standards & Conformance

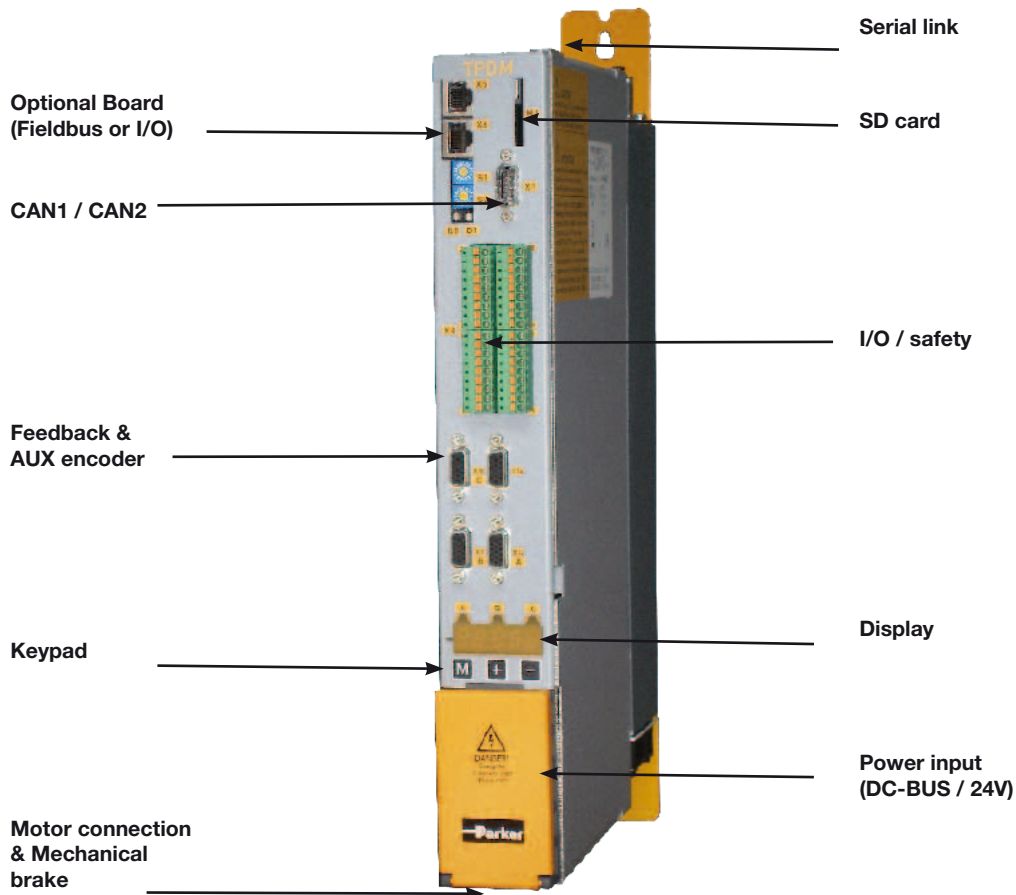
2006/95/EC	Low voltage directive
EN 60204-1	Safety of machinery - Electrical equipment of machines - Part 1: General requirements
EN 61800-5-1	Adjustable speed electrical power drive systems - safety requirements, thermal and energy
UL508C	(USA) Power Conversion Equipment
2004/108/EC	EMC directive
EN 61800-3	Adjustable speed electrical power drive systems - Part 3: EMC product standard including specific test method

Dimensions

Type	W [mm]	D [mm]	Weight [kg]
TPD-M 1/2/3 axes	50	270	4.3
TPD-M single axis 30 A	100	270	8.6
PSUP10	50	270	3.6
PSUP20 / PSUP30	100	270	5.4



Connector Layout



Accessories and Options

Hiperface DSL® Feedback

Description

The Single Cable Servo Drive System from Parker is a combination of the low inertia servo motor SME and the triple axis servo drive TPD-M based on the Hiperface DSL® digital feedback technology. The encoder feedback communication is fully integrated into the motor power cable and thus no separate feedback cable between drive and motor is required.

The new feedback system is a purely digital encoder communication protocol with exceptional performance. The absolute position determination, a resolution of up to 20 bit per turn, as well as 4096 maximum rotations, is unique in it's class.

The System is completed by the multi-axis servo drive TPD-M which represents one of the most compact solutions on the market giving the possibility of controlling up to three single cable SME servo motors with one 50 mm drive module.

Therefore, the Single Cable Servo Drive System from Parker is a bespoke solution to provide machine builders with lower cabling and installation cost and the possibility to reduce control panel size and machine footprint.



TPD-M triple axis servo drive connected to SME motors via Hiperface DSL® interface: One cable per servo motor instead of two.

Feedback-Features

- **One cable connection between drive and motor instead of two**
- **No need for separate feedback cable and connector**
- **Fully digital and interference-free communication**
- **Synchronous, bidirectional, multi-channel**
- **Easy setup and reduced wiring**

Applications

- **Packaging Machinery**
- **Material Handling**
- **Machine Tools**
- **Robotics**
- **Paper & Converting**

Configuration Software - MotionWiz

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

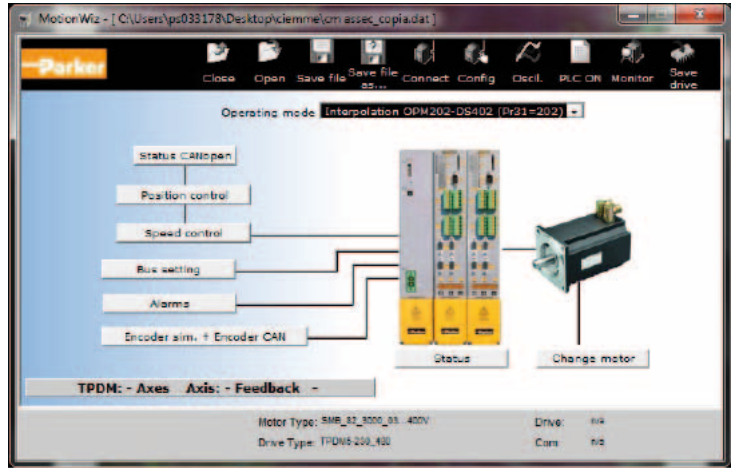
MotionWiz features an intuitive, easy and simple to use Windows® style environment to aid installation, optimisation and diagnostic use.

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.

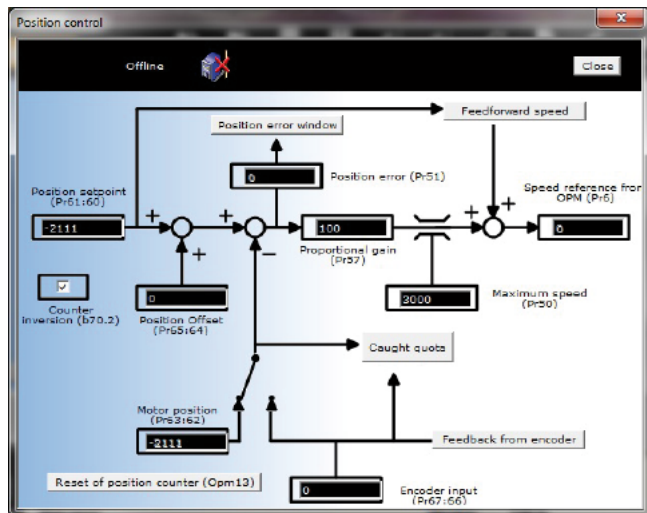
To simplify the configuration of systems with a large number of similar axes but with different motion profiles, MotionWiz allows users to copy the configuration from one application to another.

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

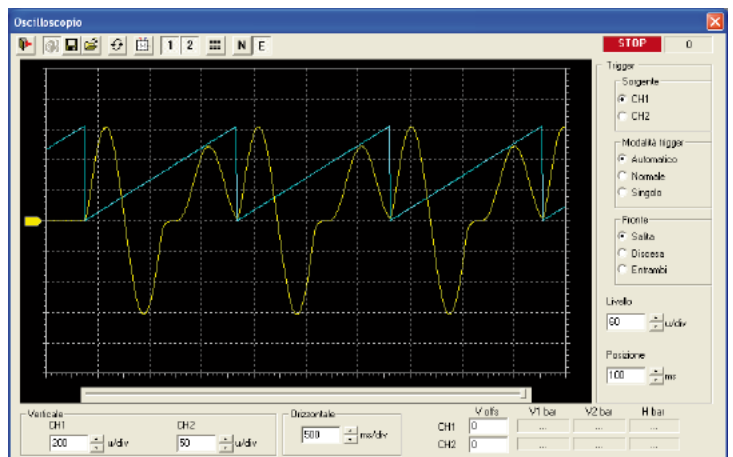
MotionWiz can be downloaded at www.parker.com/eme/tpdm



MotionWiz: General settings



MotionWiz: Position control



MotionWiz Oscilloscope: Real speed & torque trends

Order Code

TPD-M System

	1	2	3	4	5	6	7
Order example	TPD	M	02 02 02	D	L	E5	G

1 Drive Family	TPD	Triple Power Drive
2 Axes	M	Multi Axis
3 Drive Size	02 02 02	3 axis 2 A + 2 A + 2 A
	08 05 05	3 axis 8 A + 5 A + 5 A
	02 02	2 axis 2 A + 2 A
	05 05	2 axis 5 A + 5 A
	08 08	2 axis 8 A + 8 A
	15 05	2 axis 15 A + 5 A
	5	single axis 5 A
	10	single axis 10 A
	15	single axis 15 A
	30	single axis 30 A
4 Fieldbus	D	CANopen
5 Feedback system	Empty field	Resolver
	E	EnDat / Incremental / SinCos encoder
	H	Incremental encoder + Hall sensors
	L	DSL feedback
6 Option board	Empty field	No option
	E5	EtherCAT option board
	E7	Analogic expansion board
7 Accessories	G	Fixing shield

Mains module: PSUP

	1	2	3	4	5
Order example	PSU	P	10	D6	USB M00

1 Device family	PSU	Power module
2 Device typ	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

We offer the following line chokes:

LCG-0055-0.45 mH (WxDxH: 180 mmx140 mmx157 mm; 10 kg)

LCG-0055-0.45 mH-UL (with UL certification)

(WxDxH: 180 mmx170 mmx157 mm; 15 kg)

Capacitor module

	1	2
Order example	PSC	023 M00

1 Accessories	PSC	Capacitor module
2 Type	023 M00	23 µF no additional supplement
	047 M00	47 µF no additional supplement
	068 M00	68 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

Motor output choke

For disturbance suppression when the motor connecting cables are long.

	1	2
Order example	MDR	01/04

1 Accessories	MDR	Motor output choke (for TPD-M >20 m motor cable)
2 Type	01/01	up to 16 A rated motor current
	01/02	up to 30 A rated motor current
	01/04	up to 6.3 A rated motor current

Other Accessories

Order Code	Description
Motionwiz	Programming Software
Exp-Ground	Fixing shield assembly
USBTODRIVE	USB to RS232/422 converter with cable

Brushless Servomotor with Integrated Servo Drive - Motornet DC

Overview

Description

Motornet DC is a brushless servomotor 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.

- **Packaging Machines**
- **Rotary Tables**
- **Filling, bottling and capping machines**

Motion control functionality is executed by means of EtherCAT communication or optionally CANopen DS402 communication.

Features

- **Feedback: Resolver / EnDat (optional)**
- **Fieldbus: EtherCAT**
- **2 digital Inputs / 2 digital Outputs**
- **Protection level: IP64 standard, IP65 / IP67 (optional)**
- **STO (optional)**
- **CAN Service Bus**



Technical Characteristics - Overview

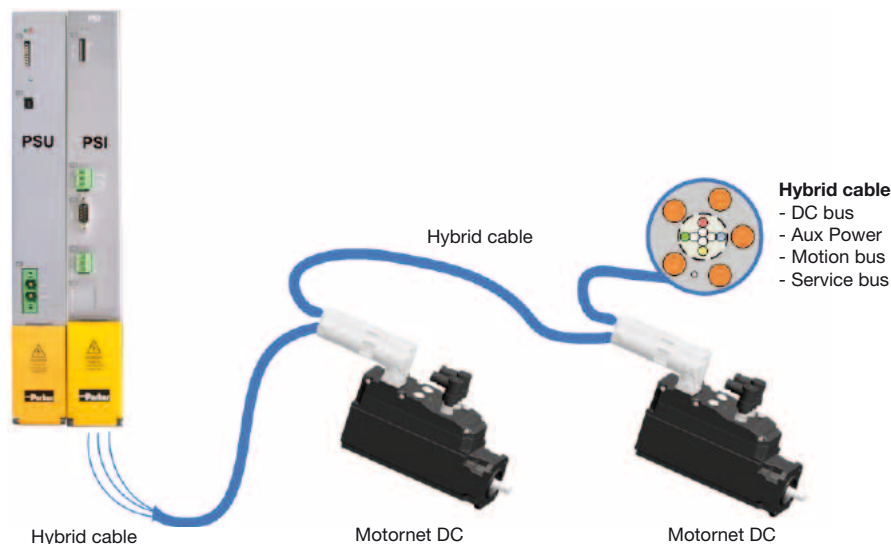
230 VAC supply

		Size		
		MDC60	MDC70	MDC100
Speed 3000 min ⁻¹	Stall torque [Nm]	1	2.5	6.5
	Peak torque [Nm]	4	11	15
Speed 6000 min ⁻¹	Stall torque [Nm]	0.9	1.9	-
	Peak torque [Nm]	4	7	-
Inertia without brake [kgmm ²]		30.2	100	504

400 VAC supply

		Size		
		MDC60	MDC70	MDC100
Speed 3000 min ⁻¹	Stall torque [Nm]	1	2.6	7.5
	Peak torque [Nm]	4	11	26.7
Speed 5200 min ⁻¹	Stall torque [Nm]	-	-	5.7
	Peak torque [Nm]	-	-	15
Speed 6000 min ⁻¹	Stall torque [Nm]	0.9	2.2	-
	Peak torque [Nm]	4	7	-
Inertia without brake [kgmm ²]		30.2	100	504

Typical System Architecture



Motornet DC System

Description

The next logical evolution in machine motion control, Motornet DC integrates servo control electronics into a brushless servomotor creating a self-contained motor and servo controller. This offers considerable benefits in terms of machine design by allowing a decentralised motion control architecture to be used. This in turn allows substantial savings in time and materials to be realised, while reducing machine footprints.

Typical applications for Motornet DC include packaging machines and rotary tables where numerous motors are mounted on the machine.



Motornet DC

Features and Benefits

Quick and simple machine configuration and reduced wiring

The hybrid cabling solution, which contains all power supply, control and communications signalling offers machine builders a number of benefits including:

- Simplified plug and socket connections at the motor
- Reduced number of connections and potential points of failure
- Reduced wiring time and cost of associated cabling

Reduced machine footprint

With a power supply and PSI 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.

Modular machine design

Because of the modular nature of Motornet DC, machine design becomes very easy. Additional axes can be added with very little 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.

Efficient power control

Motornet DC works on a common DC bus power supply that allows the system to share much of the braking energy to other Motornet DC units rather than dissipating it in the form of heat via external resistors. In some instances, the resistor can be removed completely and in others a smaller resistor is required.



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

Application

Motornet DC is ideally suited to applications where a number of motors are mounted in close proximity on a machine, such as a filling machine. In this case, the reduced cabling and electronics allow a much smaller physical footprint for the machine to be developed. Motornet DC is suited to packaging lines in general as the plug and play nature of its cable architecture allows new machine modules to be easily added or removed without considerable rewiring cost being incurred.

- **Packaging lines**
- **Rotary tables**
- **Filling, bottling and capping machinery**



Functionality

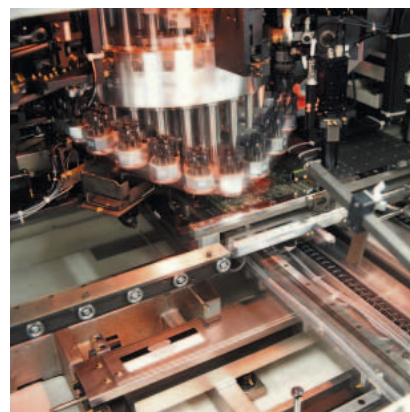
Motornet DC offers full motion control and is designed to complement the existing Parker servo drive and motor product range. Being flexible in its configuration, Motornet DC can be used to provide repeatable and accurate motion control for a wide range of applications and can be integrated into a larger hybrid motion solution.



Standard Version

Available in flange sizes of 60 mm, 70 mm and 100 mm with continuous torque ratings of 0.9 to 7.5 Nm and motor speeds up to 6000 min⁻¹. Motornet DC can be configured to suit the needs of any number of applications with a range of options. As standard Motornet DC is supplied with:

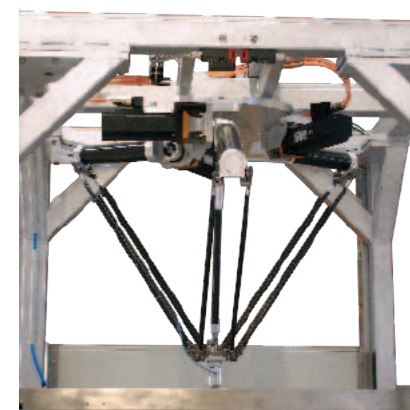
- **EtherCAT**
- **Localised I/O - 2 digital inputs and 2 digital outputs**
- **Resolver feedback**
- **CAN Service Bus**



Options

The capabilities of Motornet DC can be further enhanced with numerous options which are available upon request, including:

- **IP65 protection for harsh environments**
- **Safe Torque Off (STO) functionality**
- **CANopen DS402 communication in place of EtherCAT**
- **Encoder feedback**
- **Holding brake**



Technical Characteristics

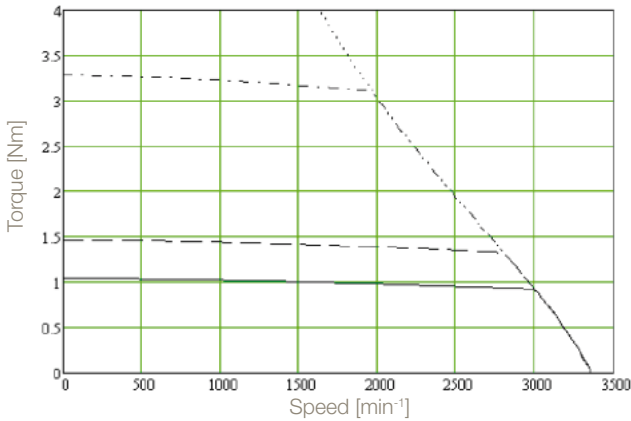
General Characteristics

Type	AC Voltage Power Supply [VAC]	Speed [min ⁻¹]	Rated torque [Nm]	Rated power [W]	Cont. stall torque [Nm]	Peak torque [Nm]	Peak power [W]	Inertia (without brake) [kgmm ²]
MDC60	230	3000	0.90	314	1.0	4.0	1257	30.2
		6000	0.55	384	0.9	4.0	2513	
	400	3000	0.90	314	1.0	4.0	1257	
		6000	0.55	384	0.9	4.0	2513	
MDC70	230	3000	2.00	698	2.5	11.0	3456	100
		6000	0.50	620	1.9	7.0	4398	
	400	3000	2.00	698	2.6	11.0	3456	
		6000	0.50	698	2.2	11.0	6911	
MDC100	230	3000	4.40	1535	6.5	15.0	4712	504
		3000	4.40	1535	7.5	26.7	8388	
	5200	1.00	1536	5.7	15.0	8168		

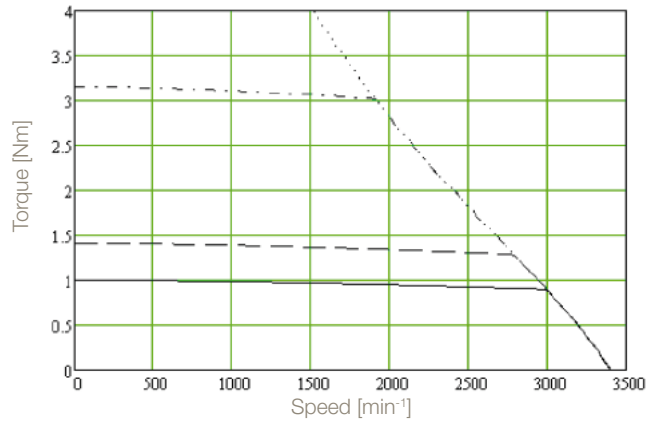
Data refer to MDC mounted in horizontal position to allow for free convection , at 40 °C ambient temperature.

Motornet DC - Torque vs Speed Characteristic Curves

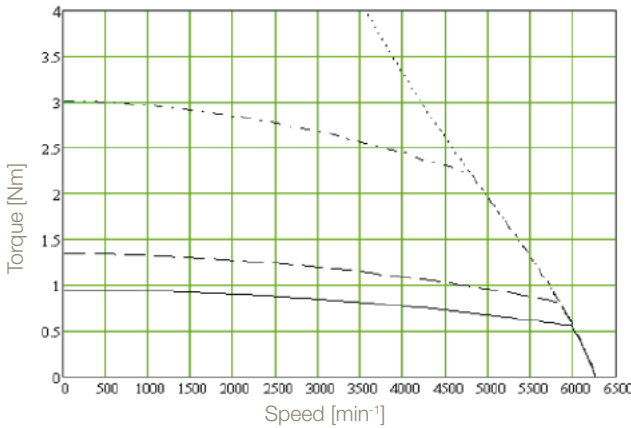
MDC60 - 3000 min⁻¹ 230 VAC



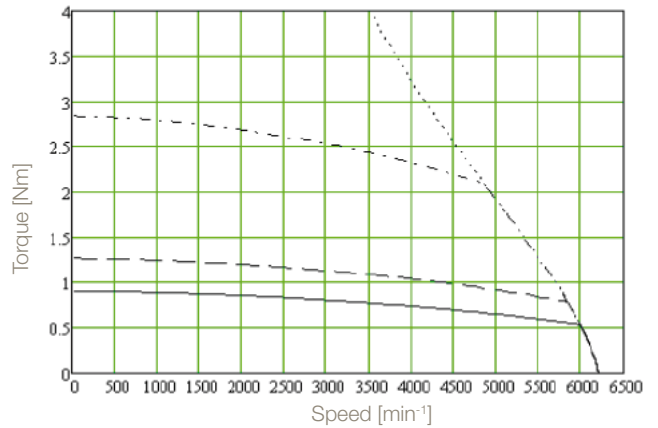
MDC60 - 3000 min⁻¹ 400 VAC



MDC60 - 6000 min⁻¹ 230 VAC



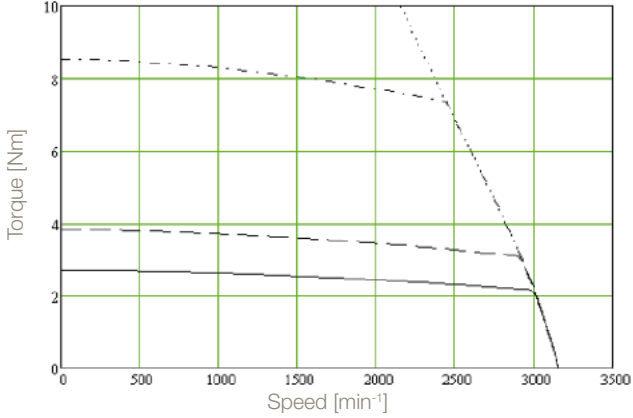
MDC60 - 6000 min⁻¹ 400 VAC



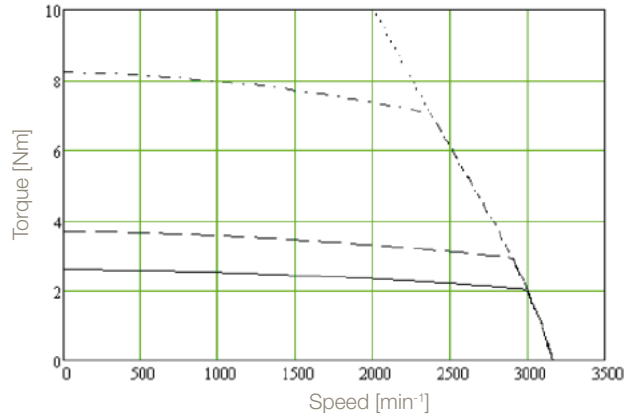
Key

- Voltage Limit
- S1 60 K ΔT
- - S3 50 %
- · S3 10 %

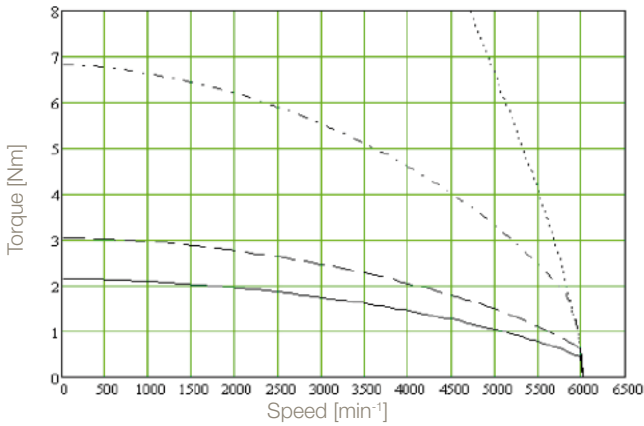
MDC70 - 3000 min⁻¹ 230 VAC



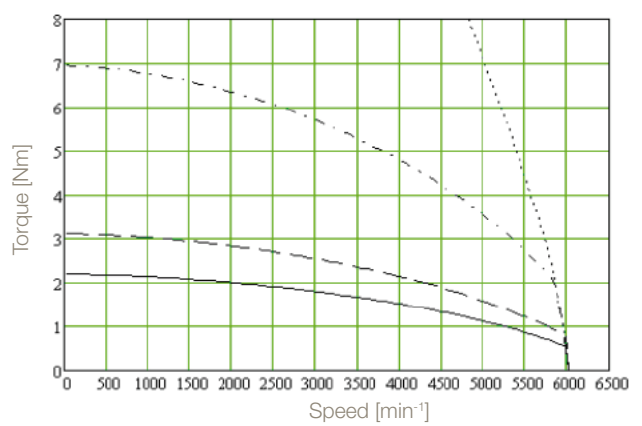
MDC70 - 3000 min⁻¹ 400 VAC



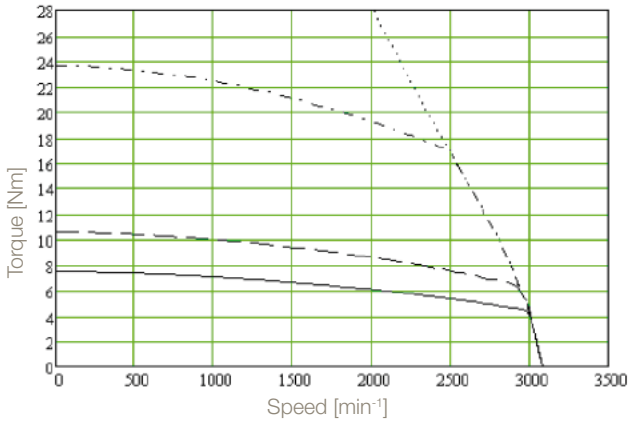
MDC70 - 6000 min⁻¹ 230 VAC



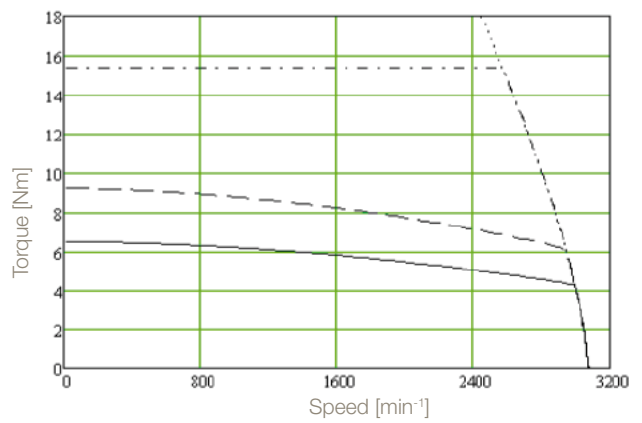
MDC70 - 6000 min⁻¹ 400 VAC



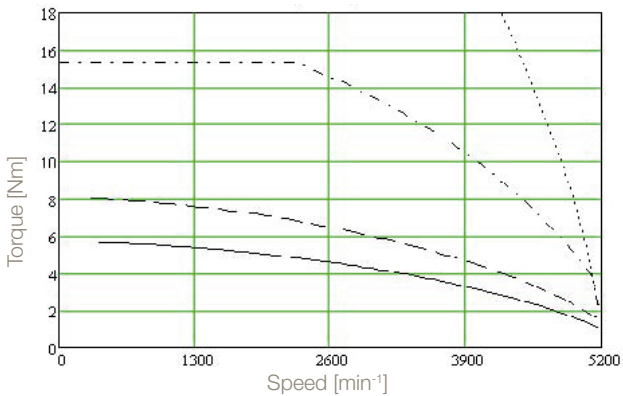
MDC100 - 3000 min⁻¹ 400 VAC



MDC100 - 3000 min⁻¹ 230 VAC



MDC100 - 5200 min⁻¹ 400 VAC



- Key**
- Voltage Limit
 - S1 60 K ΔT
 - - S3 50 %
 - · S3 10 %

Electrical Characteristics

MDC - Motornet DC

Motornet DC Model		MDC60	MDC70	MDC100
	Unit			
Auxiliary Voltage Supply				
Rated Input Voltage	[V]	24...48 VDC (0...+10 %)		
Maximum Input Current ¹⁾	[A]	20		
Control Stage Input Power	[W]	12		
Power Stage Voltage				
Maximum DC Voltage Supply	[V]	750 VDC		

¹⁾ This is the maximum rated input current that may be supplied to the overall MDC branch. To calculate the maximum number of MDC units that can be connected in a single branch without exceeding this value, the user must also consider the input braking current.

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 Motornet 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	

Environmental Characteristics

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

Temperature			
<ul style="list-style-type: none"> Operating Temperature: 0...+40 °C Storage Temperature: -25...+55 °C Shipping Temperature: -25...+70 °C 			
Product Enclosure Rating			
	Motornet DC	PSUP	PSI
	IP64, IP65 / IP67 as option	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			
<ul style="list-style-type: none"> 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			
	Motornet DC	PSUP	PSI
	3M1 Class 2...9 Hz width 0.3 mm 9...200 Hz accel. 1 m/s ²	IEC60068-2-6 10...57 Hz width 0.075 mm 57...150 Hz accel. 9.81 m/s ²	

Standards & Conformance

Motornet 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
EN 60034-1	Rotating electrical machines - Part 1: Rating and performances
EN 60034-5	Rotating electrical machines. Part 5: Degrees of protection provided by the integral design of rotating electrical machines (IP code) - Classification

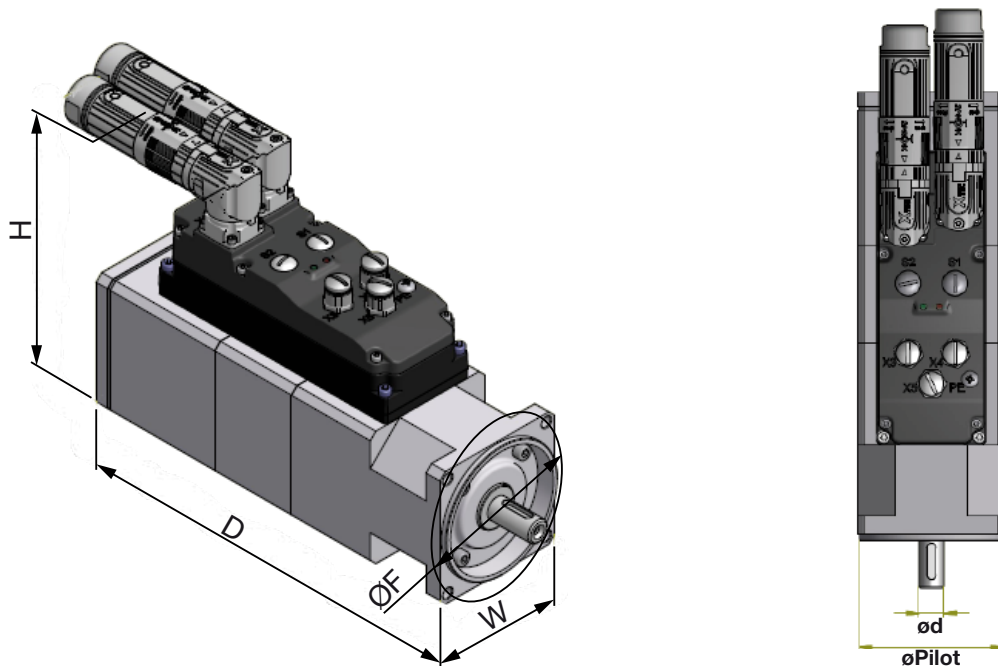
PSUP - Power Supply Unit and PSI - Power Supply Interface for Motornet DC

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

Dimensions

Motornet DC

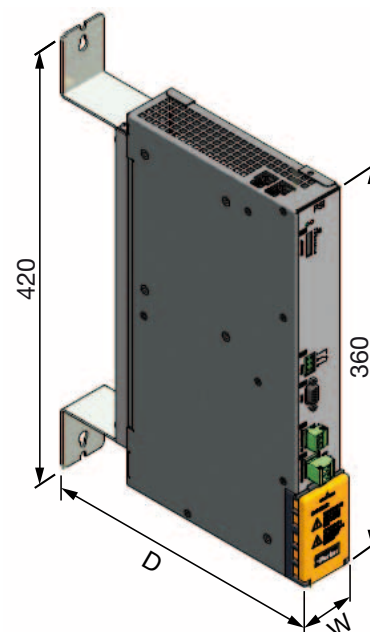
Drives
 Motornet DC



Type	Flange	H [mm]	W [mm]	D [mm]	ød x length [mm]	øPilot [mm]	F [mm]	Weight [kg]
MDC60	5	154	70	192	9x20 / 11x 23	60	75	2.7
	8		60			40	63	
MDC70	5	164	70	287	11x23 / 14x30 / 19x40	60	75	5.2
MDC100	5	194	100	262	19x40 / 24x50	95	115	8.6
	8					80	100	

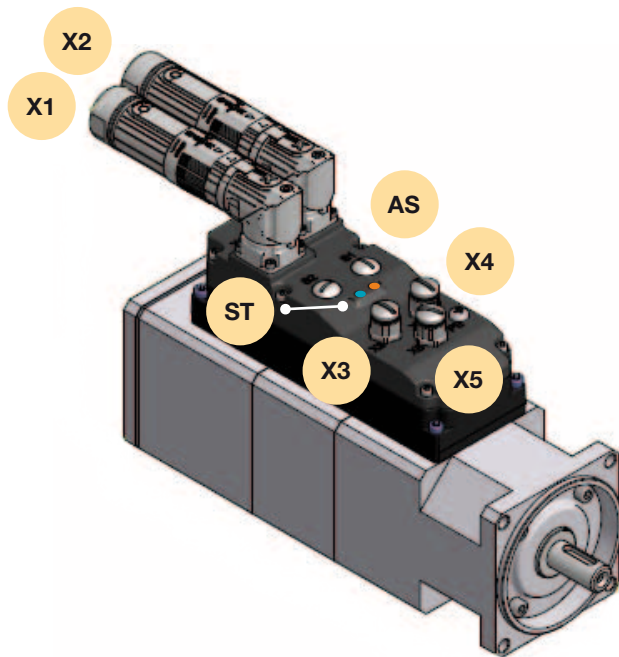
PSU - Power Supply Unit and PSI - Power Supply Interface for Motornet DC

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



Connector Layout

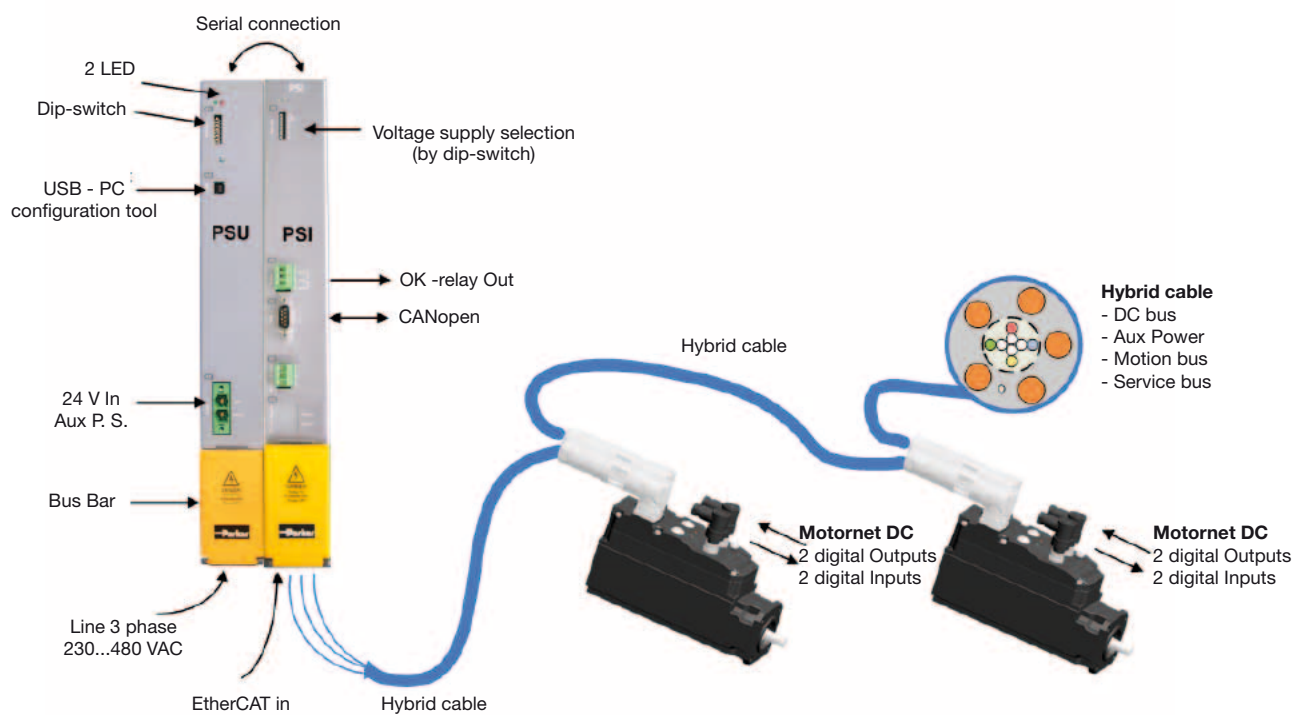
Motornet DC



Key	Description
X1	IN: DC Bus, 24 VDC Supply, Motion Bus, Service Bus
X2	OUT: DC Bus, 24 VDC Supply, Motion Bus, Service Bus
X3	Digital Inputs
X4	Digital Outputs
X5	I/O STO, RS232
AS	Address setting selector switches
ST	Status LEDs: Green - Power On, Red - Status

Typical Connection Diagram

Motornet DC



Accessories

Configuration Software - MotionWiz

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

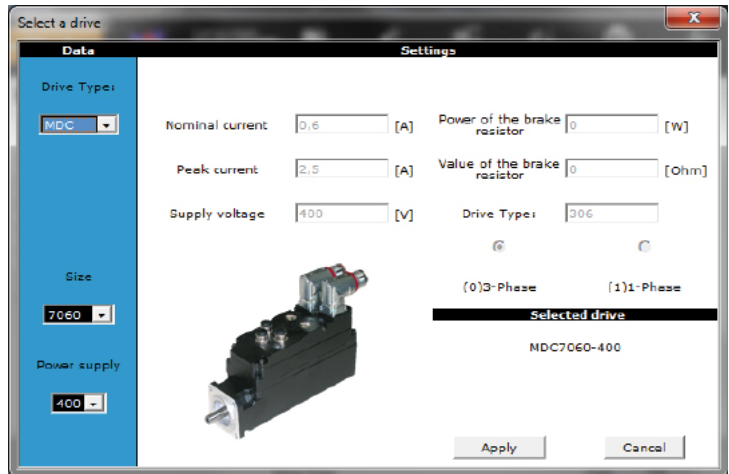
MotionWiz features an intuitive, easy and simple to use Windows® style environment to aid installation, optimisation and diagnostic use.

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.

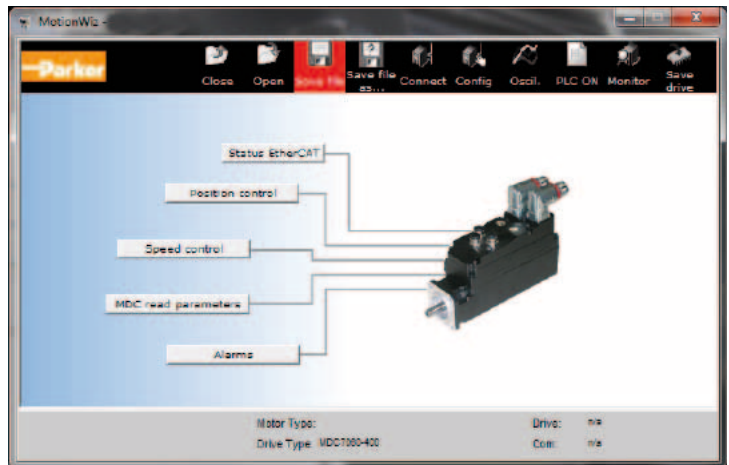
To simplify the configuration of systems with a large number of similar axes but with different motion profiles, MotionWiz allows users to copy the configuration from one application to another.

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

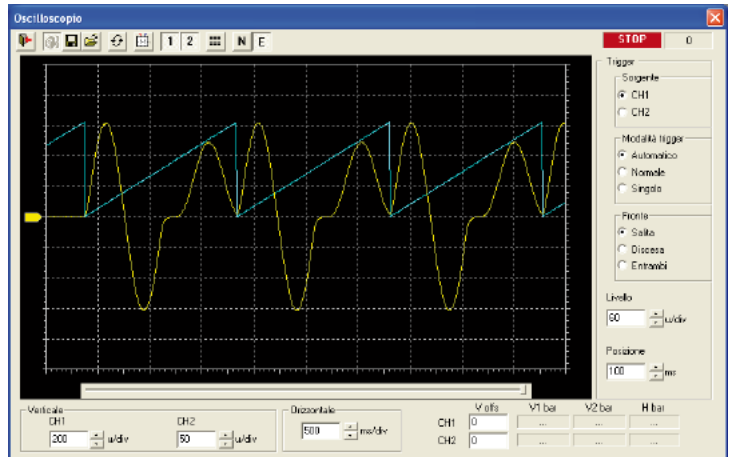
MotionWiz can be downloaded at www.parker.com/eme/motornet



MotionWiz: Motor's size selection

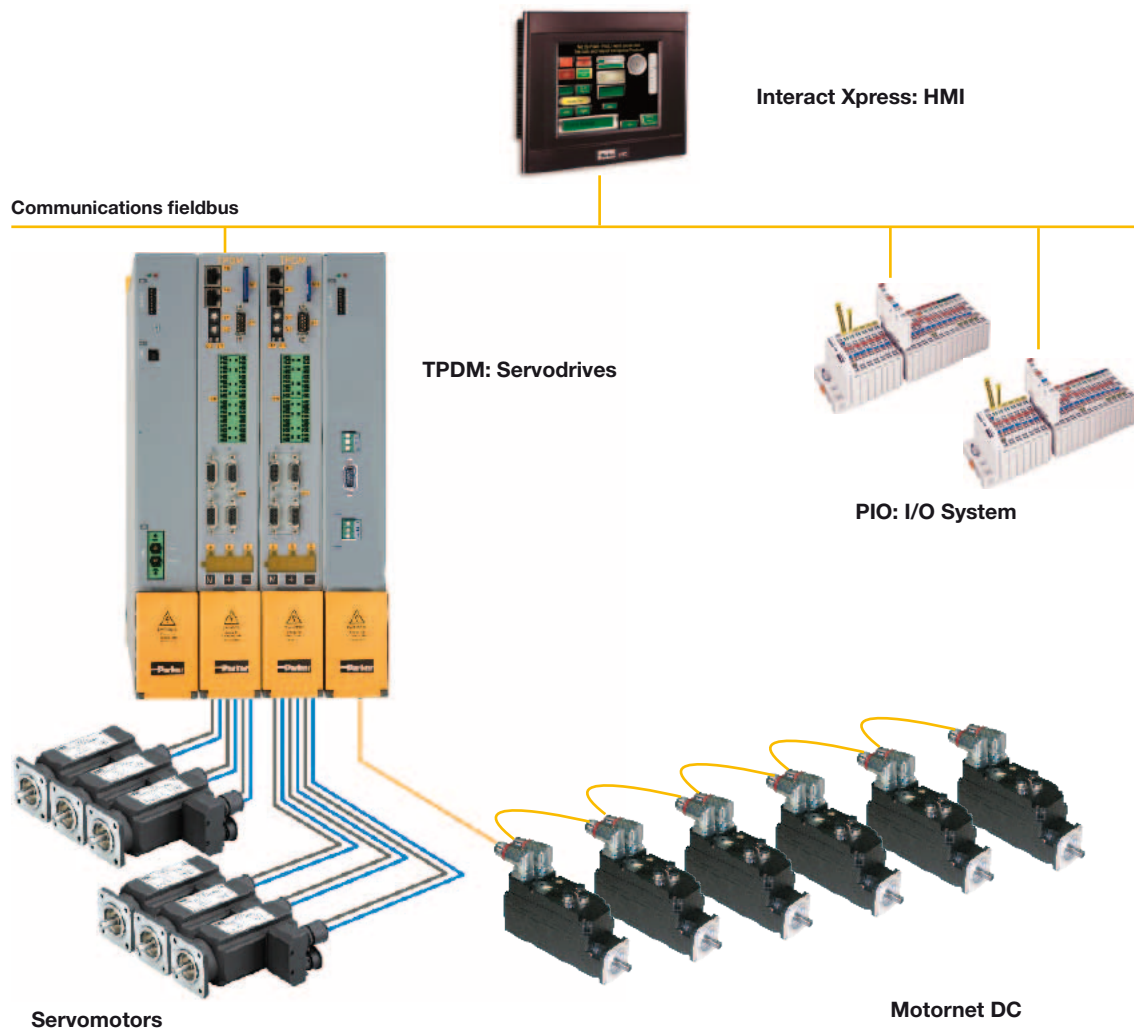


MotionWiz: MDC page - Main electronic control parameters and fieldbus status



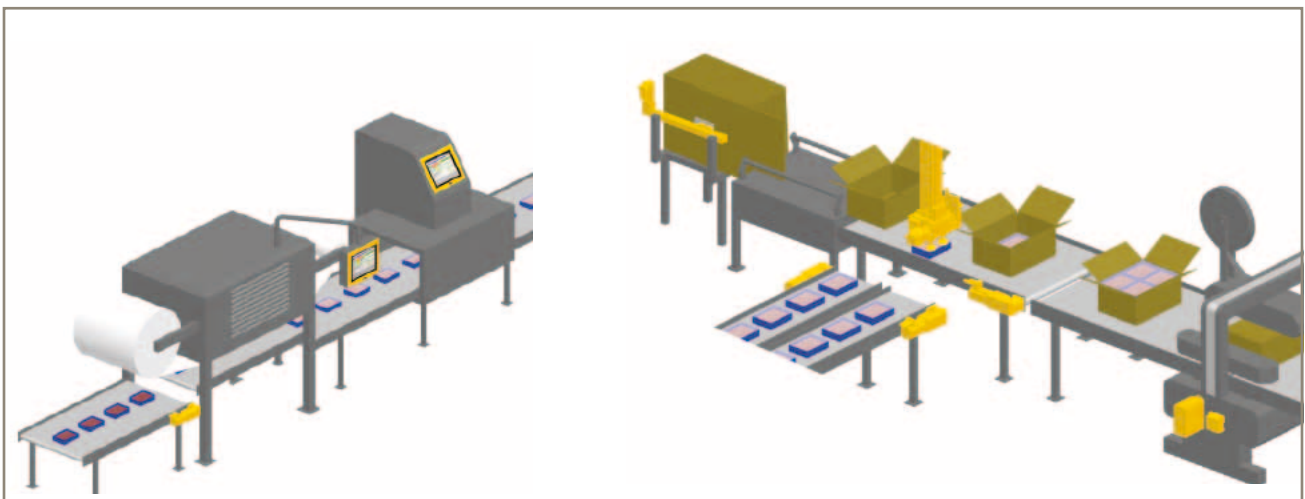
MotionWiz Oscilloscope: Real speed & torque trends

Hybrid Integrated Motion Solutions



Drives
Motornet DC

In this example Motornet DC is shown in a system which also uses the TPD-M series servoamplifier, SMB/H series servomotors, InteractXpress series HMI and PIO series 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.



Order Code

MDC - Motornet DC

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
Order example	MDC	E	A	60	30	5	9	S	Hxx	F4	M	R	E	64	4

1 Motor family	MDC Motornet DC - integrated resolver
2 Encoder*	Empty field Resolver
	E Encoder (option)
3 Brake*	Empty field Without holding brake
	A With holding brake (option)
4 Motor frame size (Refer to compatibility table)	
	60 60 mm motor frame
	70 70 mm motor frame
	100 100 mm motor frame
5 Nominal speed (Refer to compatibility table)	
	30 3000 min ⁻¹ (230/400 VAC - all frames)
	52 5200 min ⁻¹ (400 VAC - frame 100 only)
	60 6000 min ⁻¹ (230/400 VAC - not frame 100)
6 Flange	
	5 Flange 5 (available for all sizes)
	8 Flange 8 (contact your local sales office)
7 Shaft diameter	
	9 9 mm shaft (frame 60 only)
	11 11 mm shaft (frame 60 and 70)
	14 14 mm shaft (frame 70 only)
	19 19 mm shaft (frames 70 and 100)
	24 24 mm shaft (frame 100 only)
8 Smooth shaft - keyway	Empty field With keyway
	S Without keyway

9 Motor shaft*	Empty field Standard shaft
	Hxx Hollow shaft, xx = internal dia. (max 12 mm) Available only for MDC70 and MDC100 with resolver
10 Feedback	Empty field Standard resolver
	F4 Encoder EQI1130 (EnDat) (with E selected in block 2)
11 Increased inertia*	Empty field Standard inertia
	M Increased inertia (option)
12 Safe torque off (STO)*	Empty field Without safe torque off
	R With safe torque off (option)
13 Fieldbus	E EtherCAT
	D* CANopen (option)
14 Protection level	64 IP64 protection
	65 IP65 protection (option)
	67 IP67 protection (option)
15 AC supply voltage (PSU supply voltage)	2 230 VAC
	4 400 VAC

* Option currently under development

Motornet DC Hybrid Cables

	1	2	3	4
Order example	HYBCA	0030	PSI	4

1 Cable type	HYBCA	Hybrid cable for 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 MDC with PSI connector and female mating MDC connector
	MDC	Wired cable for MDC to MDC with male and female mating MDC connectors
4 Cable Size	Empty field	2.5 mm ² cable size
	4	4.0 mm ² cable size

Cables options

HYBCA1	MDC hybrid cable only (no connectors) - 1 m length / 2.5 mm ²
HYBCA14	MDC hybrid cable only (no connectors) - 1 m length / 4 mm ²
CONMDCMV	MDC hybrid connector (male)
CONMDCFV	MDC hybrid connector (female)
TAPMDCETH	Terminal cup for MDC EtherCAT
TAPMDCETHS	Terminal cup for MDC EtherCAT with Service Bus

Mains module: PSUP

	1	2	3	4	5	
Order example	PSU	P	10	D6	USB	M00

1 Device family	PSU	Power module
2 Device typ	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
We offer the following line chokes:
LCG-0055-0.45 mH (WxDxH: 180 mmx140 mmx157 mm; 10 kg)
LCG-0055-0.45 mH-UL (with UL certification)
(WxDxH: 180 mmx170 mmx157 mm; 15 kg)

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

PSI - Power Supply Interface for Motornet DC

	1	2	3
Order example	PSI	10	P

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

Flexible Servo Drive - Hi-Drive

Overview

Description

Hi-Drive is a fully digital drive for brushless motors with currents from 2 to 450 A and operating from 230 VAC or 480 VAC supplies. Hi-Drive is able to control induction motors; its target market is where high precision, accuracy, performance, fieldbus connectivity and custom applications are required.

Hi-Drive features several built-in motion control functions, including current, torque and speed control, positioning with trapezoidal profiles, digital lock with variable ratio and phase correction, electronic cam, real-time mode, S-ramp positioning, homing functions and position capture.

An axis card with Power PC 400 MHz micro processor which is able to control up to 32 interpolated axes via CANopen DS402, further enhances the Hi-Drive functionality.

The Hi-Drive series is suited for simple as well as extremely sophisticated applications such as: Printing machines, wood and metal working machines, feeders, palletizers, applications with different interpolated axes and robots.

Features

- Current, torque and speed control
- Positioner with trapezoidal profile and S-ramps
- Digital lock with variable ratio and phase correction
- Electronic cam
- Configurable feedback input
- Configurable second encoder input
- Fieldbus RS232, RS422/485, SBCCan, EtherCAT, CANopen DS402
- DC bus connection to clamping board is possible (mono or three-phased)
- Built-in braking resistor (to 45 A)
- Safety relay optional CAT.3 EN 954-1
- Built-in EMC filter: HID2...HID10, HID75...HID450
- Built-in three-phased line choke (HID75...HID155)



Drives
Hi-Drive

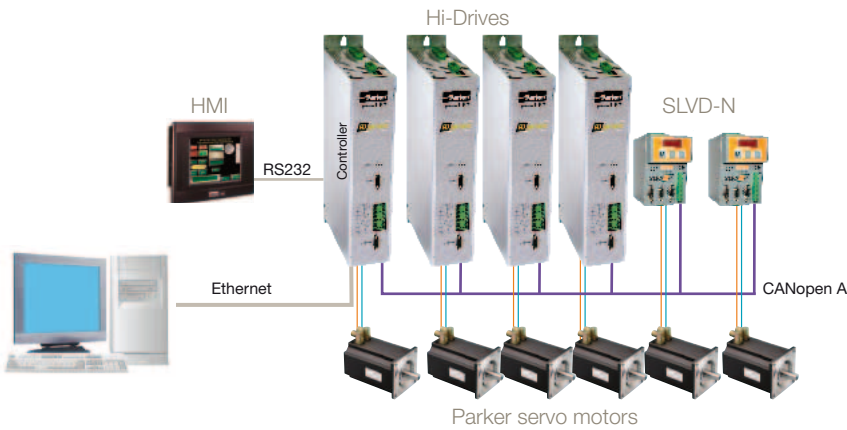
Technical Characteristics - Overview

Device	Nominal current [A]	Peak current [A]	Peak current time [s]	Frame size
HID2	2	4	2	1
HID5	5	10		
HID8	8	16		
HID10	10	20		2
HID15	15	30		
HID16	16	32		
HID25	25	50		
HID35	35	70	3	3
HID45	45	90		
HID75	75	135		
HID100	100	180		
HID130	130	234		
HID155	155	232		
HID250	250	375	6	
HID450	450	675		-

Applications

Trajectory control of a six axis vertical robot

This is a six axis vertical robot that drives the globe in order to direct a laser pointer on the desired city, selected from the onboard operator panel or from a remote interface. The application is driven by six servo drives, controlled by a CN board integrated in one of the drives. In the board resides the interpolation and transformation part of the robot coordinates. The data for the optimized trajectory are transmitted to the individual axes via CANopen with DSP402 profile, at defined times by the sync protocol. In order to reach motion uniformity, the controller card transmits the demand speed together with the optimized motion data. Thus, every servo drive can internally execute a cubical interpolation of the information received. Moreover at every synch the real CN quota are sent back to the six joints.



The human-machine interface is represented by an industrial PC. By the PC, the operator choose in a graphical globe the city it wants to reach and gives the start/stop command.

Technical Characteristics

Technical Data

Hi-Drive

Model		HID2	HID5	HID8	HID10	HID15	HID16	HID25
	Unit							
Supply voltage and device currents								
Supply voltage	[V]	200...277 VAC single phase(±10 %) 50-60 Hz (±5 %) 200...480 VAC three phase (±10 %) 50-60 Hz (±5 %)						
Nominal current	[A]	2	5	8	10	15	16	25
Peak current	[A]	4	10	16	20	30	32	50
Peak current time	[s]	2						
Control Voltage	[V]	24 VDC (0/ +10 %)						
Overload		200 % for 2 s						

Model		HID35	HID45	HID75	HID100	HID130	HID155	HID250	HID450	
	Unit									
Supply voltage and device currents										
Supply voltage	[V]	200...480 VAC three phase (±10 %) 50-60 Hz (±5 %)			380...480 VAC three phase (±10 %) 50-60 Hz (±5 %)					
Nominal current	[A]	35	45	75	100	130	155	250	450	
Peak current	[A]	70	90	135	180	234	232	375	675	
Peak current time	[s]	2			3					4.5
Control Voltage	[V]	24 VDC (0/ +10 %)								
Overload		200 % for 2 s								

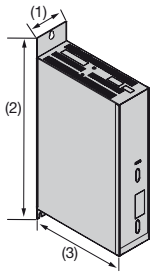
Ambient Conditions

Temperature range	Operating temperature 0...45 °C
Tolerated humidity	<85 % non condensing
Elevation of operating site	1000 m ASL (derate by 1.5 % every 100 m)
Product Enclosure Rating	IP20

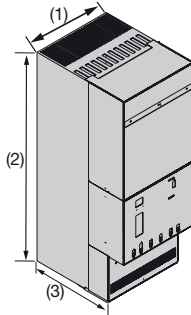
Standards and Conformance

In compliance with Directive 89/336/EEC following the standard:	<ul style="list-style-type: none"> EN61800-3 (I° and II° environment) with built-in filter when available/A11 Electromagnetic Compatibility
In compliance with Directive 73/23/EEC following the standard:	<ul style="list-style-type: none"> EN 50178 (Safety, Low Voltage Directive) EN 60204-1 EN 61800-2 EN 61800-5-1
Safety technology	EN 954-1/ISO 13849-1 (optional safety relay)
Conformance CE and UL	<ul style="list-style-type: none"> UL508C (USA) CSA 22.2 No. 14-05 (Canadian) CE marked
ATEX	for use in or in connection with potentially explosive environments

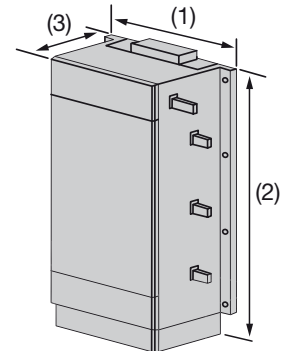
Dimensions



Sizes 1-2-3:



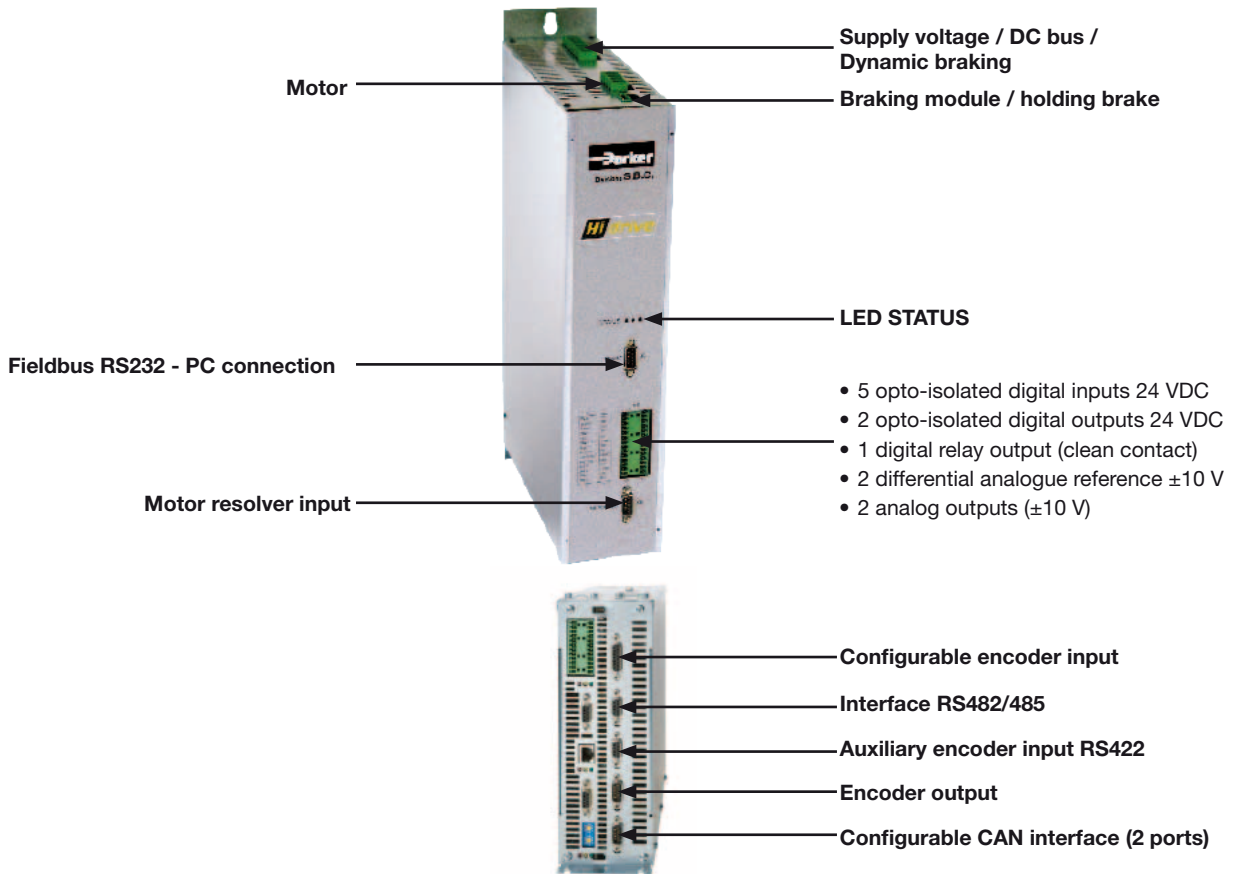
Sizes 4-5:



Size 6:

Model	Frame size	Height (2) [mm]	Width (1) [mm]	Depth (3) [mm]	Weight [kg]
HID 2-5-8-10-15	1	428	87	227	5.8
HID 15			-		
HID 16-25	2	428	122		8.5
HID 35-45	3		227	16	
HID 75	4	660	250	320	40
HID 100-130-155	5	720		365	59
HID 250	6	1145	600	465	100
HID 450	-	1400	900	465	-

Connection Layout



Accessories and Options

Keypad

SK161

Optional keypad, size 2x6 characters with upload/download functions (port RS232)



Cables

- Resolver cable
- Incremental encoder cable
- Absolute encoder EnDat + SinCos cable
- Absolute encoder Hiperface + SinCos cable
- Encoder SinCos cable
- Motor cable
- Servoventilation cable



Fieldbus Options

By selecting one of the numerous fieldbus options the Hi-Drive becomes a highly versatile networked drive. EtherCAT based on the Ethernet industry standard, has been implemented within the Hi-Drive to exploit operating performance of industrial PC's.

- EtherCAT
- CANopen (DS402)
- Profibus DP
- SBCCan (standard)



EtherCAT®

CANopen

PROFI®
BUS

Axis Board

High performances CN

This board is an axis controller which can be integrated into the Hi-Drive in order to increase the servo drive performance.

The board can generate trajectories of "n" interpolated axes with a low dissipated power, piloting the slave axis via CANopen DSP402.

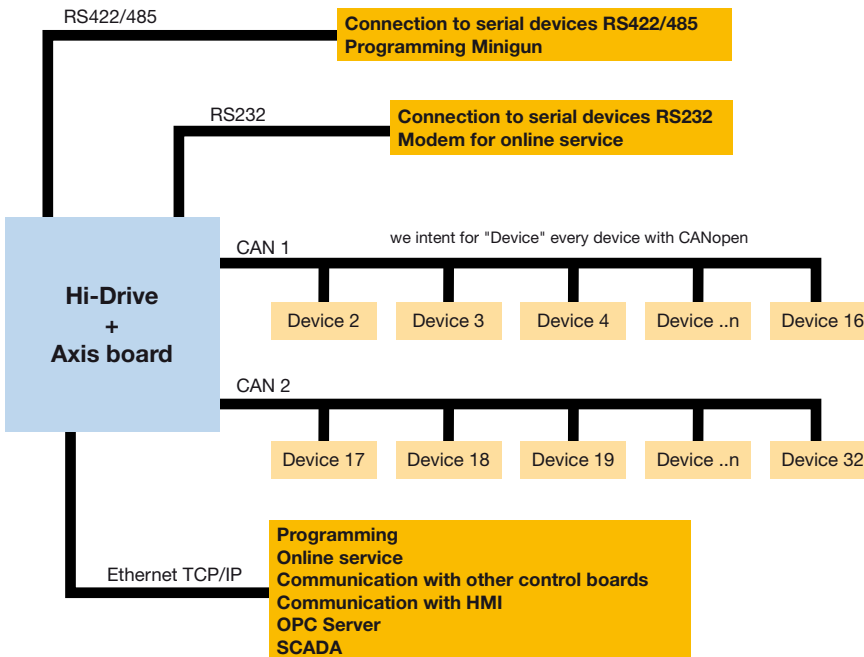
Managing resident I/O and field bus remote I/O the CN board can be linked to the plant network or to any operator panels via Ethernet TCP/IP. The board is equipped with an embedded OPC server.

Equipped with a multitasking real time operating system and can be programmed using standard programming and motion control languages.

- Power PC 400 MHz microprocessor
- Real time multitasking RTE operating system
- Cycle tasks, event control and background
- Interpolation of up to 32 axes for CPU
- CANopen DS402 communication channels
- Libraries with a wide range of function blocks
- 64 MB RAM, 128 MB extractable flash memory and 128 kB EEPROM
- RS232, RS485 and Ethernet



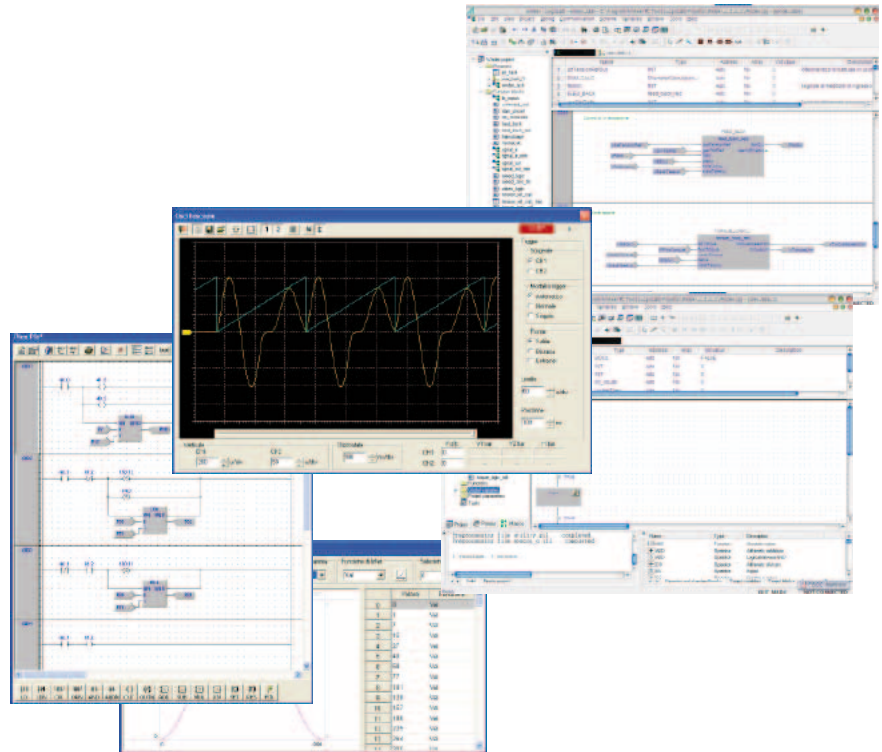
Programming language	
Structured text	for motion control functions
Ladder diagram	for machine cycles programming
ISO	for tool machines programming
RHLL	for robot programming



Software

MotionWiz and LogicLab

The free MotionWiz configuration software is available to configure the Hi-Drive system with just a few clicks of the mouse. MotionWiz features a simple and user-friendly interface to speed up installation, optimization 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 "online" mode, directly in the device, and in "offline" mode on a remote PC. In this case, personalized configuration can be sent to the mechanism subsequently. To simplify the configuration of systems with a large number of axis 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 environment programmable with standard languages. PicoPLC allows the external word to communicate with the drive and to execute function sequences. If the customer application requires additional calculation resources, an option board programmable with PLC commands in accordance with IEC61131-3 can be inserted.



Order Code

Hi-Drive

	1	2	3	4	5	Y1	Y2	Y3	9	10
Order example	HID	X	2	S	S	I	E5	C2	R	M

1 Device family

HID Servo drive

2 Version

Empty field Standard version

X ATEX device version

3 Device current (nominal current rms)

2 2 A

5 5 A

8 8 A

10 10 A

15 15 A

16 16 A

25 25 A

35 35 A

45 45 A

75 75 A

100 100 A

130 130 A

155 155 A

250 250 A

450 450 A

4 Protocol

S SBCCan (standard)

D CANopen (DS402)

5 Second input encoder

S for SinCos - 1 V_{pp} signal

E for digital signals after quadrature - RS422

H for SinCos signal + Hall sensor

Y1...Y3 Option cards (slot1, slot2, slot3)

Empty field without option

P PROFIBUS DP

I I/O option (8 digital inputs, 8 digital outputs)

E5 EtherCAT

C Axis board, without compact flash

C1 Axis card for up to 1.5 axes (with CANopen DS402)

C2 Axis card for up to 4 axes (with CANopen DS402)

C3 Axis card for up to 32 axes (with CANopen DS402)

9 Safety technology

Empty field without option

R Built-in Safety relay cat. 3 in accordance with EN 954-1

10 Memory

Empty field without option

M Memory area for retentive variables

Servo Drive - 638 Series

Overview

Description

638 series servo drives are suitable for all servo applications, from simple speed or current control to most complex positioning applications. The processor of 638 series servo drives gives a rapid response time to the control circuits of 105 μ s. Numerous expansion slots allow 638 series servo drives to reach a high degree of versatility, opening access to a wide variety of fieldbus communication and feedback sensors options.

Features

- Integrated motion controller
- 230 or 400 VAC direct power supply
- STO: Safety torque off in accordance with EN13489-1 Category 3, Performance Level d and EN1037 as standard
- Ultra-fast control loops (105 μ s)
- Embedded PLC functions
- Programmable electronic cam
- 3 configurable trajectory generators
- Multi-axis synchronization through process bus
- Numerous fieldbuses options
- Hiperface and SSI encoder inputs options
- Optional flash memory chip for data storage
- Simple commissioning and programming Software



Technical Characteristics - Overview

638 Servo drives	
Supply voltage	1*230 VAC (\pm 10 %), 50 - 60 Hz 3*230 VAC (\pm 10 %), 50 - 60 Hz 3*400/480 VAC (\pm 10 %), 50 - 60 Hz
Permanent current [Arms]	1...15
Peak current [A]	2...30
Overload	200 % during 5 s
Operating temperature	0...40 °C
Humidity	< 85 % relative humidity non-condensing
Altitude	1000 m (1 % derating per 100 m up to 4000 m)
Product enclosure rating	IP20



Technical Characteristics

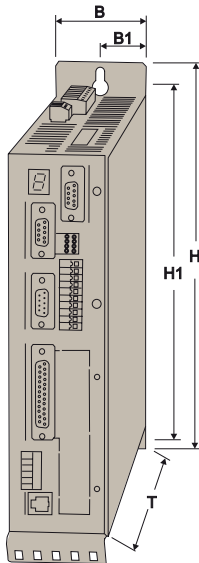
Technical Data

Model 638....F0STO	Unit	A013	A023	A043	A063	B036 ⁽¹⁾	B056 ⁽¹⁾	B086 ⁽¹⁾	B106 ⁽¹⁾	B156 ⁽¹⁾
Supply and currents										
Supply voltage	[V]	1*230 VAC (±10 %), 50 - 60 Hz 3*230 VAC (±10 %), 50 - 60 Hz				3*400 VAC (±10 %), 50 - 60 Hz				
Permanent current	[Aeff]	1	2	4	6	2.5	5	7.5	10	15
Peak current (200 % for 5 s)	[A]	2	4	8	12	5	10	15	20	30
Frame size		A				B				
Control voltage	[V]	24 VDC								
Operating temperature		0...40 °C (2 % derating per °C between up to 50 °C)								
Humidity		< 85 % relative humidity non-condensing								
Altitude		1000 m (1 % derating per 100 m up to 4000 m)								
Product enclosure rating		IP20								

¹⁾ Also available with 230 and 480 VAC power supply

Input / outputs (X10 Plug)	<ul style="list-style-type: none"> • 8 Digital inputs (24 V) including 2 interrupts • 5 Digital outputs (24 V) including 3 opto-coupled (configurable) and 2 relays (1 configurable, 1 for drive ready) • 2 Analog inputs (0 - 10 V, ±10 V) • 2 Analog outputs (±10 V)
Configurable feedback interface (X30 plug)	<ul style="list-style-type: none"> • Resolver input (standard) • Hiperface encoder input (option) • Sine / Cosine encoder input (option)
Optional Flash memory chip (X300 - module)	<ul style="list-style-type: none"> • Storage of complete drive data (firmware, function code, parameters, applications program)
Configurable multi-function interface (X40 plug)	<ul style="list-style-type: none"> • Incremental encoder input • Incremental encoder output • Stepper-motor input • Absolute single or multi-turn SSI encoder input
Communication	<ul style="list-style-type: none"> • Serial communication (COM1 Interface) RS232 • Application communication (COM2 Interface) <ul style="list-style-type: none"> • RS232, RS422, RS485 • Profibus-DP • CANopen DS402 • Inter axis communication (COM3 Interface) Parker System bus / RS485
I/O extension	<ul style="list-style-type: none"> • 5 Digital Inputs / 2 Digital Outputs (COM2 Interface) • 14 Digital Inputs / 10 Digital Outputs (X200 Plug) • 4 Digital Inputs / 4 Digital Outputs (X120 Plug)
Safety	<ul style="list-style-type: none"> • STO: Safety torque off in accordance with EN13489-1 Category 3, Performance Level d and EN1037 as standard (connector STO X11) • Brake / PTC output (BR/TH X62 Plug)
Standards & Conformance	<ul style="list-style-type: none"> • CE marked: <ul style="list-style-type: none"> • EN61800-3 (EMC compliance) with integral filter • EN50178 (Safety, low voltage) • UL certification

Dimensions



Model	Nominal current [A]	B [mm]	H [mm]	T [mm]	B1 [mm]	H1 [mm]	Weight [kg]
638A	1 ... 6	56	250	232	28	211	1.6
638B	2.5 ... 5	66	318.6		44	281.25	4.4
	7.5 ... 15	86					

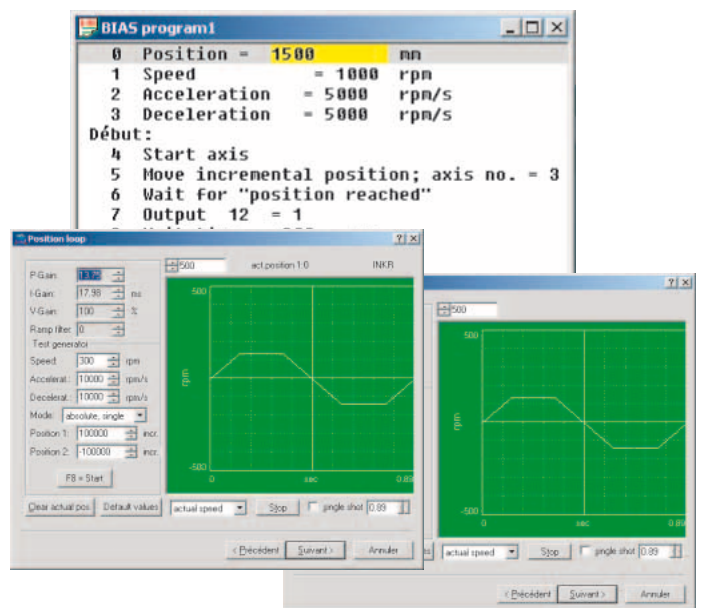
Accessories

EASYSRIDER Software

EASYSRIDER is a graphical software for the 630 series providing a single user interface for accessing all drive parameters, programming motion and calibrating the drive. This unique assistant offers an autopilot mode helping user in all phases of application set-up: from the choice of the motor in the motor library to the drive auto adjustment. All set-up steps are extremely simplified. EASYSRIDER gives also the possibility to develop advanced motion in an intuitive way using its BIAS language.

Features

- Intuitive and easy use
- Set-up assistant
- Integrated motor library
- Oscilloscope function
- Drive and fieldbus diagnostic
- Drive advanced programming



Order Code

	1	2	3	4	5	6	7	8	9	10	11	12
Order example	638	x	xx	3	F	0	STO	000	EAE	RD2	RM1	X7x

1 Series	
638	638 series

2 Frame size	
A	Size A
B	Frame B

3 Nominal current		
01	1 A	
02	2 A	
04	4 A	Size A
06	6 A	
03	2.5 A	
05	5 A	
08	7.5 A	Frame B
10	10 A	
15	15 A	

4 Intermediate circuit voltage	
3	325 VDC / 230 VAC
6	565 VDC / 400 VAC
7	678 VDC / 480 VAC

5 Filter	
F	With integrated filter (Standard)
A	Less leakage current (AC side Y capacitors deactivated, JP600 open)

6 EMC clip	
0	Without EMC - clip (Standard)

7 Safety technology	
STO	Safe Torque Off (Standard)

8 Additional option module RP xxx via COM2		Slot
000	No option	A (A, B)
232	RS232 interface	A (B)
422	RS422 interface	A (B)
485	RS485 interface	A (B)
CAN	CAN-Bus interface	B (A)
CCA	CANopen (DS402) + Parker System bus + RS485	B (A)
CC8	CANopen (DS402) + Parker system bus + 4 inputs and 4 outputs + RS485	B (A)
PDN	PROFIBUS DP	B (A)
PC8	Profibus DP+CAN2+outputs and 4 inputs + RS485	B (A)
PCA	Profibus DP+CAN2 + RS485	B (A)
EA5	I/O Interface (5 inputs, 2 outputs)	

9 Additional option module on the drive via X200		Slot
---	--	------

000	No option	-
EAE	I/O Interface (14 inputs, 10 outputs)	C
CCA ⁽¹⁾	Parker System bus + RS485	C
CC8 ⁽¹⁾	Parker system bus + 4 inputs and 4 outputs + RS485	C

10 X300 Functions module		
RD2	Standard X30 Resolver module	D
HF2	HIPERFACE Module	D
SC2	Sine/Cosine Module	D

11 With memory chip		
RM1	Resolver + Memory-Module	D
HM1	HIPERFACE + Memory Module	D
SM1	Sine/Cosine + Memory Module	D
EM1	EnDat + Memory module	D

12 Additional option	
empty	no additional options
X7x	Ready - contacts X10.7 - X10.8
BSx	Moisture / condensation protection

⁽¹⁾ Cannot be combined with CCA, CC8, PC8, PCA
No CANopen DS402

Micro Servo Drive - ViX

Overview

Description

The freely-programmable, intelligent ViX servo drive delivers high levels of functionality and flexibility in programmable motion control. With an output in the 250-500 VA power range, ViX uses field-oriented digital control technology, to give enhanced dynamic performance with improved efficiency. Housed within an extremely compact case, ViX is suitable either for direct panel mounting or for attachment to a standard DIN rail.

The ViX drive is produced in two versions having continuous current ratings of 2.5 A and 5 A at motor bus voltages up to 80 V. A peak current capability of three times the continuous rating provides an outstanding acceleration performance. The device offers the choice of either resolver or encoder feedback (user selectable). To assist with initial commissioning, the drive can correct most motor and feedback wiring errors automatically.



Features

- Fully digital design
- Field-oriented control for improved dynamic performance
- Panel or DIN rail mounting
- 2.5 A & 5.0 Arms
- 80 V DC Bus
- Built-in controller using Parker's proven EASI code
- Powerful EASI-V front-end software
- Programmable resolution
- Optional CANopen/RS485 interface
- Automatic standby current reduction
- Compact size
- Compatible with Parker servo motors

Technical Characteristics - Overview

Device	Continuous current [Arms]	Peak current [A] (<2 s)	Interface	Supply voltage [VDC]
ViX250-AE	2.5	7.5	analog	24 & 24...80
ViX500-AE	5	15		24 & 48...80
ViX250-AH	2.5	7.5	High Res analog	24 & 24...80
ViX500-AH	5	15		24 & 48...80
ViX250-IE	2.5	7.5	Easi Code	24 & 24...80
ViX500-IE	5	15		24 & 48...80
ViX250-IH	2.5	7.5	High Res Easi Code	24 & 24...80
ViX500-IH	5	15		24 & 48...80
ViX250-CE	2.5	7.5	CANopen	24 & 24...80
ViX500-CE	5	15		24 & 48...80
ViX250-CH	2.5	7.5	High Res CANopen	24 & 24...80
ViX500-CH	5	15		24 & 48...80

Product Description

A powerful front-end software package is supplied with the drive and permits straightforward, rapid configuration and tuning. When used with Parker servo motors, only the motor type number is required for full configuration.

ViX intelligent drives incorporate a powerful controller using Parker's well-proven EASI command language. As well as carrying out all basic motion control functions, the controller performs more advanced operations such as external encoder following and registration moves. All necessary configuration is performed by software. In addition to an RS232C interface which is included in the standard drive, an optional factory-installed fieldbus module allows for both CANopen and RS485 communication. The base version of the drive can be controlled by step-direction signals in addition to an analog velocity or torque demand. ViX forms part of a new, fully-integrated system of motion control components which includes digital servo and stepper drives, power supplies, operator panels and extension I/Os. These components complement Parker's range of mechanical positioning systems which includes precision tables, electric cylinders and linear actuators.

Digital technology

The operating core of the ViX drive is based on a powerful digital processor. Armed with information about the motor and drive parameters, the processor is able to set the operating conditions in the current loop with a high degree of precision. In this way the bandwidth of the torque amplifier can be optimized for the specific configuration, allowing a wide range of motors to be accommodated without compromising on performance. In addition, set-up is virtually instantaneous without the need to adjust multiple parameters. The relevant data for Parker high-performance servo motors is held in a database within the EASE-V software package.

Flexible communication options

ViX is supplied as standard with an integral RS232 communication interface. To keep the wiring as simple as possible, dual RJ45 connectors on the underside of the drive provide a built in daisy-chaining facility. The last drive in the chain automatically detects that no more units are connected and creates a loop return back to the host controller. Optional built-in modules provide both RS485 and CANopen communication to allow for integration within Fieldbus systems.

Powerful, user-friendly configuration software

ViX series drives utilize Parker's EASI-V software package, a comprehensive front-end tool for system configuration and tuning. This Windows™-based software incorporates wizard-guided set-up procedures using simple click-entry screens. Configuration is simple and straightforward. Entering the data for Parker servo motors could not be easier - simply select the motor from a pull down menu. Other motors may be used by entering the relevant parameters.



Technical Characteristics

Technical Data

ViX servo drive

Model		ViX250	ViX500
	Unit		
Supply voltage and current			
Supply voltage	[V]	24...80 VDC +5 % -15 %	48...80 VDC +5 % - 15 %
Input current	[A]	2.5 (typ. 2...2.5)	6.3 (typ. 4...5)
Capacitance power module	[µF]	3300	6600
Output current (rms)	[A]	2.5	5
Peak current ⁽¹⁾	[A]	7.5	15
Logic voltage	[V]	24 VDC (21...27 VDC), 250 mA (without encoder, brake, outputs)	
Motor inductance	[mH]	0.5...10 mH recommended (speed range reduced if >10 mH)	
Motor current	[A]	selectable by software	
Motor brake		24 V, max. 2 A, energized to release	

⁽¹⁾ Maximum duration at peak current 2 seconds, maximum duty cycle 10 %. The time limit is set by an I²t circuit, and will be reduced if the motor is stationary.

Inputs, Outputs, Interfaces, Feedback systems

Protection	<ul style="list-style-type: none"> • Short circuit (phase to phase, phase to ground) • Motor HV over & under-voltage trip • Drive/motor overtemperature (I²t) • Reverse polarity on 24 V input • Commutation encoder fault, resolver fault
Feedback	<ul style="list-style-type: none"> • Resolver • Quadrature encoder (selected by software)
Resolver	12 Bit A/D (4096 counts/rev), absolute accuracy 30 arcmin
Encoder	5 V differential, 400 kHz max input frequency, resolution 500-5000 lines (pre-quadrature, i.e. up to 20000 counts/rev) Encoder supply: 5 V output for feedback & following encoder, 250 mA max. loading
Inputs / outputs	<ul style="list-style-type: none"> • Analog input ⁽²⁾: ±10 V differential, 12 bit resolution, velocity or torque demand • Position command input ⁽²⁾: Step/direction, step+/step- or quadrature encoder input with resolution equivalent to feedback device • Following encoder input: Compatible with feedback resolution, max. input freq. 2.0 MHz, configurable also as step/direction or step+/step- input • Digital inputs: 5 (4 are configurable as Home, Limits & Registration). Operating range 5...24 V. Software-configurable 4K7 pull-up/active low or 4K7 pull-down/active high • Digital outputs: 3 (one is configurable as Drive Healthy). Software-configurable active-low/sinking (5...24 V) or active-high/sourcing (24 V only), 50 mA max. per output • Encoder output: 5 V differential, resolution of feedback encoder or 4096 counts/rev for resolver • Fault output: NPN, open-collector output, normally low, active high • Analog output: 10-Bit, filtered PWM monitor output, torque or velocity

Communication interface

- RS232 (standard)
- RS485
- CANopen

High-speed interface

Dual RJ45 connectors for CANopen, RS485 etc. (also provide daisy-chain ports for multi-axis RS232 connections)

Indicators

LEDs for HV/feedback fault, drive fault & comms status

⁽²⁾ Analog input versions only.

Environmental Characteristics

Temperature range

0-50 °C local environment (fan cooling required above 40 °C)

Humidity

95 % non-condensing

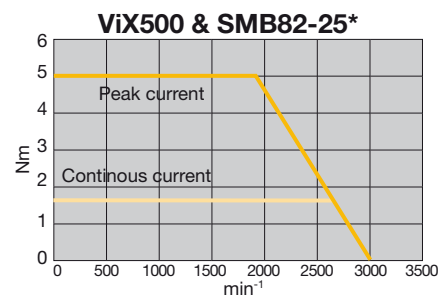
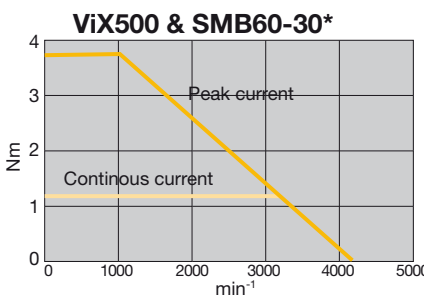
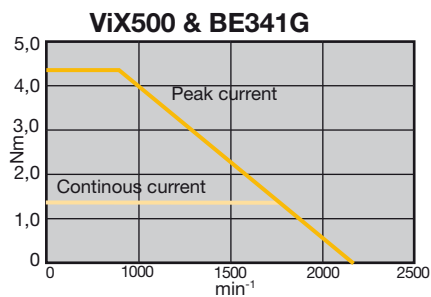
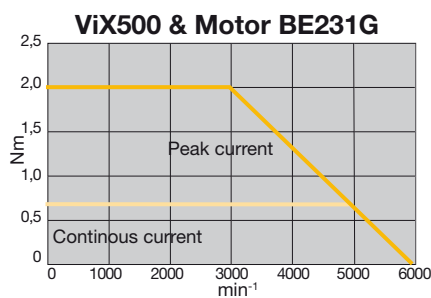
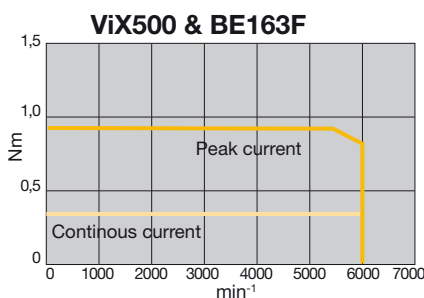
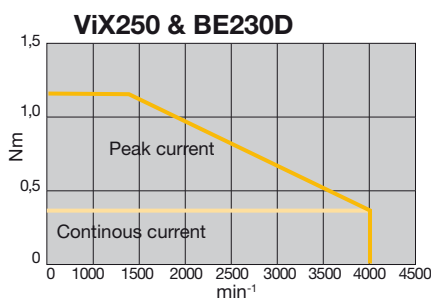
Standards and Conformance

CE - conformance and UL - listing

- CE marked
- UL recognized - E194158

Performance Data

ViX servo drive with motor

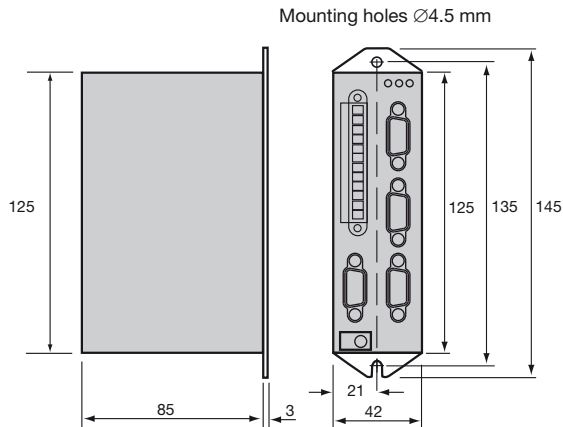


* 80 V windings

Dimensions

ViX servo drive

Dimensions [mm]



Mounting

vertical mounting, min. clearance 50 mm above & below drive, 10 mm each side panel
mounting standard, DIN rail adaptor available

Accessories and Options

Parker offers a range of accessories for ViX drives including mating connector sets, motor cables and a DIN rail mounting kit. The range will be extended to include operator panels and I/O expansion modules.

Power module: VXLPSU240 and VXLPSU960

The Parker power supply offers a convenient way of powering a ViX servo drive. The continuous rated output is 240 W at 230 VAC input and supplies the 80 V main DC rail and operates directly from all AC supplies between 90 V and 264 V. No external EMC filters are required unless the motor leads are exceptionally long (e.g. greater than 30 m).

Technical characteristics

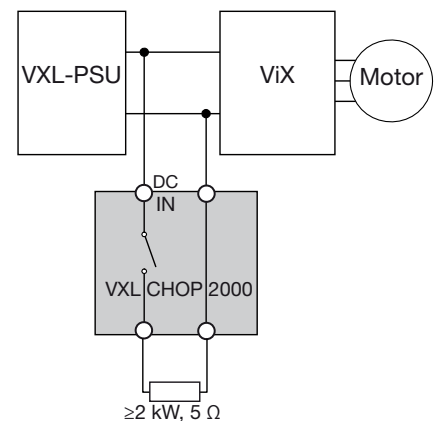
Power module:	VXLPSU240	VXLPSU960
AC input voltage, nominal (absolute limits)	115...230 VAC, 1phase (90...264 VAC)	400...500 VAC, 3phase
DC voltage	80 VDC, 3 A	80 VDC, 12 A
Rated output	240 W	960 W
Power factor	>0.895	>0.92
Dimensions (HxWxD)	140x63.5x118 mm	127x80x139 mm
Weight	0.720 kg	1.2 kg

Motor brake controller: VXLCHOP2000

The function of the VXLCHOP2000 is to dissipate the energy delivered by the motor in an external resistor thus damping the resulting overvoltage on the DC Bus. Up to 4 VXLCHOP2000 units can be connected in parallel to increase the braking power.

Technical characteristics

Motor brake controller:	VXLCHOP2000
DC voltage	80 VDC (24...110 VDC)
Rated output	2 kW
External braking resistor	≥2 kW, 5 Ω (provided by the customer)
Dimensions (HxWxD)	115x39x128 mm
Weight	0.2 kg



Order Code

ViX Servo Drive

	1	2	3	4
Ordering example	ViX	250	I	E

1	Device type	
	ViX	ViX servo drive
2	Power	
	250	250 VA
	500	500 VA
3	Controlling	
	I	Internal controller
	C	CAN & RS485-interface
	A	Analog input
4	Feedback option	
	E	Encoder or resolver
	H	High-resolution sine-cosine feedback ⁽¹⁾

⁽¹⁾ for use with the Parker linear motor tables. For further details, please refer to the corresponding catalog.

Accessories

Power module

	1	2
Ordering example	VXLPSU	240

1	Device type	
	VXLPSU	Power module
2	Rated power	
	240	240 W
	960	960 W

Motor brake controller

	1	2
Ordering example	VXLCHOP	2000

1	Device type	
	VXLCHOP	Motor brake controller
2	Rated power	
	2000	2 kW

Micro Stepper Drive - ViX

Overview

Description

The award-winning ViX intelligent digital servo drive from Parker Hannifin has now been joined by a high-performance microstep version. Like its servo equivalent, the ViX microstep drive uses field-oriented digital control technology to give enhanced dynamic performance with improved efficiency. Housed within an extremely compact case, ViX is suitable either for direct panel mounting or for attachment to a standard DIN rail using an optional adaptor. The ViX microstep drive is produced in two versions having current ratings of 2.8 A and 5.6 A RMS at motor bus voltages up to 80 VDC. User resolution is freely programmable between 400 and 51 200 steps/rev. Regardless of the programmed resolution, the motor always operates at maximum resolution for optimum smoothness over the entire speed range. The power stage features full PWM control for accurate microstepping performance.



Features

- Fully digital design
- Field-oriented control for improved low-speed performance
- Panel or DIN rail mounting
- 2.8 A & 5.6 A (rms)
- Up to 80 V DC bus
- Built-in controller using Parker's proven EASI code
- Powerful front-end software
- Fully-programmable resolution, up to 51 200 increments/rev
- Optional CANopen / RS485 interface
- Automatic standby current reduction
- Compact package
- Compatible with Parker high performance stepper motors

Technical Characteristics - Overview

Device	Continuous current [A _{rms}]	Peak current [A] (<2 s)	Interface	Supply voltage [VDC]
ViX250-IM	2.8	4	Step+ Direction	24 & 24...80
ViX500-IM	5.6	8		24 & 48...80
ViX250-CM	2.8	4	CANopen	24 & 24...80
ViX500-CM	5.6	8		24 & 48...80

Product Description

ViX intelligent microstep drives incorporate a powerful motion controller using Parker's well-proven EASI command language. As well as carrying out all standard motion-related functions, the controller performs more advanced operations such as external encoder following and registration moves. All necessary configuration is performed by software. In addition to an RS232C interface which is included in the standard drive, an optional factory-installed fieldbus expansion module allows for both CANopen and RS485 communication.

A comprehensive front-end software package is available which permits rapid configuration of the drive. When used with Parker stepper motors, only the motor type number is required for configuration of all relevant motor parameters. Parker's power supplies offer a convenient way of powering ViX microstep drives.

ViX forms part of a new, fully-integrated system of motion control components. The ViX microstep drive forms part of a new, fully-integrated system of motion control components which includes digital servo and stepper drives, power supplies, operator panels and I/O expansion units. These components complement Parker's range of mechanical positioning systems which includes precision tables, electric cylinders and linear actuators.

Digital technology

The operating core of the ViX microstep drive is based on a powerful microprocessor. Armed with information about the motor and drive parameters, the processor is able to set the operating conditions in the current loop with a high degree of precision. In this way the bandwidth of the torque amplifier can be optimized for the specific configuration, allowing a wide range of motors to be accommodated without compromising on performance. In this way the bandwidth of the output amplifier can be optimized for the specific configuration, allowing a wide range of motors to be accommodated without compromising on performance. In addition, set-up is exceptionally straightforward with the relevant data for Parker high-performance stepper motors being held in a database within the EASI-V software package.

Flexible communication options

ViX is supplied as standard with an integral RS232 communication interface. To keep the wiring as simple as possible, dual RJ45 connectors on the underside of the drive provide a built in daisy-chaining facility. The last drive in the chain automatically detects that no more units are connected and creates a loop return back to the host controller. Optional built-in modules provide both RS485 and CANopen communication to allow for integration within fieldbus systems.

Freely-programmable user resolution

The ViX microstep drive is exceptionally easy to integrate into any mechanical arrangement since the user resolution may be set anywhere between 400 and 51 200 steps/rev. This means you can always set distances within your program using convenient units, even if there is an odd transmission ratio or leadscrew pitch. Moreover, the drive power stage always operates at maximum resolution.



Technical Characteristics

Technical Data

ViX stepper drive

Model ViX		ViX250	ViX500
	Unit		
Supply voltage and current			
Supply voltage	[V]	24...80 VDC +5 % -15 %	48...80 VDC +5 % - 15 %
Input current	[A]	2.8 (typ. 2...2.5)	5.6 (typ. 4...5)
Capacitance power module	[µF]	3300	6600
Nominal current (rms)	[A]	2.5	5.6
Peak current	[A]	4	8
Logic voltage	[V]	24 VDC (21...27 VDC), 250 mA (without encoder, brake, outputs), additional 50 mA for fieldbus extension module	
Motor inductance	[mH]	0.5...20 mH recommended	
Motor current	[A]	Software-programmable up to 50 % of the nominal current	
Standby current		50 % to 100 % of programmed current, software-selectable (including delay)	
Internal motor resolution		51 200 steps/rev (fixed)	
User resolution		is freely programmable between 400 and 51 200 steps/rev.	

Inputs, Outputs, Interfaces

Protection	<ul style="list-style-type: none"> • Short circuit (phase to phase, phase to ground) • Motor HV over & under-voltage trip • Drive/motor overtemperature • Reverse polarity on 24 V input • Encoder fault
Encoder (optional)	Standard quadrature encoder: 5 V differential, 200 kHz max. channel frequency, resolution between 500 and 5000 lines (i.e. up to 20 000 counts/rev). Encoder supply: 5 V output, 350 mA maximum loading
Inputs / outputs	<ul style="list-style-type: none"> • Analog input: ±10 V differential, 12 bit resolution, velocity or torque demand and feed rate override • Position commanding/following encoder input: Step/direction, step+/step- or quadrature encoder input mirrors the feedback encoder • Digital inputs: 5 (4 are configurable as Home, Limits & Registration. Operating range 5...24 V, Software-configurable 4K7 pull-up/active low or 4K7 pull-down/active high) • Digital outputs: 3, Software-configurable active-low/sinking (5 V-24 V) or active-high/sourcing (24 V only). 50 mA max. per output • Encoder output: Step/direction, step+/step- or quadrature, mirrors the feedback encoder • Fault output: NPN open-collector output, normally low, active high
Communication interface	<ul style="list-style-type: none"> • RS232 (standard) • RS485 • CANopen
High-speed interface	Dual RJ45 connectors for CANopen, RS485 etc. (also provide daisy-chain ports for multi-axis RS232 connections)
Indicators	LEDs for HV/feedback fault, drive fault & comms status

Environmental Characteristics

Temperature range

0...50 °C local environment (airflow>0.5 m/s required above 40 °C)

Humidity

95 % non-condensing

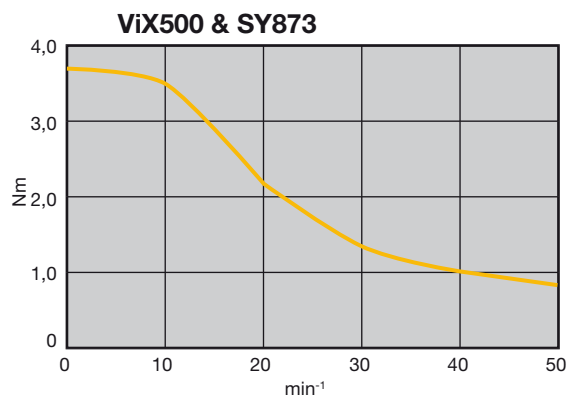
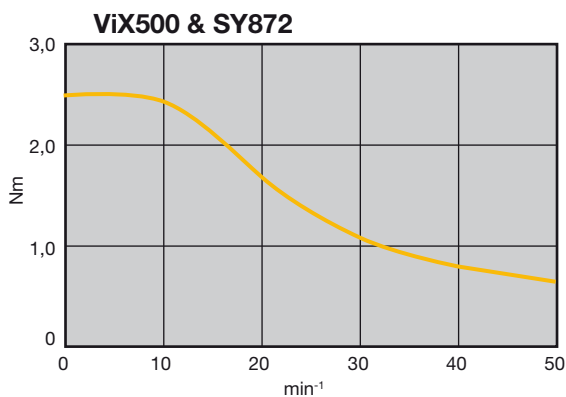
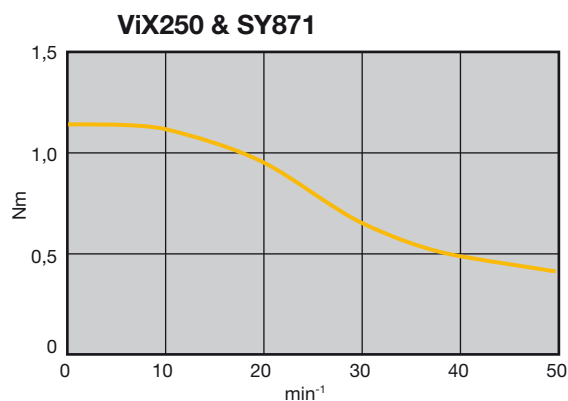
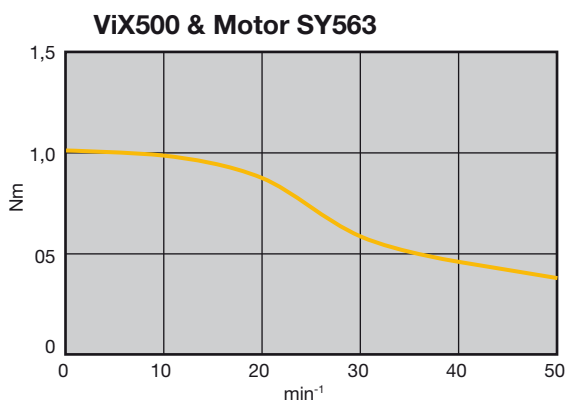
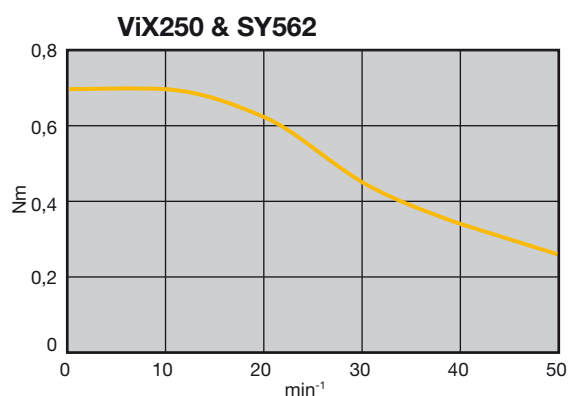
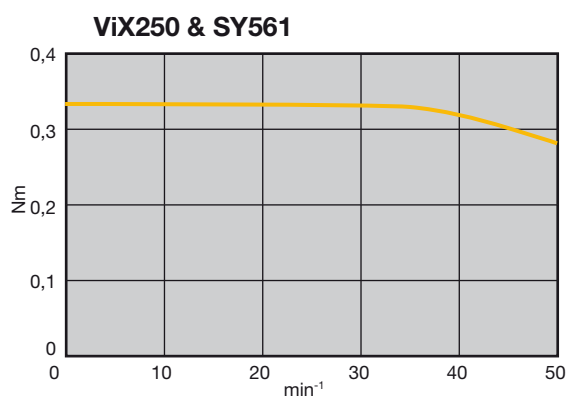
Standards and Conformance

CE - conformance and UL - listing

- CE marked
- UL recognized - E194158

Performance Data

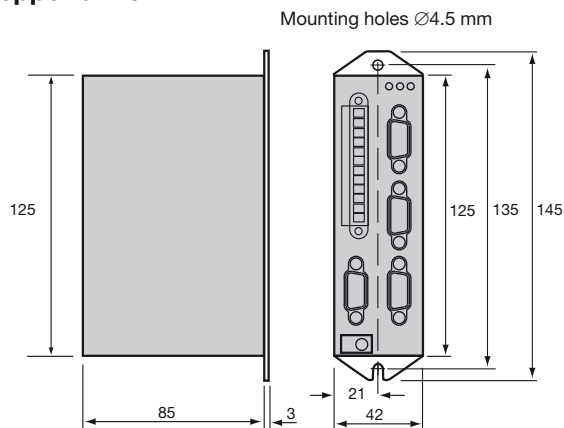
ViX stepper motor drive with SY stepper motor



Dimensions

ViX stepper drive

Dimensions [mm]



Mounting

vertical mounting, min. clearance 50 mm above & below drive, 10 mm each side panel
mounting standard, DIN rail adaptor available

Accessories and Options

Parker offers a range of accessories for ViX drives including mating connector sets, motor cables and a DIN rail mounting kit. The range will be extended to include operator panels and I/O expansion modules.

Power module: VXLPSU240 and VXLPSU960

The Parker power supply offers a convenient way of powering a ViX servo drive. The continuous rated output is 240 W at 230 VAC input and supplies the 80 V main DC rail and operates directly from all AC supplies between 90 V and 264 V. No external EMC filters are required unless the motor leads are exceptionally long (e.g. greater than 30 m).

Technical characteristics

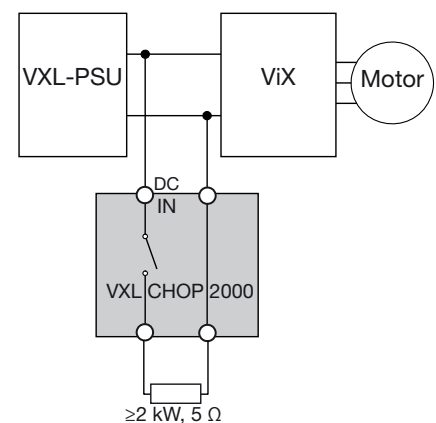
Power module:	VXLPSU240	VXLPSU960
AC input voltage, nominal (absolute limits)	115...230 VAC, 1phase (90...264 VAC)	400...500 VAC, 3phase
DC voltage	80 VDC, 3 A	80 VDC, 12 A
Rated output	240 W	960 W
Power factor	>0.895	>0.92
Dimensions (HxWxD)	140x63.5x118 mm	127x80x139 mm
Weight	0.720 kg	1.2 kg

Motor brake controller: VXLCHOP2000

The function of the VXLCHOP2000 is to dissipate the energy delivered by the motor in an external resistor thus damping the resulting overvoltage on the DC Bus. Up to 4 VXLCHOP2000 units can be connected in parallel to increase the braking power.

Technical characteristics

Motor brake controller:	VXLCHOP2000
DC voltage	80 VDC (24...110 VDC)
Rated output	2 kW
External braking resistor	≥2 kW, 5 Ω (provided by the customer)
Dimensions (HxWxD)	115x39x128 mm
Weight	0.2 kg



Order Code

ViX Stepper Drive

	1	2	3	4
Ordering example	ViX	250	I	M

1	Device type	
	ViX	ViX stepper drive
2	Power	
	250	250 VA
	500	500 VA
3	Controlling	
	I	Internal controller
	C	CAN & RS485-interface
4		
	M	Microstep motor drive

Accessories

Power module

	1	2
Ordering example	VXLPSU	240

1	Device type	
	VXLPSU	Power module
2	Rated power	
	240	240 W
	960	960 W

Motor brake controller

	1	2
Ordering example	VXLCHOP	2000

1	Device type	
	VXLCHOP	Motor brake controller
2	Rated power	
	2000	2 kW

DC Servo Drive - RTS

Overview

Description

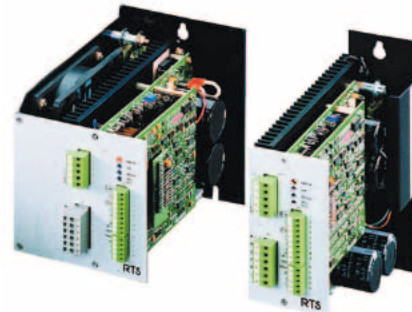
The RTS servo amplifiers are designed for driving DC servo motors and are available in ratings up to 6.5 kW.

These products enable speed control of DC motors with or without tachometers.

They integrate main supply, auxiliary supply and braking resistor circuits in a compact package.

Features

- Battery, single-phase or three-phase power supply
- U-RI or tachometer control
- Integrated braking resistor
- Full protecting features
- High compactness
- Panel or rack mounting
- 3U Eurocard



Technical Characteristics - Overview

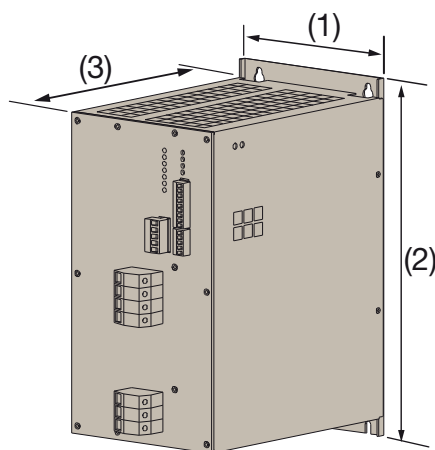
RTS Series	
Power supply	Single phase, three phase or battery
Nominal current	3...40 A
Peak current	10...80 A
Operating Temperature	0...40 °C (derate by 35 % per 10 °C >40 °C to 60 °C max.)
Altitude	1000 m (derate by 10 % >1000 m per 1000 m to 4000 m max.)
Protection	IP00, IP20 for versions with covering cap

Technical Characteristics

Product type	Power supply input [V..]	Output current (nominal/peak) [A]	Nominal output voltage [VDC]	Associated transformer (minimum power)
Panel mounting				
RTS 71 04- 301	32 VAC 1 ph. ±10 %	3/10	40	TT_11133
RTS 71 060 102R	48 VAC 1 ph. ±10 %	10/20	60	TT-11135
RTS 71 130 102R	100 VAC 1 ph. ±10 %	12/24	130	TT_11147
RTS 73 060 102R	48 VAC 3 ph. ±10 %	10/20	60	TT-11136
RTS 73 130 102R	100 VAC 3 ph. ±10 %	12/24	130	TT_11145
RTS 73 130 204R	100 VAC 3 ph. ±10 %	20/40	130	TT_11140
RTS 73 190 103R	135 VAC 3 ph. ±10 %	16/32	190	TT_11117
RTS 73 200 408R	150 VAC 3 ph. ±10 %	40/80	200	TT_11119
RTS 42 BA0 102	24-48 VDC battery	12/24	Ubatt-2	
RTS P2 BA0 204	24-48 VDC battery	20/40	Ubatt-2	
RTS 72 BA0 408	36-72 VDC battery	40/80	Ubatt-2	
Rack Mounting				
RTS 61 04- 301	32 VAC 1 ph. ±10 %	3/10	40	TT_11133
RTS 63 060 102R	48 VAC 3 ph. ±10 %	10/20	60	TT_11136
RTS 63 130 102R	100 VAC 3 ph. ±10 %	12/24	130	TT_11145
RTS 42 BA0 102	24-48 VDC battery	12/24	Ubatt-2	

All the RTS servo amplifiers are supplied with a RZ6602 setting board.

Dimensions



Product type / size	Height (2) [mm]	Width (1) [mm]	Depth (3) [mm]	Weight [kg]
Panel mounting				
RTS 71 04- 301	150	65	212	1
RTS 71 060 102R	180	65	212	1.1
RTS 71 130 102R	180	95	212	1.9
RTS 73 060 102R	149	65	212	1
RTS 73 130 102R	149	95	212	1.5
RTS 73 130 204R	149	121	221	1.9
RTS 73 190 103R	149	121	212	1.9
RTS 73 200 408R	275	139	229	6
RTS 42 BA0 102	149	65	212	1
RTS P2 BA0 204	149	65	212	1.5
RTS 72 BA0 408	275	70	229	2.5
Rack mounting				
RTS 61 04- 301	128.4	60.6	215	0.9
RTS 63 060 102R	128.4	60.6	215	0.9
RTS 63 130 102R	128.4	60.6	215	0.9
RTS 42 BA0 102	128.4	50.4	215	0.85

Accessories

Accessories	Description
TT_11133	0.12 kVA transformer 230/400 VAC primary 32 VAC 1 ph. ± 5 % secondary
TT_11134	0.63 kVA transformer 230/400 VAC primary 32 VAC 1 ph. ± 5 % secondary
TT_11135	0.63 kVA transformer 230/400 VAC primary 48 VAC 1 ph. ± 5 % secondary
TT_11136	0.5 kVA transformer 230/400 VAC primary 48 VAC 3 ph. ± 5 % secondary
TT_11137	1.6 kVA transformer 230/400 VAC primary 48 VAC 3 ph. ± 5 % secondary
TT_11138	2.5 kVA transformer 230/400 VAC primary 48 VAC 3 ph. ± 5 % secondary
TT_11147	1.6 kVA transformer 230/400 VAC primary 100 VAC 3ph. ± 5 % secondary
TT_11144	0.63 kVA transformer 230/400 VAC primary 100 VAC ± 5 % secondary
TT_11145	1 kVA transformer 230/400 VAC primary 100 VAC 3 ph. ± 5 % secondary
TT_11139	1.6 kVA transformer 230/400 VAC primary 100 VAC 3 ph. ± 5 % secondary
TT_11140	2.5 kVA transformer 230/400 VAC primary 100 VAC + 48 VAC 3 ph. ± 5 % secondary
TT_11141	4 kVA transformer 230/400 VAC primary 100 VAC + 48 VAC 3 ph. ± 5 % secondary
TT_11115	1 kVA transformer 230/400 VAC primary 135 VAC 3 ph. ± 5 % secondary
TT_11116	1.6 kVA transformer 230/400 VAC primary 135 VAC 3 ph. ± 5 % secondary
TT_11117	2.5 kVA transformer 230/400 VAC primary 135 VAC 3 ph. ± 5 % secondary
TT_11118	4 kVA transformer 230/400 VAC primary 135 VAC 3 ph. ± 5 % secondary
TT_11119	6.3 kVA transformer 230/400 VAC primary 135 VAC 3 ph. ± 5 % secondary
TT_11120	10 kVA transformer 230/400 VAC primary 135 VAC 3 ph. ± 5 % secondary
CZ463068	56 Ω 200 W Brake Resistor FC - one per phase - to be added with 10 kVA transformer
TP_83131	Cover for RTS 16/32 A & 20/40 A
TP_83132	Cover for RTS 3/10 A & 10/20 A - 60 VDC Three phase & 12/24 A battery
TP_83133	Cover for RTS 12/24 A - 130 VDC Three phase
TP_83138	Cover for RTS 10/20 A - 60 VDC Single phase
TP_83140	Cover for RTS 12/24 A - 130 VDC Single phase
RACE234	Rack RTS 3 U - 1 to 4 axis
RACE234V	22 Rack RTS 3 U - 1 to 4 axis with ventilation
RACE238	Rack RTS 3 U - 1 to 8 axis
RACE238V	32 Rack RTS 3 U - 1 to 8 axis with ventilation
TL_84032	Cover for rack RTS 81 mm
TL_84045	Cover for rack RTS 51 mm
RG_6601	Acceleration / deceleration board
RG_6602	Acceleration / deceleration board for RTS 40/80 A
SF_02022	Choke for RTS - 16 A - 2.5 mH (recommended for cables > 40 m)
SF_02023	Choke for RTS - 25 A - 1.5 mH (recommended for cables > 40 m)
SF_02024	Choke for RTS - 40 A - 1.25 mH (recommended for cables > 40 m)
SF_02031	Choke for RTS - 12 A - 1 mH (recommended for cables > 40 m)
FR_13020	20 A 1 ph. / 3 ph. input main filter

Order Code

	1	2	3	4	5
Order example	RTS	71	060	102	R

1 Type

RTS DC Servo Drive

2 Mounting type / power supply

71

73

42 see table "Technical Characteristics"

...

3 Output voltage

40 see table "Technical Characteristics"

60

130

...

4 Output current

102 see table "Technical Characteristics"

5 Brake resistance

R see table "Technical Characteristics"

Motors

Servo Motors

Spindle Motors

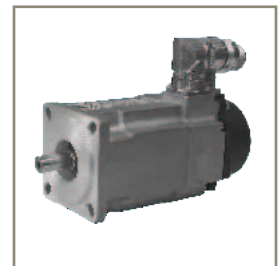
Stepper Motors / DC Servo Motors



SMB / SMH



MB / MH



NX



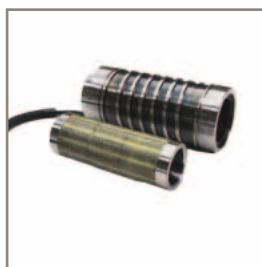
EX



NV



NK



SKW



HKW



TK



SY Stepper Motors



RS



RX



AXEM

Markets and Applications

Motors

Product	Image	Description	Markets												
			Food, Pharma & Beverage	Packaging Machines	Material Forming	Material Handling	Factory Automation	Life Science Diagnostic	Automotive Industry / In-Plant	Printing Industry	Textile Machines	Robotics	Tooling Machines	Servo Hydraulic Pumps	
SMB / SMH		Low Inertia Servo Motor	■	■	■	■	■	■	■	■	■	■	■	■	■
MB / MH		Servo Motor	■	■	■	■	■	■	■	■	■	■	■	■	■
NX		Low Cogging Servo Motor				■	■	■	■		■	■	■	■	
Motornet DC		Integrated Motor/Servo Drive	■	■	■	■	■			■	■	■			
EX		Explosion Proof Servo Motor	■		■		■			■	■		■		
NV		High Speed Servo Motor												■	
NK		Frameless Servo Motor							■	■			■	■	■
SKW		Frameless Spindle Motor												■	
HKW		Frameless AC Brushless Motor												■	
TK		Frameless Servo Motor			■	■								■	
SY Stepper		2-Phase Stepper Motor	■	■		■	■	■			■	■			
RS		High Performance DC Servo Motor						■	■			■			
RX		DC Servo Motor						■	■						
AXEM		Pancake DC Servo Motor						■	■			■			

	Pulp & Paper	Renewable Energy	Aerospace	Radiation Hardend	Marine	Continuous Process	Hazardous / Ex Environment	Simulation / Testing	Mobile Hybrid Solutions	Key Features
	■					■		■	■	<ul style="list-style-type: none"> • High dynamical • Low inertia • Multiple feedback devices <ul style="list-style-type: none"> • Option: Brake • Platform for customization
	■					■	■	■	■	<ul style="list-style-type: none"> • High dynamical • Low inertia • Multiple feedback devices <ul style="list-style-type: none"> • Option: Brake • Platform for customization
	■	■	■	■	■	■		■	■	<ul style="list-style-type: none"> • Smooth rotation • Low cogging • Option: sensorless <ul style="list-style-type: none"> • High torque density • Medium inertia
	■					■		■	■	<ul style="list-style-type: none"> • Servo Electronics integrated into the motor • Use in total de-centralized automation structures <ul style="list-style-type: none"> • Reduced cabelling needs • CANopen / EtherCAT communication
							■			<ul style="list-style-type: none"> • Explosion proof design / ATEX • Flameproof by UL <ul style="list-style-type: none"> • Compact, robust
										<ul style="list-style-type: none"> • Smooth rotation • Low cogging • High accuracy balanced <ul style="list-style-type: none"> • Low vibration • High torque density
									■	<ul style="list-style-type: none"> • Hollow shaft • Frameless design • Smooth rotation • Low cogging <ul style="list-style-type: none"> • Very compact / reduced weight • Direct drive
										<ul style="list-style-type: none"> • Compact design • High speed <ul style="list-style-type: none"> • Hollow shaft
									■	<ul style="list-style-type: none"> • Watercooled <ul style="list-style-type: none"> • High speed (up to 50 000 min⁻¹)
	■	■			■					<ul style="list-style-type: none"> • Hollow shaft • Frameless design • High torque direct drive (310 to 22 000 Nm) <ul style="list-style-type: none"> • High number of poles: 24 to 120 • Direct machine integration • Direct drive
										<ul style="list-style-type: none"> • Robust • Simple 2-phase design
				■						<ul style="list-style-type: none"> • Compact design • High dynamic <ul style="list-style-type: none"> • Smooth at low speed • Long life time
										<ul style="list-style-type: none"> • Compact design • High dynamic <ul style="list-style-type: none"> • Low speed smoothness • Long life time
					■					<ul style="list-style-type: none"> • Ultra compact housing • No cogging <ul style="list-style-type: none"> • Low speed smoothness • Robust

Main Functions

Product		Description	Low Inertia	Low Cogging	High Speed	Direct Drive	Resolver	Encoder	Absolute Feedback	Sensorless Option	Brake Option	Kit Option	Hollow Shaft Option	Water Cooling Option
SMB / SMH		Low Inertia Servo Motor	■				■	■	■	■	■	■		
MB / MH		Servo Motor	■				■	■	■		■	■		
NX		Low Cogging Servo Motor		■			■	■	■	■	■			
Motornet DC		Integrated Motor/ Servo Drive	■				■	■	■		■			
EX		Explosion Proof Servo Motors		■			■	■	■		■			
NV		High Speed Servo Motor		■	■		■	■			■			
NK		Frameless Servo Motor		■		■	■	■	■		■	■		■
SKW		Frameless Spindle Motor	■		■	■	■	■			■	■	■	■
HKW		Frameless AC Brushless Motor	■		■	■	■	■				■	■	■
TK		Frameless Servo Motor		■		■		■	■			■	■	■
SY		2-Phase Stepper Motor		■				■		■				
RS		High Performance DC Servo Motors	■	■				■		■	■			
RX		DC Servo Motor		■				■		■	■			
AXEM		Pancake DC Servo Motor	■	■				■		■	■			

	Integrated Electronics	Customization Platform	Explosion Proof	Speed [min ⁻¹]		Torque [Nm]	
		■		7500	■	17	■
		■	■	10000	■	285	■
		■		8900	■	64	■
	■			6000	■	8	■
			■	8000	■	35	■
	■			17000	■	11.5	■
				8000	■	72	■
				12000	■	24.4	■
				50000	■	1800	■
				835	■	21000	■
				800	■	13	■
	■			3000	■	13	■
	■			3000	■	8	■
				4800	■	20	■

Motors

Low Inertia Servo Motors - SMB / SMH

Overview

Description

The SMB / SMH* Series of highly-dynamic brushless servo motors have been design to combine the cutting-edge technology of Parker Hannifin products with an extremely high performance.

Thanks to the innovative "salient pole" technology, the motor's dimensions are considerably reduced with significant advantages in terms of specific torque, overall dimensions and dynamic performance. Compared to traditional-technology brushless servo motors, the specific torque is approximately 30 % higher, overall dimensions are considerably reduced and, consequently rotor inertias are extremely low. Thanks to the high quality of Neodymium-Iron-Boron magnets, and also the encapsulation method used to fasten them to the shaft, the SMB/H motors can achieve very high acceleration and withstand high overloads without risk of demagnetisation or detachment of the magnets.

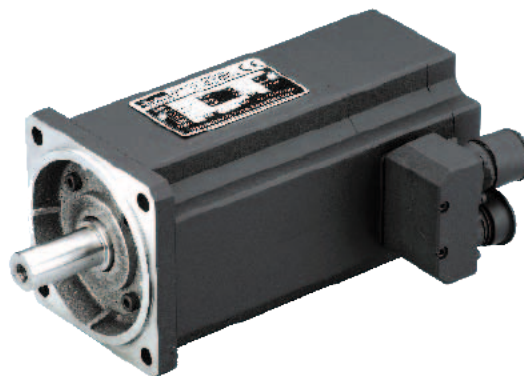
Specific applications for the SMB/H Series include all types especially those for the packaging and handling industry, and all those applications where very high dynamic performances and very low inertias are required.

Features

- High number of feedback options
- Customised windings/voltages
- Increased Inertia option
- Multiple connection options

Application

- Food, Pharma & Beverage
- Packaging Machines
- Material Forming
- Material Handling
- Factory Automation
- Life Science Diagnostic
- Automotive Industry / In-Plant
- Printing Industry
- Textile Machines
- Robotics
- Servo Hydraulic Pumps



Technical Characteristics - Overview

Motor Type	Permanent magnets synchronous servomotor
Rotor Design	Rotor with surface rare earth magnets
Number of poles	10 for SM_ 42 8 for SM_ 60-82-100-115-142
Power Range	0.2 – 5.3 kW
Torque Range	0.35 – 17 Nm
Speed Range	0 – 7500 min ⁻¹
Mounting	Flange with smooth holes
Shaft End	Plain keyed shaft Plain smooth shaft (option)
Cooling	Natural ventilation
Protection Level (IEC60034-5)	IP64 IP65 (option)
Feedback sensor	Resolver Absolute Endat or Hiperface Incremental Encoder
Other options	Brake Thermal protection (PTC for SMB and KTY for SMH) Increased inertia
Marking	CE / UL
Voltage Supply	230 / 400 VAC other voltage uder request
Temperature Class	Class F
Connections	Connectors Flying cables Terminal Box (see table option for combination)

* SMB: for Drives TPD-M, SLVD-N, TWIN-N, SPD-N, Hi-Drive
SMH: for Drive Compax3

Technical Characteristics

Technical Data

230 VAC supply voltage

Model ⁽⁴⁾	Size	Stall ⁽¹⁾		Nominal ⁽¹⁾			Peak ⁽¹⁾	Inertia		Ke ^{(2) (3)}	Kt ^{(2) (3)}
		Torque	Current	Torque	Speed	Current	Torque	No brake	With brake		
		T ₀₆₅ (T ₁₀₅) [Nm]	I ₀₆₅ [A]	T _{n065} [Nm]	n [min ⁻¹]	I _{n065} [A]	T _{max} [Nm]	J [kgmm ²]	J [kgmm ²]	Ke [Vs]	Kt [Nm/A _{rms}]
SM_42 60 0,35	42	0.35 0.45	0.78	0.15	6000	0.38	0.9	13	n.a.	0.29	0.46
SM_60 30 0,55	60	0.55 (0.68)	0.7	0.50	3000	0.66	1.7	18	30.5	0.44	0.76
SM_60 45 0,55			1.0	0.39	4500	0.74				0.30	0.53
SM_60 60 0,55			1.4	0.24	6000	0.60				0.23	0.40
SM_60 16 1,4		1.4 (1.7)	0.95	1.35	1600	0.91	4.4	30	42.5	0.85	1.48
SM_60 30 1,4			1.73	1.20	3000	1.50				0.47	0.81
SM_60 45 1,4			2.37	1.00	4500	1.69				0.34	0.59
SM_60 60 1,4			2.98	0.80	6000	1.70				0.27	0.47
SM_60 75 1,4			3.85	0.15	7500	0.41				0.21	0.36
SM_82 10 03	82	3 (3.7)	1.2	2.9	1000	1.2	9	140	183	1.43	2.48
SM_82 16 03			1.8	2.9	1600	1.7				0.96	1.66
SM_82 30 03			3.1	2.7	3000	2.8				0.55	0.96
SM_82 33 03			3.5	2.4	3300	2.8				0.49	0.85
SM_82 45 03			4.7	2.2	4500	3.4				0.37	0.64
SM_82 60 03			6.1	1.5	6000	3.1				0.28	0.49
SM_82 75 03			7.5	0.6	7500	1.6				0.23	0.40
SM_100 16 06	100	6 (9)	3.7	5.8	1600	3.6	18	336	440	0.92	1.60
SM_100 30 06			5.9	5.0	3000	4.9				0.59	1.02
SM_100 45 06			9.4	3.5	4500	5.5				0.37	0.64
SM_100 55 06			11.8	2.6	5500	5.1				0.29	0.51
SM_100 75 06			14.7	0.6	7500	1.5				0.24	0.41
SM_115 16 10	115	10 (12.5)	6.0	9.0	1600	5.4	32	900	1000	0.96	1.66
SM_115 30 10			10.5	8.0	3000	8.4				0.55	0.95
SM_115 40 10			14.7	7.6	4000	11.2				0.39	0.68
SM_115 54 10			18.2	7.1	5400	12.9				0.32	0.55
SM_142 18 15	142	15 (19)	9.7	13.3	1800	8.6	47	1400	1600	0.89	1.54
SM_142 30 15			16.0	12.5	3000	13.4				0.54	0.94

⁽¹⁾ Data referred to motor mounted on a steel flange in horizontal position with dim. 200x230x20 mm (for SM_60,82), dim. 200x270x20 mm (for SM_100,115,142). Stall torques refer to motor turning at 100 min⁻¹

⁽²⁾ Data measured at 20 °C. When "hot" consider -0.09 %/K derating

⁽³⁾ Tolerance data ±10 %

⁽⁴⁾ SMB: for Drives TPD-M, SLVD-N, Twin-N, SPD-N, Hi-Drive
 SMH: for Drive Compax3

400 VAC power supply

Model ⁽⁴⁾	Size	Stall ⁽¹⁾		Nominal ⁽¹⁾			Peak ⁽¹⁾	Inertia		Ke ^{(2) (3)}	Kt ^{(2) (3)}
		Torque	Current	Torque	Speed	Current	Torque	No brake	With brake		
		T ₀₆₅ (T ₁₀₅) [Nm]	I ₀₆₅ [A]	T _{n065} [Nm]	n [min ⁻¹]	I _{n065} [A]	T _{max} [Nm]	J [kgmm ²]	J [kgmm ²]	Ke [Vs]	Kt [Nm/A _{rms}]
SM_60 30 1,4	60	1.4 (1.7)	0.95	1.2	3000	0.81	4.4	30	42.5	0.81	1.48
SM_60 45 1,4			1.37	1.0	4500	0.98				0.59	1.02
SM_60 60 1,4			1.73	0.8	6000	0.99				0.68	0.81
SM_60 75 1,4			2.15	0.15	7500	0.23				0.38	0.65
SM_82 30 03	82	3 (3.7)	1.8	2.7	3000	1.6	9	140	183	0.96	1.66
SM_82 45 03			2.7	2.2	4500	2.0				0.64	1.11
SM_82 56 03			3.1	1.6	5600	1.7				0.55	0.96
SM_82 60 03			3.5	1.7	6000	2.0				0.49	0.85
SM_82 75 03			4.4	0.6	7500	0.9			0.39	0.68	
SM_100 30 06	100	6 (9)	3.7	5.0	3000	3.1	18	336	440	0.92	1.60
SM_100 45 06			5.6	3.5	4500	3.3				0.62	1.07
SM_100 56 06			5.9	2.5	5600	2.4				0.59	1.02
SM_100 75 06			9.4	0.6	7500	0.9				0.37	0.64
SM_115 20 10	115	10 (12.5)	4.5	9.0	2000	4.06	32	900	1000	1.28	2.22
SM_115 30 10			6.0	8.0	3000	4.82				0.96	1.66
SM_115 40 10			8.0	7.6	4000	6.05				0.73	1.26
SM_115 56 10			10.5	6.0	5600	6.30				0.55	0.95
SM_142 20 15	142	15 (19)	6.4	13.0	2000	5.5	47	1400	1600	1.36	2.35
SM_142 30 15			9.7	12.5	3000	8.1				0.89	1.54
SM_142 45 15			14.4	10.9	4500	10.5				0.60	1.04
SM_142 56 15		16.0	9.2	5600	9.8	0.54	0.94				
SM_142 10 17		17 (21)	3.5	16.4	1000	3.4	54			2.83	4.90
SM_142 30 17			9.6	14.0	3000	8.1				1.02	1.77
SM_142 56 17	15.8		10.6	5600	9.8	0.62		1.08			
SM_170 10 36	170	available on request									
SM_170 27 36											

⁽¹⁾ Data referred to motor mounted on a steel flange in horizontal position with dim. 200x230x20 mm (for SM_60,82), dim. 200x270x20 mm (for SM_100,115,142). Stall torques refer to motor turning at 100 min⁻¹

⁽²⁾ Data measured at 20 °C. When "hot" consider -0.09 %/K derating


⁽³⁾ Tolerance data ±10 %

⁽⁴⁾ SMB: for Drives TPD-M, SLVD-N, Twin-N, SPD-N, Hi-Drive
SMH: for Drive Compax3

STANDARDS

In compliance with: 2006/95 EC

- EN60034-1
- EN60034-5
- EN60034-5/A1

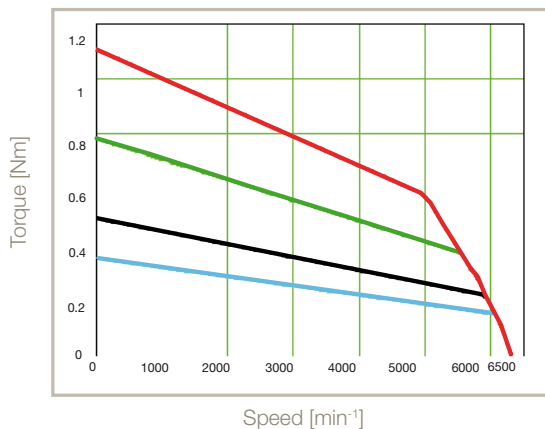
Marked  Marked  (except SM_42)

Motors
SMB / SMH Series

Speed Torque Curves

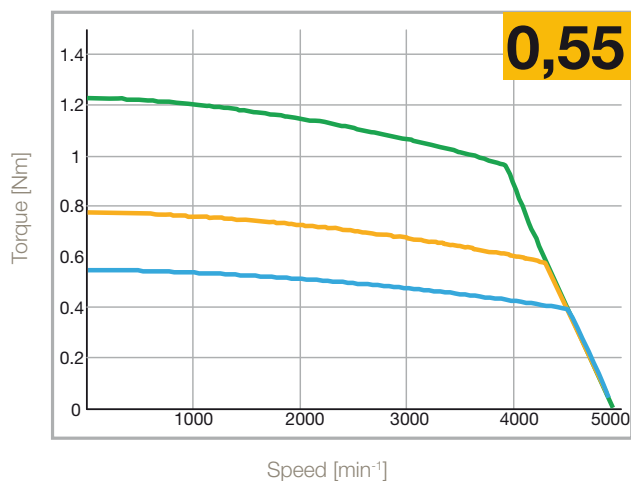
SMB/H42

6000 min⁻¹ 230 V

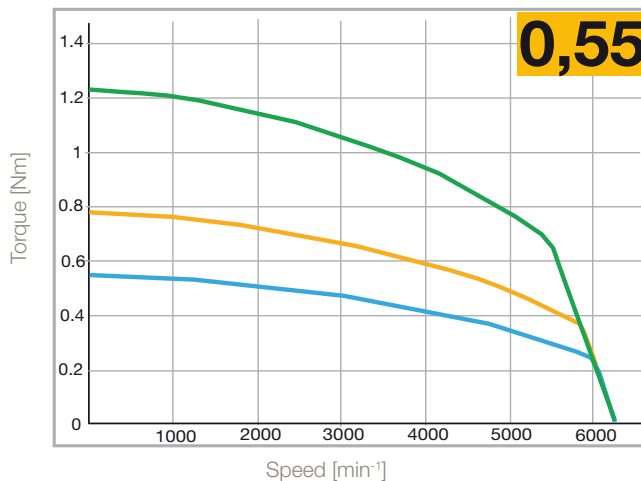


SMB/H60

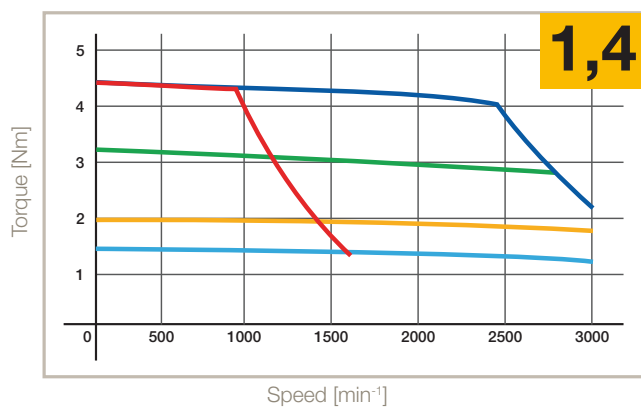
4500 min⁻¹ 230 V



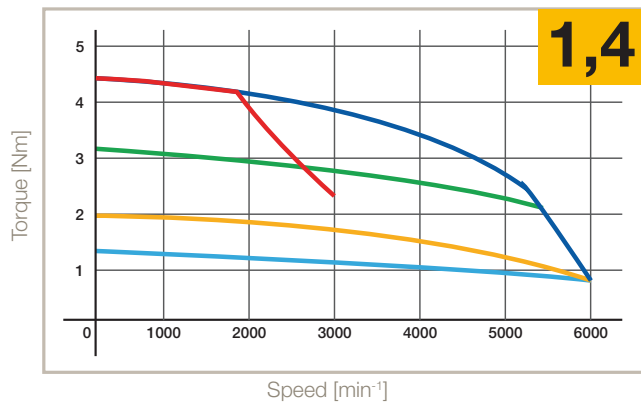
6000 min⁻¹ 230 V



1600 min⁻¹ 230 V - 3000 min⁻¹ 400 V



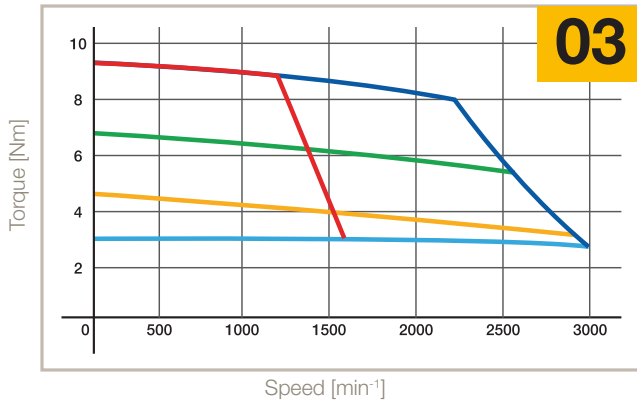
3000 min⁻¹ 230 V - 6000 min⁻¹ 400 V



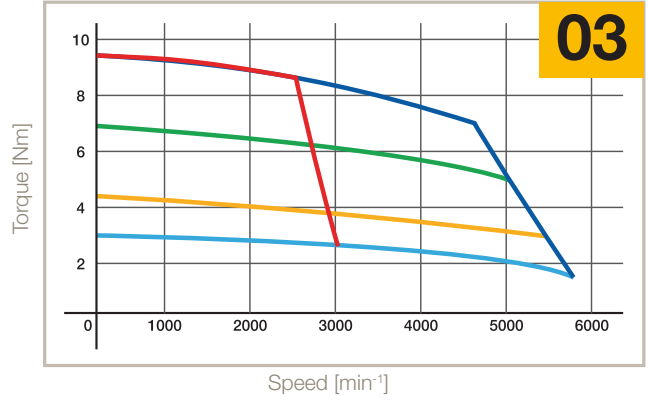
- S1 65 K, ΔT
- S3 10 %, 5 min, 230 V
- S3 10 %, 5 min, 400 V
- S3 50 %, 5 min
- S3 50 %, 5 min
- S3 20 %, 5 min

SMB/H82

1600 min⁻¹ 230 V - 3000 min⁻¹ 400 V

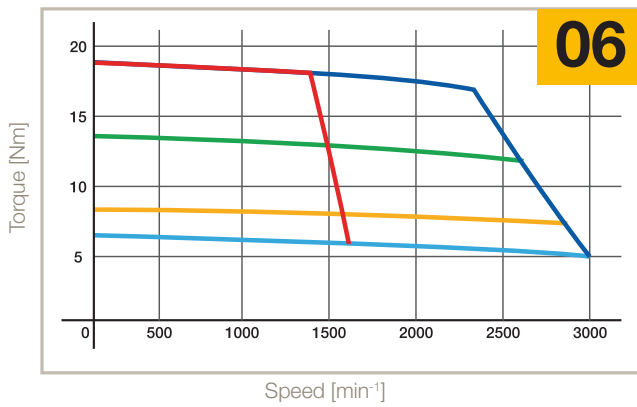


3000 min⁻¹ 230 V - 5600 min⁻¹ 400 V

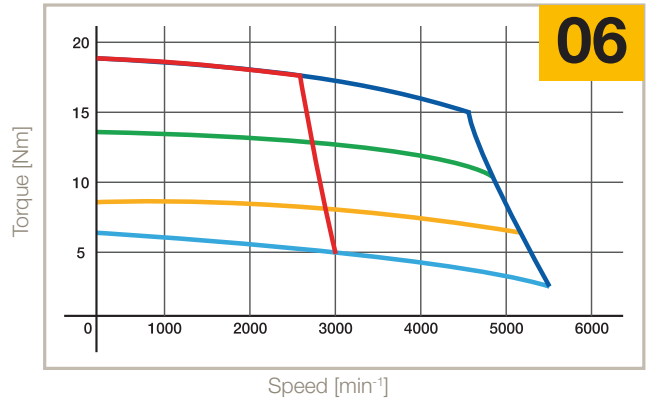


SMB/H100

1600 min⁻¹ 230 V - 3000 min⁻¹ 400 V

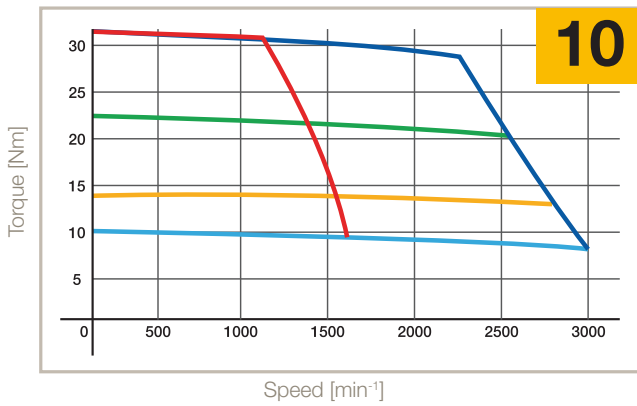


3000 min⁻¹ 230 V - 5600 min⁻¹ 400 V

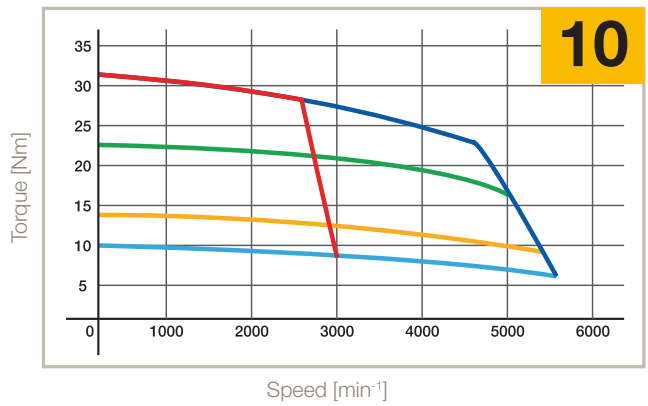


SMB/H115

1600 min⁻¹ 230 V - 3000 min⁻¹ 400 V



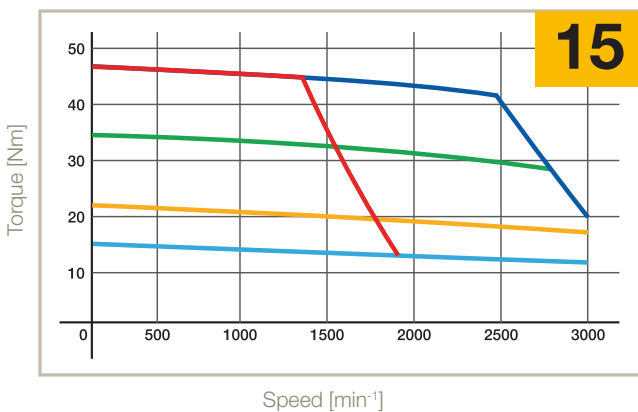
3000 min⁻¹ 230 V - 5600 min⁻¹ 400 V



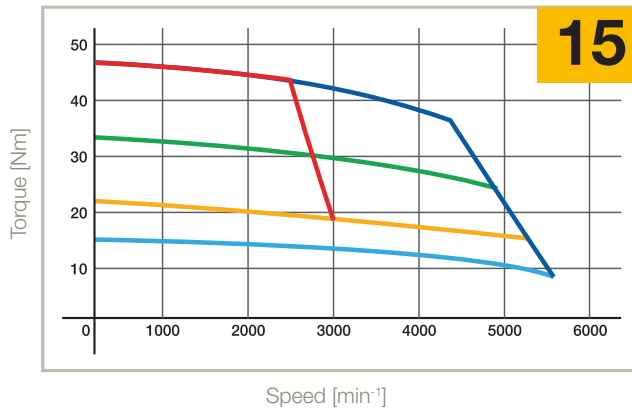
- S1 65 K, ΔT
- S3 10 %, 5 min, 400 V
- S3 50 %, 5 min
- S3 10 %, 5 min, 230 V
- S3 50 %, 5 min
- S3 20 %, 5 min

SMB/H142

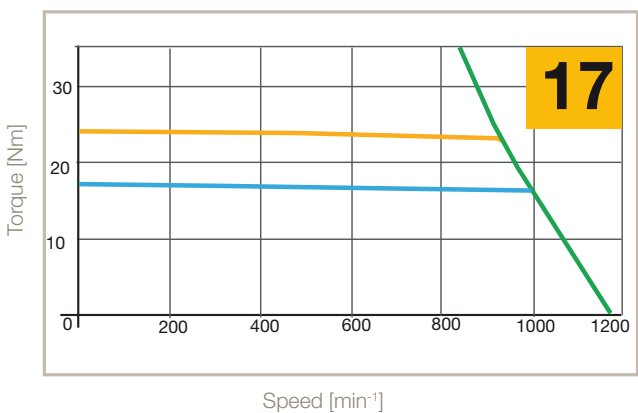
1800 min⁻¹ 230 V - 3000 min⁻¹ 400 V



3000 min⁻¹ 230 V - 5600 min⁻¹ 400 V

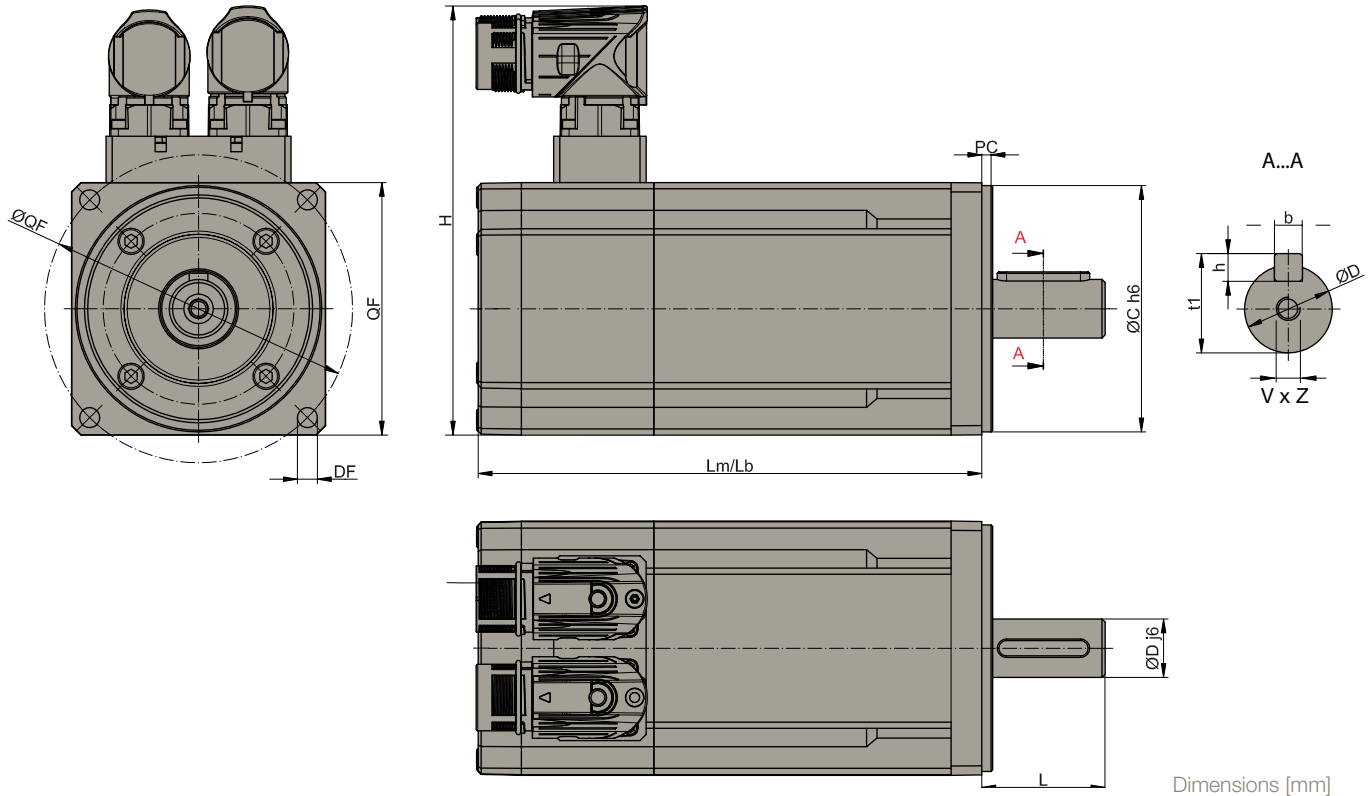


1000 min⁻¹ 400 V



- S1 65 K, ΔT
- S3 10 %, 5 min, 400 V
- S3 50 %, 5 min
- S3 10 %, 5 min, 230 V
- S3 50 %, 5 min
- S3 20 %, 5 min

Dimensions of Standard Motors with Resolver Feedback



Motors
SMB / SMH Series

Dimensions [mm]

Motors Size		LM LB	Weight [kg]	DxL	bxh	t1	VxZ	H	C	ØQF	F	DF	PC	QF	Order Code QF	
SMB /H	42	0,35	110	0.85	9x25	-	-	M3x9	66	30	50	3.2	2.5	42	5	
	60	0,55	88	-	9x20	3x3	10.2	-	111.5	40	63	63	5.5	-	60	8
			137	1	11x23	4x4	12.5	M4x10		60	75	75	6	2.5	70	5
		1,4	129.5 161	1.5	9x20 11x23	3x3 4x4	10.2 12.5	M4x10		40	63	63	5.5	2.5	60	8
	82	03	159	3.6	11x23 ⁽²⁾	4x4	12.5	M4x12	140	60	75	75	6	3.5	70	7
			202	3.6	14x30	5x5	16	M4x12		80	100	100	6.5	3.5	82	8
			163.5 206.5	3.6	14x30 19x40 ⁽¹⁾	6x6	21.5	M5x12.5 M6x16		95	115	115	9	3.5	100	5
	100	06	191.5	4.7	19x40	6x6	21.5	M6x16	157.5	80	100	100	7	3.5	100	8
			238.5	4.7	24x50	8x7	27	M8x19		95	115	115	9	3.5	100	5
	115	10	220 265	7.7	19x40	6x6	21.5	M6x16	172	95	115	115	9	3.5	115	9
					24x50	8x7	27	M8x19		95	130	130	9	3.5	115	8
					28x60	8x7	31	M10x22		110	130	130	9	3.5	130	7
					28x60	8x7	31	M10x22		130	165	165	11	3.5	145	5
	142	15	243 293	13	19x40 24x50 28x60	6x6 8x7 8x7	21.5 27 31	M6x16 M8x19 M10x22	199	130	165	165	11	3.5	142	5

LM: Motor's length without brake and with resolver
LB: Motor's length with brake and resolver
DxL: Shaft
bxh: Key
T1: Overall shaft height
VxZ: Shaft hole depth
H: Height

C: Center
DF: Fixing holes
QF: Mounting flange
F: Pitch circle diameter
PC: Centre Depth
⁽¹⁾ not available with flange 7
⁽²⁾ only for torque <2 Nm

Options

Parker SMB / SMH family motors are available with standard and custom options to adapt motor on your application. If the option for your application is not listed, please consult our technical department.

Holding Brake

All SMB / SMH motors are available with option holding brake.

The fail-safe (supply voltage 24 VDC $\pm 10\%$) holding brake is incorporated in the motor at the opposite side of the front flange and is applied when there is no voltage present. Because of the power loss caused by the brake, torque values must be reduced by 5 %. The holding brakes shall be used with the motor at a standstill and not for dynamic braking. For normal uses, they are maintenance free brakes.

Motor	Voltage [V]	Current [A]	Torque @20 °C [Nm]	Added Length [mm]	Added Weight [kg]	Added Inertia [kgmm ²]
SMB / SMH60	24	0.34	2.2	31.5	0.3	12.5
SMB / SMH82	24	0.5	5	43	0.7	43
SMB / SMH100	24	0.67	11	47	0.6	104
SMB / SMH115	24	0.67	11	45	2	100
SMB / SMH142	24	0.75	22	50	3	200

Medium Inertia

Where the application needs different values of inertia, SMB / SMH can provide a standard adder.

Motor	Added inertia [kgmm ²]	Added length [mm]	Added weight [kg]
SMB / SMH60	29	31.5	0.32
SMB / SMH82	270	43	0.91
SMB / SMH100	284	47	0.68
SMB / SMH115	900	45	2.28
SMB / SMH142	690	50	2.49

Feedback

Motors may be equipped with various feedback types in order to meet the different requirements for precision, signal that the application needs. The standard motor includes the resolver feedback. Hiperface Encoder, DSL Encoder, EnDat Encoder, Incremental Encoder are available like the following tables.

Resolver

Poles	2
Transformation ratio	0.5
Operating temperature	-50...+150 °C
SM_ associations	All Sizes

Incremental Encoder with Hall Sensor

Code	A1	A2	A3	B3	C4	D3
Resolution [C/T]	2000	2048	4096	2048	5000	5000
Poles	8					
System accuracy	$\pm 32''$	$\pm 32''$	$\pm 16''$	$\pm 32''$	$\pm 13''$	$\pm 13''$
Voltage	+5 VDC $\pm 5\%$ - 200 mA					
Reference mark	Yes					
Max speed [min ⁻¹]	6000					
Output circuit	Line drive differential mode 20 mA					
Operating temperature	-20 °C...+100 °C	-20 °C...+85 °C	-20 °C...+100 °C	-20 °C...+100 °C	-20 °C...+85 °C	-20 °C...+85 °C
SM_ motors associations						
SM_42	N	N	N	N	N	N
SM_60	N	N	N	Y (+17 mm length)	N	Y (+17 mm length)
SM_82	Y	Y	Y	N	Y	N
SM_100	Y	Y	Y	N	Y	N
SM_115	Y	Y	Y	N	Y	N
SM_142	Y	Y	Y	N	Y	N

Hiperface Absolute Encoder

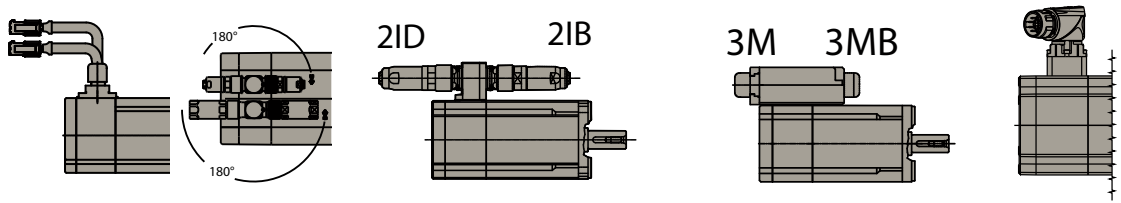
Code	S1	S2	S3	S4	A6	A7
Type	Optical					
Turn	Single	Multi	Single	Multi	Single	Multi
Incremental signals	1 V _{PP}					
Line count	1024		128		1024	
Resolution	32 768 (15 bit)		4096 (12 bit)		32 768 (15 bit)	
Absolute rotation	1	4096	1	4096	1	4096
System accuracy	±45"		±320"		±45"	
Power supply	8 VDC					
Max speed [min ⁻¹]	6000		12 000	9000	6000	
Temperature	-20 °C...+115 °C		-20 °C...+110 °C		-20 °C...+115 °C	
Safety integrity level	SIL2 (IEC 61508), SILCL2 (IEC 62061)				Not Available	
SM_ motors associations						
SM_42	N	N	N	N	N	N
SM_60	Y (+33.5 mm length, 82 mm rear flange)		Y (+17 mm length)		Y (+33.5 mm length, 82 mm rear flange)	
SM_82	Y (+22 mm length)		Y	Y	Y (+22 mm length)	
SM_100	Y (+20 mm length)		Y (+20 mm length)		Y (+20 mm length)	
SM_115	Y	Y	Y	Y	Y	Y
SM_142	Y	Y	Y	Y	Y	Y
Code	C6	C7	G4	S5	S6	
Type	Optical		Capacitive	Optical		
Turn	Single	Multi	Multi	Single	Multi	
Incremental signals	1 V _{PP}			-	-	
Line count	128		16	-	-	
Resolution	4096 (12 bit)			262 144 (18 bits)		
Absolute rotation	1	4096	512	1	4096	
System accuracy	±320"		±288"	±40"		
Power supply	8 VDC			7...12 VDC		
Max speed [min ⁻¹]	12 000	9000	6000			
Temperature	-20 °C...+110 °C		-20 °C...+115 °C	20 °C...+105 °C		
Safety integrity level	Not Available			SIL2 (IEC 61508), SILCL2 (IEC 62061)		
SM_ motors associations						
SM_42	N	Y ²⁾	N	N	N	
SM_60	Y (+10 mm length)		Y	Y (+10 mm length)		
SM_82	Y	Y	N	Y	Y	
SM_100	Y (+20 mm length)		N	Y (+20 mm length)		
SM_115	Y	Y	N	Y	Y	
SM_142	Y	Y	N	Y	Y	

¹⁾+10 mm length, 56 mm rear flange

EnDat Absolute Encoder

Code	B9	C1	D5	F2	F4
Type	Inductive	Optical			Inductive
Turn	Multi	Single	Multi		
Incremental signals	1 V _{PP}				
Line count	32	512			16
Positions per revolutions	131 072 (17 bit)	8192 (13 bit)			262 144 (18 bit)
Distinguishable revolutions	4096	1	4096		
System accuracy	±400"	±60"			±480"
Power supply	5 VDC				
Max speed [min ⁻¹]	12000		7000	12000	
Temperature	-20 °C...+115 °C	-40 °C...+115 °C	-30 °C...+115 °C	-40 °C...+115 °C	-20 °C...+115 °C
Absolute position values	EnDat 2.1	EnDat 2.2			EnDat 2.1
Safety integrity level	Not Available				
SM_ motors associations					
SM_42	N	N	N	N	N
SM_60	Y (+33.5 mm length, 82 mm rear flange)		N	Y (+20 mm length)	Y (+20 mm length)
SM_82	Y (+24 mm length)			N	N
SM_100	Y (+20 mm length)			N	N
SM_115	Y	Y	Y	N	N
SM_142	Y	Y	Y	N	N

Layout and Connectors



	200 mm Flying leads with molex plugs 0V	2x Parallel upright connectors 2I	2x Forward facing connectors 2IB	2x Rear facing connectors 2ID	Terminal box rear facing 3M	Terminal box forward facing 3MB	Hiperface DSL® Connector (IZ)
SMB_42	Y	N	N	N	N	N	N
SMB_60	Y	Y	Y	Y	Y	Y	N
SMB_82	N	Y	Y	Y	Y	Y	N
SMB_100	N	Y	Y	Y	Y	Y	N
SMB_115	N	Y	Y	Y	Y	Y	N
SMB_142	N	Y	Y	Y	Y	Y	N
SMH_42	Y	N	N	N	N	N	N
SMH_60	Y	Y	Y	N	N	N	N
SMH_82	N	Y	Y	N	N	N	N
SMH_100	N	Y	Y	N	N	N	N
SMH_115	N	Y	Y	N	N	N	N
SMH_142	N	Y	Y	N	N	N	N
SME_42	Y	N	N	N	N	N	Y
SME_60	N	N	Y	Y	N	N	Y
SME_82	N	N	Y	Y	N	N	Y
SME_100	N	N	Y	Y	N	N	Y
SME_115	N	Y	N	N	N	N	Y
SME_142	N	Y	N	N	N	N	Y

Power connector (0V)

6	5	4
3	2	1

Pin	Description
1	GND - shield
2	Brake 0 VDC
3	Brake +24 VDC
4	W
5	V
6	U

Absolute encoder SINCOS - Hiperface (0V)

Resolver connector (0V)

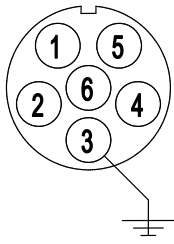
12	11	10	9	8	7
6	5	4	3	2	1

Pin	Description
1	n.c.
2	n.c.
3	n.c.
4	PTC
5	PTC
6	GND - shield
7	SIN +
8	SIN -
9	COS +
10	COS -
11	EXTC -
12	EXTC +

12	11	10	9	8	7
6	5	4	3	2	1

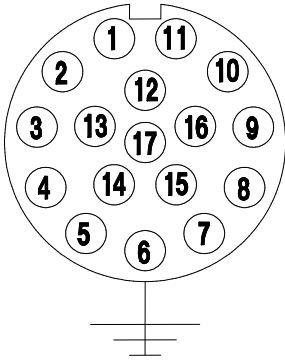
Pin	Description
1	SIN +
2	SIN -
3	RS485 +
4	0 V
5	PTC
6	PTC
7	+ VDC
8	COS +
9	COS -
10	RS485 -
11	GND - shield
12	n.c.

Power connector (2I, 2IB, 2D)



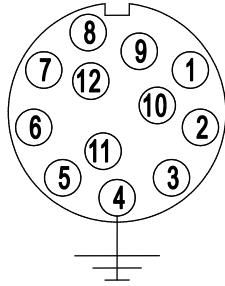
Pin	Description
1	U
2	V
3	GND - shield
4	Brake +24 VDC
5	Brake 0 VDC
6	W

Incremental encoder connector (2I, 2IB, 2D)



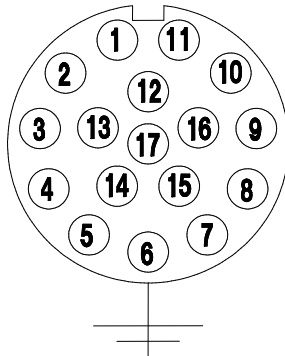
Pin	Description	
1	5 V	
2	0 V	
3	A +	
4	A -	
5	B +	
6	B -	
7	Z +	
8	PTC	KTY -
6	PTC	KTY +
10	Z -	
11	Hall A +	
12	Hall A -	
13	Hall B +	
14	Hall B -	
15	Hall C +	
16	Hall C -	
17	n.c.	

Resolver connector (2I, 2IB, 2D)



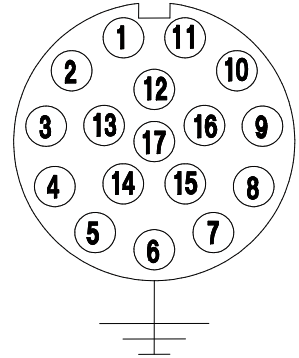
Pin	Description	
1	SIN -	
2	SIN +	
3	n.c.	
4	GND - shield	
5	n.c.	
6	n.c.	
7	EXCT -	
8	PTC	KTY -
9	PTC	KTY +
10	EXCT +	
11	COS +	
12	COS -	

Absolute encoder SINCOS - EnDat (2I, 2IB, 2D)



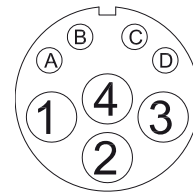
Pin	Description	
1	UP Sensor	
2	n.c.	
3	n.c.	
4	0 V Sensor	
5	PTC	KTY -
6	PTC	KTY +
7	UP	
8	CK +	
9	CK -	
10	0 V	
11	GND - shield	
12	B +	
13	B -	
14	Data +	
15	A +	
16	A -	
17	Data -	

Absolute encoder SINCOS - Hiperface (2I, 2IB, 2D)



Pin	Description	
1	SIN +	
2	SIN -	
3	RS485 +	
4	n.c.	
5	n.c.	
6	n.c.	
7	GND - shield	
8	PTC	KTY -
9	PTC	KTY +
10	+ VDC	
11	COS +	
12	COS -	
13	RS485 -	
14	n.c.	
15	n.c.	
16	n.c.	
17	n.c.	

Hiperface DSL® Connector (IZ)



Pin	Description
1	U
2	GND
3	V
4	W
A	Brake +
B	Brake -
C	Signal +
D	Signal -

Associated Drives

Motor	Rated Speed [min ⁻¹]	Stall Current [A]	SLVD-N	TPD-M	Compax3	638
230 VAC supply voltage						
SM_42 60 0,35	6000	0.78	SLVD1N...	TPD-M02...	C3S025V2...	638A-01-3-F...
SM_60 30 0,55	3000	0.7	SLVD1N...	TPD-M02...	C3S025V2...	638A-01-3-F...
SM_60 45 0,55	4500	1	SLVD1N...	TPD-M02...	C3S025V2...	638A-01-3-F...
SM_60 60 0,55	6000	1.4	SLVD2N...	TPD-M02...	C3S025V2...	638A-02-3-F...
SM_60 16 1,4	1600	0.95	SLVD1N...	TPD-M02...	C3S025V2...	638A-01-3-F...
SM_60 30 1,4	3000	1.73	SLVD2N...	TPD-M02...	C3S025V2...	638A-02-3-F...
SM_60 45 1,4	4500	2.37	SLVD5N...	TPD-M05...	C3S063V2...	638A-04-3-F...
SM_60 60 1,4	6000	2.98	SLVD5N...	TPD-M05...	C3S063V2...	638A-04-3-F...
SM_60 75 1,4	7500	3.85	SLVD5N...	TPD-M05...	C3S063V2...	638A-04-3-F...
SM_82 10 03	1000	1.2	SLVD2N...	TPD-M02...	C3S025V2...	638A-02-3-F...
SM_82 16 03	1600	1.8	SLVD2N...	TPD-M02...	C3S025V2...	638A-02-3-F...
SM_82 30 03	3000	3.1	SLVD5N...	TPD-M05...	C3S063V2...	638A-04-3-F...
SM_82 33 03	3300	3.5	SLVD5N...	TPD-M05...	C3S063V2...	638A-04-3-F...
SM_82 45 03	4500	4.7	SLVD5N...	TPD-M05...	C3S063V2...	638A-06-3-F...
SM_82 60 03	6000	6.1	SLVD7N...	TPD-M08...	C3S063V2...	638B-08-3-F...
SM_82 75 03	7500	7.5	SLVD7N...	TPD-M08...	C3S100V2...	638B-08-3-F...
SM_100 16 06	1600	3.7	SLVD5N...	TPD-M05...	C3S063V2...	638A-04-3-F...
SM_100 30 06	3000	5.9	SLVD7N...	TPD-M08...	C3S063V2...	638A-06-3-F...
SM_100 45 06	4500	9.4	SLVD10N...	TPD-M10...	C3S100V2...	638B-10-3-F...
SM_100 55 06	5500	11.8	SLVD15N...	TPD-M15...	C3S150V2...	638B-15-3-F...
SM_100 75 06	7500	14.7	SLVD15N...	TPD-M15...	C3S150V2...	638B-15-3-F...
SM_115 16 10	1600	6	SLVD7N...	TPD-M08...	C3S063V2...	638A-06-3-F...
SM_115 30 10	3000	10.5	SLVD10N...	TPD-M10...	C3S100V2...	638B-10-3-F...
SM_115 40 10	4000	14.7	SLVD15N...	TPD-M15...	C3S150V2...	638B-15-3-F...
SM_115 54 10	5400	18.2	n.a.	TPD-M30...	n.a.	n.a.
SM_142 18 15	1800	9.7	SLVD10N...	TPD-M10...	C3S100V2...	638B-10-3-F...
SM_142 30 15	3000	16	SLVD17N...	TPD-M30...	n.a.	n.a.

400 VAC supply voltage						
SM_60 30 1,4	3000	0.95	SPD2N.. / TWIN2N	TPD-M02..	C3S015V4..	638B-03-6-F...
SM_60 45 1,4	4500	1.37	SPD2N.. / TWIN2N	TPD-M02..	C3S015V4..	638B-03-6-F...
SM_60 60 1,4	6000	1.73	SPD2N.. / TWIN2N	TPD-M02..	C3S038V4..	638B-03-6-F...
SM_60 75 1,4	7500	2.15	SPD5N.. / TWIN5N	TPD-M05..	C3S038V4..	638B-03-6-F...
SM_82 30 03	3000	1.8	SPD2N.. / TWIN2N	TPD-M02..	C3S038V4..	638B-03-6-F...
SM_82 45 03	4500	2.7	SPD5N.. / TWIN5N	TPD-M05..	C3S038V4..	638B-05-6-F...
SM_82 56 03	5600	3.1	SPD5N.. / TWIN5N	TPD-M05..	C3S038V4..	638B-05-6-F...
SM_82 60 03	6000	3.5	SPD5N.. / TWIN5N	TPD-M05..	C3S038V4..	638B-05-6-F...
SM_82 75 03	7500	4.4	SPD5N.. / TWIN5N	TPD-M05..	C3S075V4..	638B-05-6-F...
SM_100 30 06	3000	3.7	SPD5N.. / TWIN5N	TPD-M05..	C3S038V4..	638B-05-6-F...
SM_100 45 06	4500	5.6	SPD8N.. / TWIN8N	TPD-M08..	C3S075V4..	638B-08-6-F...
SM_100 56 06	5600	5.9	SPD8N.. / TWIN8N	TPD-M08..	C3S075V4..	638B-08-6-F...
SM_100 75 06	7500	9.4	SPD16N..		C3S150V4..	638B-10-6-F...
SM_115 20 10	2000	4.5	SPD5N.. / TWIN5N	TPD-M05..	C3S075V4..	638B-05-6-F...
SM_115 30 10	3000	6.0	SPD8N.. / TWIN8N	TPD-M08..	C3S075V4..	638B-08-6-F...
SM_115 40 10	4000	8.0	SPD8N.. / TWIN8N	TPD-M08..	C3S150V4..	638B-10-6-F...
SM_115 56 10	5600	10.5	SPD16N..	TPD-M15..	C3S150V4..	638B-15-6-F...
SM_142 20 15	2000	6.4	SPD8N.. / TWIN8N	TPD-M08..	C3S075V4..	638B-08-6-F...
SM_142 30 15	3000	9.7	SPD16N..	TPD-M10..	C3S150V4..	638B-10-6-F...
SM_142 45 15	4500	14.4	SPD16N..	TPD-M15..	C3S150V4..	638B-15-6-F...
SM_142 56 15	5600	16	SPD16N..	TPD-M30..	C3S300V4..	n.a.

Order Code

Serie SMB / SME

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
Order example	SMB	A	60	30	1,4	5	9		2I		64	A6		M		2

1 Type Of Motor (mandatory field)

SME	Standard Motor with Encoder SME Series
SMB	Standard Motor with Resolver SMB Series

2 Brake Option

empty field	No Brake Option
A	Motor with Holding Brake (brakes when the supply voltage is 0)

3 Motor Frame Size (mandatory field)

42	Torque 0.35 Nm
60	Torque range 0.55...1.4 Nm
82	Torque 3 Nm
100	Torque range 6 Nm
115	Torque range 10 Nm
142	Torque range 15...17 Nm
170	Torque range 36...60 Nm (Provisional data)

4 Winding (mandatory field)

nn	min ⁻¹ (x100) see "Technical Data" (page 106)
-----------	---

5 Motor Torque (mandatory field)

nn	Torque [Nm] see "Technical Data" (page 106)
-----------	--

6 Flange (mandatory field)

5	B5 Flange
7	Only for Frame 82 and 115
8	Only for Frame 60, 82, 100 and 115
9	Only for Frame 115
A B C	Special Flange

7 Shaft (mandatory field)

9	9x25 mm for size 42 - 9x20 mm for size 60
11	11x23 mm for size 60
14	14x30 mm for size 82
19	19x40 mm for size 82/100/115/142
24	24x50 mm for size 100/115/142
28	28x60 mm for size 115/142
A*	Special shaft under request

8 Key Shaft option

empty field	Shaft with Key
S	Shaft without key

9 Layout - Connectors (mandatory field)

0V	Cable exit and Molex Flying connectors - 200 mm above
2I	Rotatable Interconnectron receptacles
2IB	90° Interconnectron receptacles - forward facing
2ID	90° Interconnectron receptacles - rear facing
DC	Special Customer Layout

10 Female connectors option

empty field	With Female / flying connectors
W	Without Female / flying connectors

11 Protection Degree (mandatory field)

64	IP64
65	IP65

12 Feedback

empty field	Standard Resolver [SMB]
Exx	Prearrangement for external encoder mounting Where xx is the model of feedback [SMB]
A1	Encoder 1024 ppr + Hall - TAMAGAWA OIH48
A2	Encoder 2048 ppr + Hall - TAMAGAWA OIH48
A3	Encoder 4096 ppr + Hall - TAMAGAWA OIH48
A6	SinCos Hiperface Encoder Single-Turn - STEGMANN SRS50/52
A7	SinCos Hiperface Encoder Multi-Turn - STEGMANN SRS50/52
B3	Encoder 2048 ppr + Hall - TAMAGAWA OIH35
B9	SinCos EnDat Encoder Multi-Turn - HEIDENHAIN EQI1331
C1	SinCos EnDat Encoder Single-Turn - HEIDENHAIN EQI1113
C4	Encoder 5000 ppr + Hall - TAMAGAWA OIH48
C6	SinCos Hiperface Encoder Single-Turn - STEGMANN SKS36
C7	SinCos Hiperface Encoder Multi-Turn - STEGMANN SKM36
D3	Encoder 5000ppr + Hall - TAMAGAWA OIH35
D5	SinCos EnDat Encoder Multi-Turn - HEIDENHAIN EQN1325
F2	SinCos EnDat Encoder Multi-Turn - HEIDENHAIN EQN1125
F4	SinCos EnDat Encoder Multi-Turn - HEIDENHAIN EQI1130
G4	SinCos Hiperface Encoder Multi-Turn - STEGMANN SEL37
G5	SinCos Hiperface Encoder Multi-Turn - STEGMANN SEL52
S1	SinCos Hiperface Encoder Single-Turn - STEGMANN SRS50S
S2	SinCos Hiperface Encoder Multi-Turn - STEGMANN SRS50S
S3	SinCos Hiperface Encoder Single-Turn - STEGMANN SKS36S
S4	SinCos Hiperface Encoder Multi-Turn - STEGMANN SKM36S
S5	32768 steps/rev Single Turn Hiperface DSL® Encoder Feedback SIL2
S6	32768 steps/rev x 4096 Multi Turn Hiperface DSL® Encoder Feedback SIL2

13 Option Resolver

H	High Accuracy Resolver [SMB]
----------	------------------------------

14 Option Inertia

empty field Standard Inertia

M Medium Inertia

15 Special Option

empty field No Special Option

1Bxx Motor with 2-side output shaft, where xx is the diameter of second shaft

16 Voltage

0A 24 V

0B 34 V

0C 48 V

0D 50 V

0E 60 V

0F 72 V

0G 74 V

0 80 V

0H 96 V

1A 108-110 V

1D 120 V

1B 125 V

1C 150 V

1 180 V

2 220-230 V

2A 222 V

2B 200 V

3 330 V

4 380-400 V

4A 425 V

4C 460 V

4B 490 V

Order Code

Serie SMH

	1	2	3	4	5	6	7	8	9	10	11	12	13
Order example	SMH	A	60	30	1,4	5	9		2I	64	A6	M	2

1	Type Of Motor (mandatory field)
SMH	Standard Motor with Resolver SMH Series
2	Brake Option
empty field	No Brake Option
A	Motor with Holding Brake (brakes when the supply voltage is 0)
3	Motor Frame Size (mandatory field)
42	Torque 0.35 Nm
60	Torque range 0.55...1.4 Nm
82	Torque 3 Nm
100	Torque range 6 Nm
115	Torque range 10 Nm
142	Torque range 15...17 Nm
4	Winding (mandatory field)
nn	min ⁻¹ (x100) see "Technical Data" (page 106)
5	Motor Torque (mandatory field)
nn	Torque [Nm] see "Technical Data" (page 106)
6	Flange (mandatory field)
5	B5 Flange
7	Only for Frame 82 and 115
8	Only for Frame 60, 82, 100 and 115
9	Only for Frame 115
A B C	Special Flange
7	Shaft (mandatory field)
9	9x25 mm for size 42 - 9x20 mm for size 60
11	11x23 mm for size 60
14	14x30 mm for size 82
19	19x40 mm for size 82/100/115/142
24	24x50 mm for size 100/115/142
28	28x60 mm for size 115/142
8	Key Shaft option
empty field	Shaft with Key
S	Shaft without key
9	Layout - Connectors (mandatory field)
0V	Cable exit and Molex Flying connectors - 200 mm above
2I	Rotatable Interconnectron receptacles
2IB	90° Interconnectron receptacles - forward facing
2ID	90° Interconnectron receptacles - rear facing

10	Protection Degree (mandatory field)
64	IP64
65	IP65
11	Feedback
A6	SinCos Hiperface Encoder Single-Turn - STEGMANN SRS50/52
A7	SinCos Hiperface Encoder Multi-Turn - STEGMANN SRM50/52
C6	SinCos Hiperface Encoder Single-Turn - STEGMANN SKS36
C7	SinCos Hiperface Encoder Multi-Turn - STEGMANN SKM36
G4	SinCos Hiperface Encoder Multi-Turn - STEGMANN SEL37
G5	SinCos Hiperface Encoder Multi-Turn - STEGMANN SEL52
S1	SinCos Hiperface Encoder Single-Turn - STEGMANN SRS50S
S2	SinCos Hiperface Encoder Multi-Turn - STEGMANN SRM50S
S3	SinCos Hiperface Encoder Single-Turn - STEGMANN SKS36S
S4	SinCos Hiperface Encoder Multi-Turn - STEGMANN SKM36S
12	Option Inertia
empty field	Standard Inertia
M	Medium Inertia
13	Voltage
2	220-230 V
4	380-400 V

Order Code

Motor Power Cable for SMB Motors

	1	2	3	4	5	6	7
Order example	CAVOMOT	A	1,5x	5	PM	I	40

1 CAVOMOT	CAVOMOT Power cable drive - motor
2 Brake wire	empty field without brake wire A Brake wire
3 Section [mm²]	1,5x 1,5 mm ² 2,5x 2,5 mm ² 4x, 6x, 10x, 4 mm ² , 6 mm ² , 10 mm ² , 25x 25 mm ² (not for "PM" type)
4 Length [m]	1, ... Length in metre
5 Application Type	PF- Standard cable PM- High flex cable
6 Motor Connector	M Military Connector (Mil) [all layout except 08 and 5] 8 Military Connector (Mil) [all layout 8] I Interconnectron Connector [all layout] 3 Terminal Connection Box [all layout except 3M/3MB/3MC/3MA] S Terminal Connection Box [layout 3M/3M/3MC/3MA] SY Terminal Connection for MBX motors [cable no ATEX] SL Terminal connection box [layout 6i only for MB205 motor] F Faston Connector [layout SMB42 0V] A Amphenol Connector [layout SM_40 0P, 1A, 1C, 2DA, ...] T Trilogy Connector PRM Patch Cord Military Connector (Mil) [all layout except 08]
7 Motor Size	40..265 Motor Size M50 Trilogy Motor NX Motors NX2-3-4-6 type NX----AKR70--

Feedback Cable for SMB Motors

	1	2	3	4	5
Order example	CAVORESX	4	PM	I	SLVDN

1 Signal Cable type	CAVORESX Resolver CAVOENCX Incremental encoder CAVOABSX Absolute Encoder EnDat+SinCos CAVOHIPX Absolute Encoder Hiperface+SinCos CAVOSINX SinCos Encoder CAVOHALX SinCos Encoder + Hall sensor
2 Length [m]	1, ... Length in metre
3 Application Type	PM- Moving Application
4 Motor Connector	M Military Connector (Mil) [all layout except 08] 8 Military Connector (Mil) [all layout 08] I Interconnectron Connector [all layout] S Terminal Connection Box layout 3M/3M/3MC/3MA and motor MBX F Faston Connector [layout SMB40 0V] A Amphenol Connector [layout SMB40 0P, 1A, 1C, 2DA, ...] T Trilogy Connector NX Motors NX2-3-4-6-8 type NX----AKR7--- E Free signal cable for EX motors PRM Patch Cord Military Connector (Mil) [all layout except 08]
5 Drive Type	LVD LVD Drive HPD HPD Drive SLVD SLVD e SLVD-N Drive SLVDN SLVD-N Drive TPD TPD-M SPD/TWIN TWIN_N e SPD_N Drive or wire without connector drive side HIDRIVE Hi-Drive 631 Servodrives 631 638 Servodrives 638 637F Servodrives 637F

Order Code

Motor Power Cable for SMH Motors

	1	2
Order example:	MOK	55/02

1	Cable	
	MOK	Motor cable ⁽²⁾
2	Type	
		for SMH / MH56 / MH70 / MH105 ⁽³⁾
	55/....⁽¹⁾	1,5 mm ² ; up to 13,8 A
	54/....⁽¹⁾	1,5 mm ² ; up to 13,8 A Moving application
	56/....⁽¹⁾	2,5 mm ² ; up to 18,9 A
	57/....⁽¹⁾	2,5 mm ² ; up to 18,9 A Moving application
		for MH145 / MH205 ⁽⁴⁾
	60/....⁽¹⁾	1,5 mm ² ; up to 13,8 A
	63/....⁽¹⁾	1,5 mm ² ; up to 13,8 A Moving application
	59/....⁽¹⁾	2,5 mm ² ; up to 18,9 A
	64/....⁽¹⁾	2,5 mm ² ; up to 18,9 A Moving application
	61/....⁽¹⁾	6 mm ² ; up to 32,3 A Moving application
	62/....⁽¹⁾	10 mm ² ; up to 47,3 A Moving application

MOK55 and MOK54 are also possible for linear motors LXR406, LXR412 and BLMA.

Length code for cables

⁽¹⁾ Length code 1 (Example: SSK01/09 = length 25 m)

Length [m]	1,0	2,5	5,0	7,5	10,0	12,5	15,0	20,0	25,0	30,0	35,0	40,0	45,0	50,0
Order code	01	02	03	04	05	06	07	08	09	10	11	12	13	14

⁽²⁾ Color according to DESINA

⁽³⁾ with motor connector

⁽⁴⁾ with cable eye for motor terminal box

Feedback Cable for SMH Motors

	1
Order example:	REK42/02

1	Zubehör	
		for MH/SMH-Motors
	REK42/....⁽¹⁾	Resolver cable ⁽²⁾
	REK41/....⁽¹⁾	Resolver cable ⁽²⁾ Moving application
	GBK24/....⁽¹⁾	SinCos© Feedback cable ⁽²⁾ Moving application
	GBK38/....⁽¹⁾	EnDat 2.1 Feedback cable ⁽²⁾ Moving application
	GBK23/....⁽¹⁾	Encoder cable ⁽²⁾
		for linear motors
	GBK33/....⁽¹⁾	Feedback cable for LXR Moving application
	GBK32/....⁽¹⁾	Feedback cable for BLMA Moving application

Servo Motor - MB / MH

Overview

Description

The MB / MH ⁽¹⁾ series caters for torques in the range of 0.2 to 285 Nm, speeds up to 10 000 min⁻¹ and includes a total of 75 models available across 6 frame sizes. Thanks to the high quality and performance of the Neodymium-Iron-Boron magnets, and also the encapsulation method used to fasten them to the shaft, the MB / MH series of motors can achieve very high accelerations and withstand high overload without the risk of demagnetisation or detachment of the magnets. Furthermore, shaft and flange size flexibility on all models provides the user with the possibility to optimise their motor selection for any given application. Adequate mechanical over-sizing, low inertia in an extra-strong mechanism and a broad range of models permits the application of the MB / MH series in all fields where high dynamic performance and utmost reliability are crucial features.

Typical applications include any type of automatic machinery, especially in the product packaging and handling industry, and wherever the demand exists for axis speed and position synchronisation.

Features

- Large set of feedback option
- Customization
- Increase inertia option
- ATEX certification for MB/MH105/145
- Options
 - Flying cables
 - Terminal box (power and resolver)
 - External encoder
 - Increased inertia
 - Brake
 - Feedback - resolver/incremental/ SinCos/absolute encoder
 - Thermal protection (PTC for MB and KTY for MH)
 - Second shaft

Application

- Food, Pharma & Beverage
- Packaging Machines
- Material Forming
- Material Handling
- Factory Automation
- Life Science Diagnostic
- Automotive Industry / In-Plant
- Printing Industry
- Textile Machines
- Robotics
- Servo Hydraulic Pumps



Technical Characteristics - Overview

Motor Type	Permanent magnets synchronous servo motor
Rotor Design	Rotor with surface rare earth magnets
Power supply	230 VAC or 400 VAC
Operating temperature	-10/+40 °C
Number of poles	4 for M_ 56-70 8 for M_ 105-145-205-265
Power Range	0.05...67 kW
Torque Range	0.2...285 Nm
Speed Range	0...10 000 min ⁻¹
Mounting	Flange with smooth holes B14, B3 option
Shaft End	Plain keyed shaft Plain smooth shaft (option)
Cooling	Natural ventilation Self-ventilation (option for size 105-145-205) Forced ventilation (option for size 105-145-205) Water cooled (option for size 145)
Protection Level (IEC60034-5)	IP64 IP65 (option)
Feedback sensor	Resolver Absolute EnDat or Hiperface Incremental Encoder
Voltage Supply	230 / 400 VAC
Temperature Class	Class F
Connections	Connectors Flying cables Terminal Box (see table option for combination)
Marking	CE
Standards In compliance with:	73/23/CEE and 93/68/CEE EN60034-1 EN60034-5 EN60034-5/A1 EN60034-9 EN60034-14

⁽¹⁾ MB for drives: TPD-M, SLVD-N, TWIN-N, SPD-N, Hi-Drive, MH for drive: Compax3

Technical Characteristics

MB / MH Motors, Size 56 - 0.2...0.6 Nm

230 VAC

Model	Size	Stall		Nominal			Peak Torque ⁽¹⁾	Inertia		Ke ⁽²⁾⁽³⁾	Kt ⁽²⁾⁽³⁾
		Torque ⁽¹⁾	Current	Torque ⁽¹⁾	Speed	Current		No brake	With brake		
		T ₀₆₅ (T ₁₀₅) [Nm]	I ₀₆₅ [A]	T _{n065} [Nm]	n [min ⁻¹]	I _{n065} [A]	T _{max} [Nm]	J [kgmm ²]	J [kgmm ²]	Ke [Vs]	Kt [Nm/A _{rms}]
M_56 25 0,2	56	0.2 (0.40)	0.27	0.21	2500	0.26	1.3	11	28	0.48	0.83
M_56 50 0,2			0.46	0.19	5000	0.42				0.28	0.48
M_56 100 0,2			0.84	0.15	10000	0.60				0.15	0.26
M_56 25 0,4		0.4 (0.80)	0.49	0.40	2500	0.46	2.5	16	33	0.52	0.91
M_56 50 0,4			0.84	0.35	5000	0.71				0.30	0.53
M_56 100 0,4			1.52	0.21	10000	0.81				0.17	0.29
M_56 25 0,6		0.6 (1.14)	0.67	0.60	2500	0.63	3.6	21	38	0.57	0.99
M_56 50 0,6			1.21	0.51	5000	0.98				0.32	0.55
M_56 100 0,6			2.18	0.18	10000	0.71				0.18	0.31

400 VAC

Model	Size	Stall		Nominal			Peak Torque ⁽¹⁾	Inertia		Ke ⁽²⁾⁽³⁾	Kt ⁽²⁾⁽³⁾
		Torque ⁽¹⁾	Current	Torque ⁽¹⁾	Speed	Current		No brake	With brake		
		T ₀₆₅ (T ₁₀₅) [Nm]	I ₀₆₅ [A]	T _{n065} [Nm]	n [min ⁻¹]	I _{n065} [A]	T _{max} [Nm]	J [kgmm ²]	J [kgmm ²]	Ke [Vs]	Kt [Nm/A _{rms}]
M_56 50 0,2	56	0.2 (0.40)	0.27	0.19	5000	0.24	1.3	11	28	0.48	0.83
M_56 95 0,2			0.46	0.16	9500	0.36				0.28	0.48
M_56 50 0,4		0.4 (0.80)	0.49	0.34	5000	0.40	2.5	16	33	0.52	0.91
M_56 95 0,4			0.84	0.23	9500	0.48				0.30	0.53
M_56 50 0,6		0.6 (1.14)	0.67	0.50	5000	0.54	3.6	21	38	0.57	0.99
M_56 95 0,6			1.21	0.25	9500	0.51				0.32	0.55

⁽¹⁾ Data referred to motor suspend in horizontal position in free still air, 20 °C ambient temperature

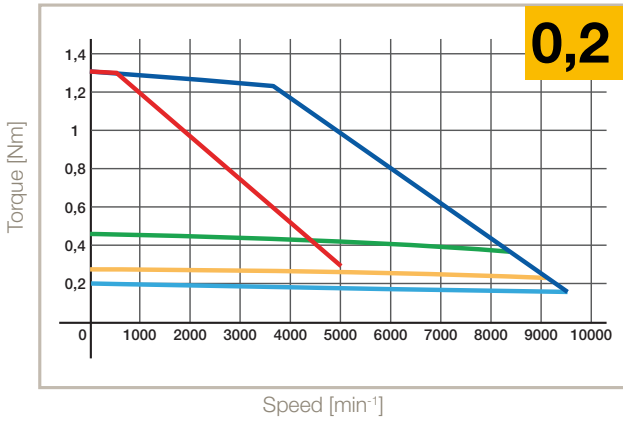
⁽²⁾ Data measured at 20 °C. When "hot" consider 5 % derating

⁽³⁾ Tolerance data ±10 %

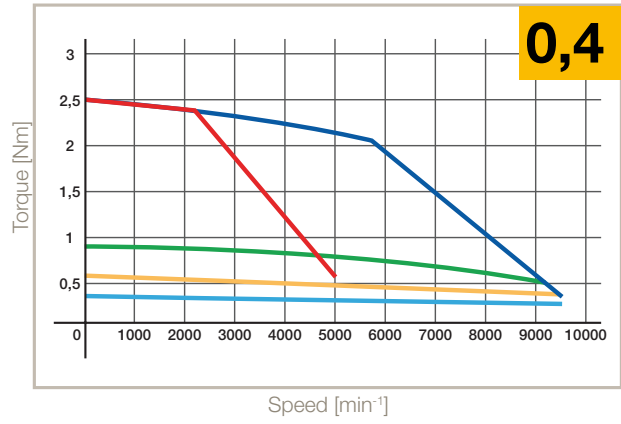
Speed Torque Curves

MB/MH56

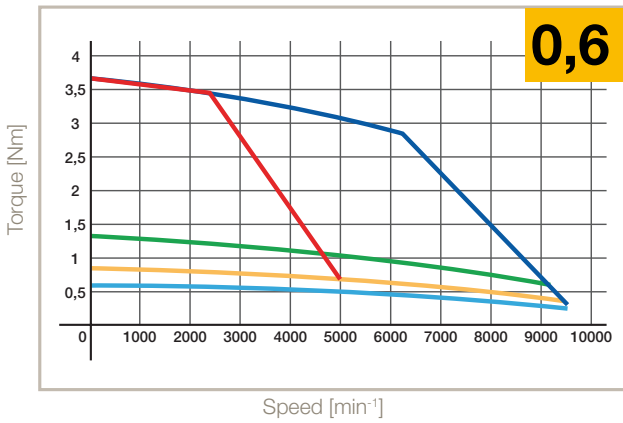
5000 min⁻¹ 230 V - 9500 min⁻¹ 400 V



5000 min⁻¹ 230 V - 9500 min⁻¹ 400 V



5000 min⁻¹ 230 V - 9500 min⁻¹ 400 V



- S1 65 K, ΔT
- S3 10 %, 5 min, 400 V
- S3 10 %, 5 min, 230 V
- S3 50 %, 5 min
- S3 20 %, 5 min

Motors
 MB / MH Series

MB / MH Motors, Size 70 - 0.5...2.5 Nm

230 VAC

Model	Size	Stall		Nominal			Peak Torque ⁽¹⁾	Inertia		Ke ⁽²⁾⁽³⁾	Kt ⁽²⁾⁽³⁾
		Torque ⁽¹⁾	Current	Torque ⁽¹⁾	Speed	Current		No brake	With brake		
		T ₀₆₅ (T ₁₀₅) [Nm]	I ₀₆₅ [A]	T _{n065} [Nm]	n [min ⁻¹]	I _{n065} [A]	T _{max} [Nm]	J [kgmm ²]	J [kgmm ²]	Ke [Vs]	Kt [Nm/A _{rms}]
M_70 20 0,5	70	0.5 (0.9)	0.44	0.5	2000	0.43	2.8	26	55	0.67	1.17
M_70 38 0,5			0.72	0.4	3800	0.66				0.41	0.71
M_70 75 0,5			1.37	0.4	7500	1.00				0.22	0.38
M_70 20 01		1.0 (1.6)	0.84	1.0	2000	0.80	5.1	40	69	0.72	1.25
M_70 38 01			1.39	0.8	3800	1.23				0.42	0.72
M_70 75 01			2.65	0.5	7500	1.43				0.23	0.39
M_70 20 1,5		1.5 (2.2)	1.23	1.5	2000	1.18	6.8	54	83	0.73	1.27
M_70 38 1,5			2.25	1.4	3800	1.96				0.42	0.72
M_70 75 1,5			4.07	0.7	7500	1.85				0.23	0.39
M_70 20 02		2.0 (2.7)	1.55	1.9	2000	1.47	8.4	68	97	0.78	1.36
M_70 38 02			2.82	1.7	3800	2.40				0.43	0.75
M_70 75 02			5.36	0.6	7500	1.74				0.23	0.39
M_70 20 2,5		2.5 (3.1)	1.90	2.4	2000	1.82	9.8	81	11	0.79	1.36
M_70 38 2,5			3.56	2.1	3800	3.01				0.42	0.73
M_70 75 2,5			6.77	0.6	7500	1.77				0.22	0.38

400 VAC

Model	Size	Stall		Nominal			Peak Torque ⁽¹⁾	Inertia		Ke ⁽²⁾⁽³⁾	Kt ⁽²⁾⁽³⁾
		Torque ⁽¹⁾	Current	Torque ⁽¹⁾	Speed	Current		No brake	With brake		
		T ₀₆₅ (T ₁₀₅) [Nm]	I ₀₆₅ [A]	T _{n065} [Nm]	n [min ⁻¹]	I _{n065} [A]	T _{max} [Nm]	J [kgmm ²]	J [kgmm ²]	Ke [Vs]	Kt [Nm/A _{rms}]
M_70 37 0,5	70	0.5 (0.9)	0.44	0.5	3700	0.41	2.8	26	55	0.67	1.17
M_70 70 0,5			0.72	0.4	7000	0.55				0.41	0.71
M_70 37 01		1.0 (1.6)	0.84	0.9	3700	0.74	5.1	40	69	0.72	1.25
M_70 70 01			1.39	0.6	7000	0.85				0.42	0.72
M_70 37 1,5		1.5 (2.2)	1.23	1.3	3700	1.07	6.8	54	83	0.73	1.27
M_70 70 1,5			2.25	0.8	7000	1.27				0.42	0.72
M_70 37 2,0		2.0 (2.7)	1.55	1.7	3700	1.32	8.4	68	97	0.78	1.36
M_70 70 2,0			2.82	0.9	7000	1.35				0.43	0.75
M_70 37 2,5		2.5 (3.1)	1.90	2.1	3700	1.60	9.8	81	110	0.79	1.36
M_70 70 2,5			3.56	1.2	7000	1.73				0.42	0.73

⁽¹⁾ Data referred to motor suspend in horizontal position in free still air, 20 °C ambient temperature

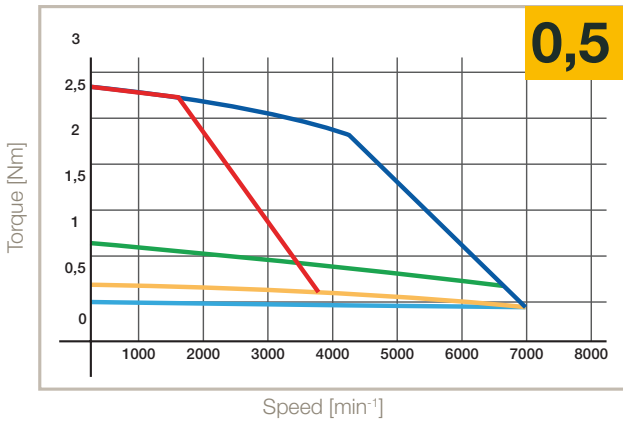
⁽²⁾ Data measured at 20 °C. When "hot" consider 5 % derating

⁽³⁾ Tolerance data ±10 %

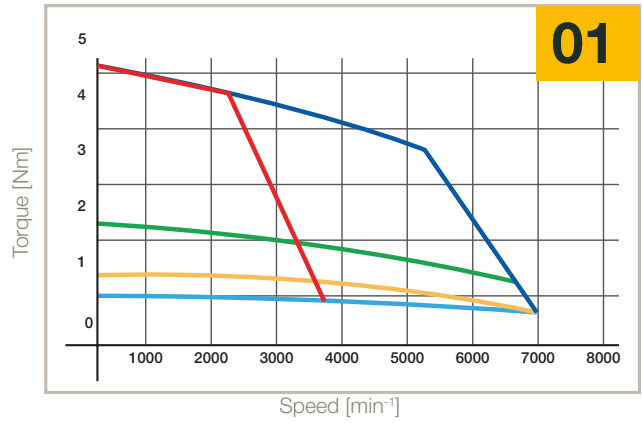
Speed Torque Curves

MB/MH70

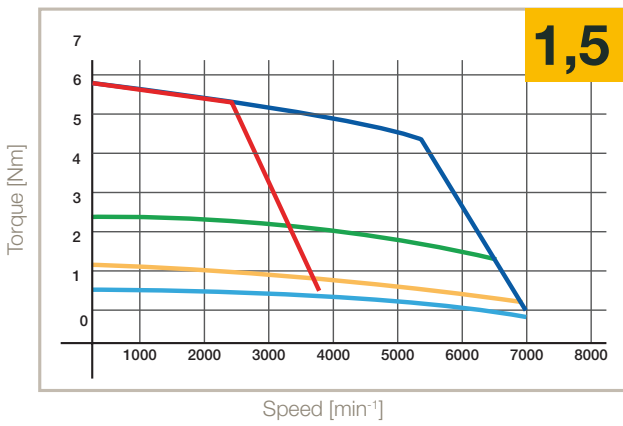
3800 min⁻¹ 230 V - 7000 min⁻¹ 400 V



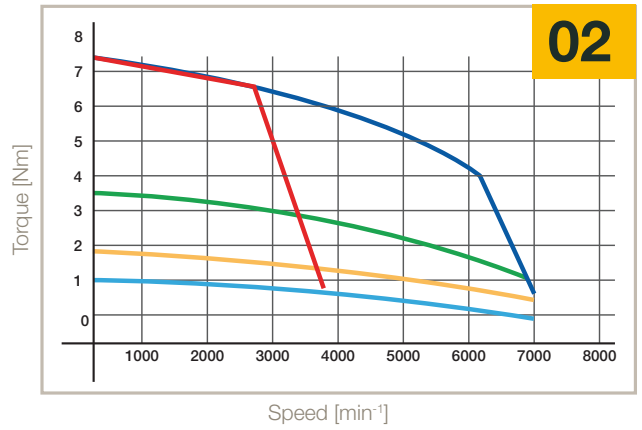
3800 min⁻¹ 230 V - 7000 min⁻¹ 400 V



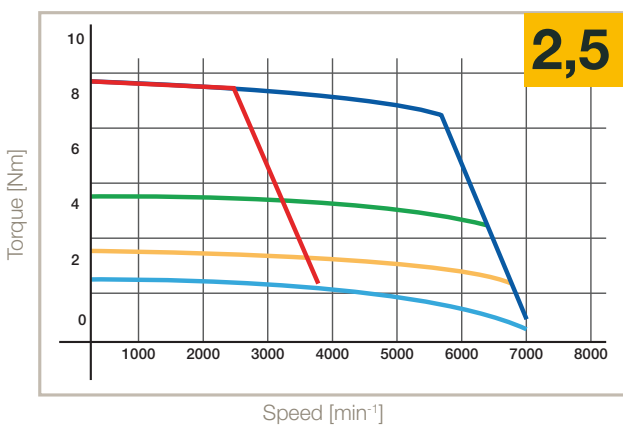
3800 min⁻¹ 230 V - 7000 min⁻¹ 400 V



3800 min⁻¹ 230 V - 7000 min⁻¹ 400 V



3800 min⁻¹ 230 V - 7000 min⁻¹ 400 V



- S1 65 K, ΔT
- S3 10 %, 5 min, 400 V
- S3 10 %, 5 min, 230 V
- S3 50 %, 5 min
- S3 20 %, 5 min

MB / MH Motors, Size 105 - 2.2...8 Nm

230 VAC

Model	Size	Stall		Nominal			Peak Torque ⁽¹⁾	Inertia		Ke ⁽²⁾⁽³⁾	Kt ⁽²⁾⁽³⁾
		Torque ⁽¹⁾	Current	Torque ⁽¹⁾	Speed	Current		No brake	With brake		
		T ₀₆₅ (T ₁₀₅) [Nm]	I ₀₆₅ [A]	T _{n065} [Nm]	n [min ⁻¹]	I _{n065} [A]	T _{max} [Nm]	J [kgmm ²]	J [kgmm ²]	Ke [Vs]	Kt [Nm/A _{rms}]
M_105 16 02	105	2.2 (3.5)	1.5	2.2	1600	1.4	11.0	190	253	0.9	1.63
M_105 25 02			2.1	2.1	2500	2.0				0.6	1.11
M_105 30 02			2.8	2.1	3000	2.6				0.5	0.83
M_105 50 02			4.3	1.8	5000	3.5				0.3	0.55
M_105 16 04		4.0 (6.1)	2.6	4.0	1600	2.5	19.5	340	403	1.0	1.65
M_105 25 04			3.8	3.7	2500	3.5				0.7	1.13
M_105 30 04			5.0	3.6	3000	4.4				0.5	0.85
M_105 50 04			7.4	2.7	5000	5.0				0.3	0.58
M_105 16 06		6.0 (8.3)	3.9	5.9	1600	3.7	26.2	480	543	1.0	1.65
M_105 25 06			5.6	5.5	2500	5.0				0.7	1.15
M_105 30 06			7.4	5.2	3000	6.4				0.5	0.87
M_105 50 06			11.2	3.6	5000	6.7				0.3	0.58
M_105 16 08		8.0 (10.0)	5.2	7.8	1600	5.0	31.7	620	683	1.0	1.65
M_105 25 08			7.5	7.2	2500	6.6				0.7	1.15
M_105 30 08			9.7	6.8	3000	8.2				0.5	0.88
M_105 50 08			14.2	4.4	5000	7.9				0.4	0.61

400 VAC

Model	Size	Stall		Nominal			Peak Torque ⁽¹⁾	Inertia		Ke ⁽²⁾⁽³⁾	Kt ⁽²⁾⁽³⁾
		Torque ⁽¹⁾	Current	Torque ⁽¹⁾	Speed	Current		No brake	With brake		
		T ₀₆₅ (T ₁₀₅) [Nm]	I ₀₆₅ [A]	T _{n065} [Nm]	n [min ⁻¹]	I _{n065} [A]	T _{max} [Nm]	J [kgmm ²]	J [kgmm ²]	Ke [Vs]	Kt [Nm/A _{rms}]
M_105 30 02	105	2.2 (3.5)	1.5	2.1	3000	1.4	11.0	190	253	0.9	1.63
M_105 45 02			2.1	1.9	4500	1.8				0.6	1.11
M_105 60 02			2.8	1.7	6000	2.2				0.5	0.83
M_105 30 04		4.0 (6.1)	2.6	3.6	3000	2.3	19.5	340	403	1.0	1.65
M_105 45 04			3.8	3.0	4500	2.8				0.7	1.13
M_105 60 04			5.0	2.4	6000	3.0				0.5	0.85
M_105 30 06		6.0 (8.3)	3.9	5.3	3000	3.4	26.2	480	543	1.0	1.65
M_105 45 06			5.6	4.1	4500	3.8				0.7	1.15
M_105 60 06			7.4	3.0	6000	3.7				0.5	0.87
M_105 30 08		8.0 (10.0)	5.2	6.9	3000	4.4	31.7	620	683	1.0	1.65
M_105 45 08			7.5	5.2	4500	4.9				0.7	1.15
M_105 60 08			9.7	3.6	6000	4.4				0.5	0.88

⁽¹⁾ Data referred to motor suspend in horizontal position in free still air, 20 °C ambient temperature

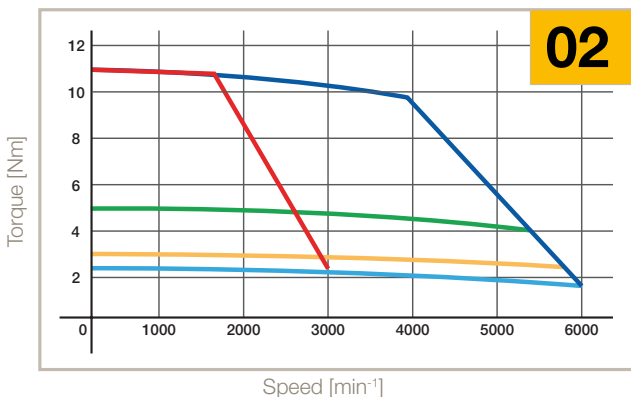
⁽²⁾ Data measured at 20 °C. When "hot" consider 5 % derating

⁽³⁾ Tolerance data ±10 %

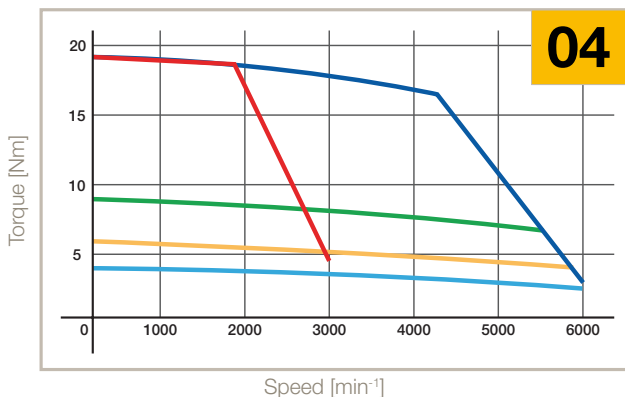
Speed Torque Curves

MB/MH105

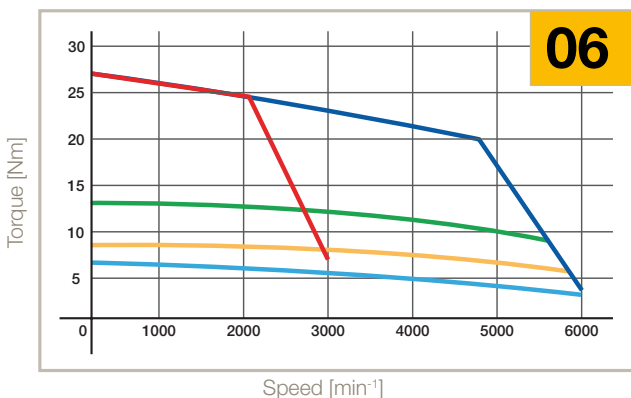
3000 min⁻¹ 230 V - 6000 min⁻¹ 400 V



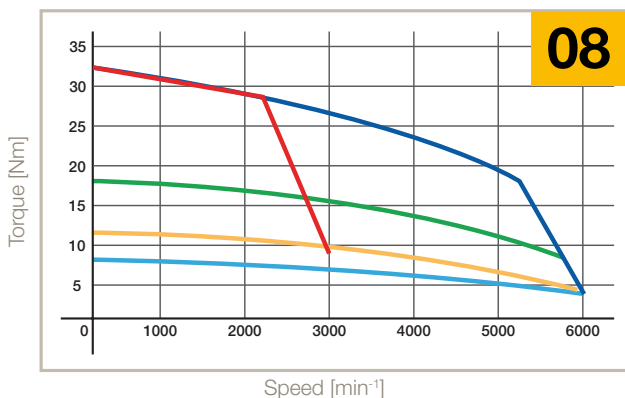
3000 min⁻¹ 230 V - 6000 min⁻¹ 400 V



3000 min⁻¹ 230 V - 6000 min⁻¹ 400 V



3000 min⁻¹ 230 V - 6000 min⁻¹ 400 V



- S1 65 K, ΔT
- S3 10 %, 5 min, 400 V
- S3 10 %, 5 min, 230 V
- S3 50 %, 5 min
- S3 20 %, 5 min

Motors
 MB / MH Series

MB / MH Motors, Size 145 - 4.5...28 Nm

230 VAC

Model	Size	Stall		Nominal			Peak Torque ⁽¹⁾	Inertia		Ke ⁽²⁾⁽³⁾	Kt ⁽²⁾⁽³⁾
		Torque ⁽¹⁾	Current	Torque ⁽¹⁾	Speed	Current		No brake	With brake		
		T ₀₆₅ (T ₁₀₅) [Nm]	I ₀₆₅ [A]	T _{n065} [Nm]	n [min ⁻¹]	I _{n065} [A]	T _{max} [Nm]	J [kgmm ²]	J [kgmm ²]	Ke [Vs]	Kt [Nm/A _{rms}]
M_145 5,5 04	145	4.5 (9)	1.1	4.6	550	1.1	28	780	975	2.1	3.65
M_145 11 04			2.3	4.6	1100	2.4				1.2	2.03
M_145 16 04			3.4	4.5	1600	3.3				0.8	1.42
M_145 25 04			4.7	4.3	2500	4.5				0.6	1.01
M_145 40 04			8.1	4.1	4000	7.2				0.4	0.60
M_145 5,5 08		8.7 (16)	2.0	8.7	550	2.0	49	1050	1245	2.7	4.69
M_145 11 08			3.7	8.7	1100	3.6				1.4	2.49
M_145 16 08			5.4	8.6	1600	5.2				1.0	1.70
M_145 25 08			8.2	8.1	2500	7.4				0.7	1.14
M_145 40 08			12.3	7.0	4000	9.7				0.4	0.76
M_145 5,5 15		15.0 (27)	3.3	15.0	550	3.2	86	1600	1795	2.9	4.94
M_145 11 15			6.2	14.7	1100	5.9				1.5	2.59
M_145 16 15			9.1	14.3	1600	8.5				1.0	1.78
M_145 25 15			14.2	13.6	2500	12.5				0.7	1.14
M_145 40 15			21.3	10.9	4000	15.0				0.4	0.76
M_145 5,5 22		22.0 (37)	4.7	21.9	550	4.6	117	2150	2345	2.9	5.03
M_145 11 22			8.9	21.3	1100	8.4				1.5	2.65
M_145 16 22			13.1	20.8	1600	12.1				1.0	1.80
M_145 25 22			20.8	19.1	2500	17.6				0.7	1.13
M_145 40 22			31.1	13.4	4000	18.6				0.4	0.76
M_145 5,5 28		28.0 (45)	5.9	27.8	550	5.8	143	2700	2895	2.9	5.07
M_145 11 28			11.3	26.9	1100	10.6				1.5	2.65
M_145 16 28			17.0	26.2	1600	15.5				1.0	1.78
M_145 25 28			26.5	23.2	2500	21.4				0.7	1.13
M_145 40 28			39.6	14.1	4000	19.7				0.4	0.76

400 VAC

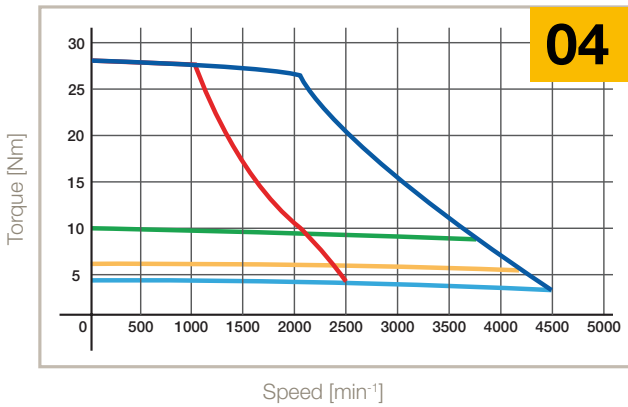
Model	Size	Stall		Nominal			Peak Torque ⁽¹⁾	Inertia		Ke ⁽²⁾⁽³⁾	Kt ⁽²⁾⁽³⁾
		Torque ⁽¹⁾	Current	Torque ⁽¹⁾	Speed	Current		No brake	With brake		
		T ₀₆₅ (T ₁₀₅) [Nm]	I ₀₆₅ [A]	T _{n065} [Nm]	n [min ⁻¹]	I _{n065} [A]	T _{max} [Nm]	J [kgmm ²]	J [kgmm ²]	Ke [Vs]	Kt [Nm/A _{rms}]
M_145 10 04	145	4.5 (9)	1.1	4.5	1000	1.1	28	780	975	2.1	3.65
M_145 20 04			2.3	4.5	2000	2.3				1.2	2.03
M_145 30 04			3.4	4.3	3000	3.2				0.8	1.42
M_145 45 04			4.7	3.9	4500	4.0				0.6	1.01
M_145 10 08			8.7 (16)	2.0	8.7	1000				1.9	49
M_145 20 08		3.7		8.4	2000	3.5	1.4	2.49			
M_145 30 08		5.4		7.9	3000	4.8	1.0	1.70			
M_145 45 08		8.2		7.1	4500	6.6	0.7	1.14			
M_145 10 15		15.0 (27)		3.3	14.8	1000	3.1	86	1600	1795	
M_145 20 15			6.2	13.7	2000	5.5	1.5				2.59
M_145 30 15			9.1	12.7	3000	7.5	1.0				1.78
M_145 45 15			14.2	9.8	4500	9.1	0.7				1.14
M_145 10 22			22.0 (37)	4.7	21.4	1000	4.5				117
M_145 20 22		8.9		19.4	2000	7.6	1.5	2.65			
M_145 30 22		13.1		17.3	3000	10.1	1.0	1.80			
M_145 45 22		20.8		11.6	4500	10.8	0.7	1.13			
M_145 10 28		28.0 (45)		5.9	27.1	1000	5.6	143	2700	2895	
M_145 20 28			11.3	23.9	2000	9.4	1.5				2.65
M_145 30 28			17.0	21.1	3000	12.5	1.0				1.78
M_145 45 28			26.5	10.0	4500	9.4	0.7				1.13

Motors
MB / MH Series

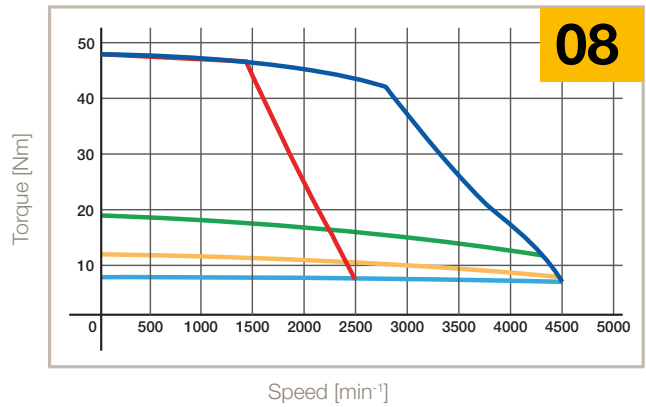
Speed Torque Curves

MB/MH145

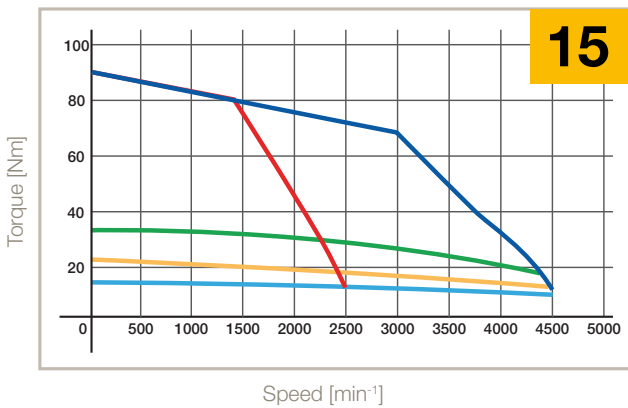
2500 min⁻¹ 230 V - 4500 min⁻¹ 400 V



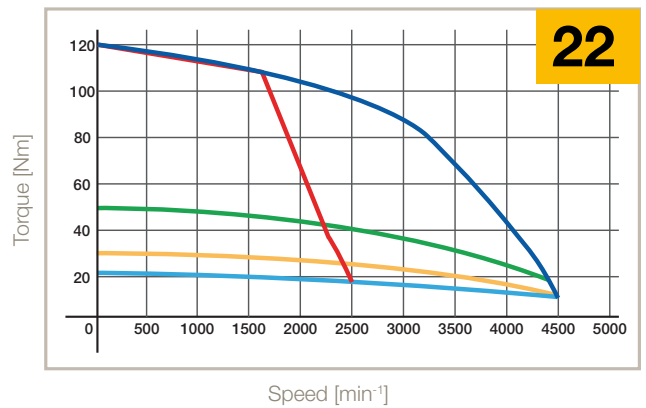
2500 min⁻¹ 230 V - 4500 min⁻¹ 400 V



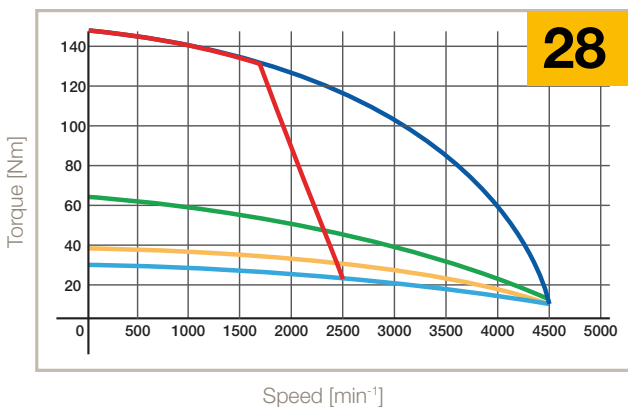
2500 min⁻¹ 230 V - 4500 min⁻¹ 400 V



2500 min⁻¹ 230 V - 4500 min⁻¹ 400 V



2500 min⁻¹ 230 V - 4500 min⁻¹ 400 V



- S1 65 K, ΔT
- S3 10 %, 5 min, 400 V
- S3 10 %, 5 min, 230 V
- S3 50 %, 5 min
- S3 20 %, 5 min

⁽¹⁾ Data referred to motor suspend in horizontal position in free still air, 20 °C ambient temperature
⁽²⁾ Data measured at 20 °C. When "hot" consider 5 % derating
⁽³⁾ Tolerance data ±10 %

MB / MH Motors, Size 205 - 15...90 Nm

230 VAC

Model	Size	Stall		Nominal			Peak Torque ⁽¹⁾	Inertia		Ke ⁽²⁾⁽³⁾	Kt ⁽²⁾⁽³⁾
		Torque ⁽¹⁾	Current	Torque ⁽¹⁾	Speed	Current		No brake	With brake		
		T ₀₆₅ (T ₁₀₅) [Nm]	I ₀₆₅ [A]	T _{n065} [Nm]	n [min ⁻¹]	I _{n065} [A]	T _{max} [Nm]	J [kgmm ²]	J [kgmm ²]	Ke [Vs]	Kt [Nm/A _{rms}]
M_205 11 15	205	15 (22)	6.3	14.7	1150	6.2	69	3500	4035	1.4	2.38
M_205 17 15			8.6	14.4	1700	8.3				1	1.74
M_205 5,5 28		28 (39)	6.9	28.6	550	6.9	123	5000	5535	2.5	4.35
M_205 11 28			13.0	28.2	1150	12.7				1.3	2.31
M_205 17 28			20.1	27.6	1700	19.3				0.9	1.50
M_205 5,5 50		50 (70)	12.4	51.3	550	12.3	222	8000	8535	2.5	4.35
M_205 11 50			22.1	50.0	1150	21.3				1.4	2.45
M_205 17 50			33.1	48.0	1700	30.8				0.9	1.63
M_205 5,5 70		70 (98)	16.8	71.1	550	16.5	310	11 000	11 535	2.6	4.49
M_205 11 70			30.7	68.6	1150	29.3				1.4	2.45
M_205 17 70			46.1	65.0	1700	41.7				0.9	1.63
M_205 5,5 90		90 (126)	22.1	90.9	550	21.8	398	14 000	14 535	2.5	4.35
M_205 11 90			44.3	87.0	1150	41.8				1.3	2.18
M_205 17 90			59	81.7	1700	52.4				0.9	1.63

400 VAC

Model	Size	Stall		Nominal			Peak Torque ⁽¹⁾	Inertia		Ke ⁽²⁾⁽³⁾	Kt ⁽²⁾⁽³⁾
		Torque ⁽¹⁾	Current	Torque ⁽¹⁾	Speed	Current		No brake	With brake		
		T ₀₆₅ (T ₁₀₅) [Nm]	I ₀₆₅ [A]	T _{n065} [Nm]	n [min ⁻¹]	I _{n065} [A]	T _{max} [Nm]	J [kgmm ²]	J [kgmm ²]	Ke [Vs]	Kt [Nm/A _{rms}]
M_205 20 15	205	15 (22)	6.3	14.1	2000	5.9	69	3500	4035	1.4	2.38
M_205 30 15			8.6	13.4	3000	7.7				1	1.74
M_205 10 28		28 (39)	6.9	28.2	1000	6.8	123	5000	5535	2.5	4.35
M_205 20 28			13.0	27.3	2000	12.3				1.3	2.31
M_205 30 28			20.1	25.7	3000	18.0				0.9	1.50
M_205 10 50		50 (70)	12.4	50.4	1000	12.1	222	8000	8535	2.5	4.35
M_205 20 50			22.1	47.0	2000	20.1				1.4	2.45
M_205 30 50			33.1	41.7	3000	26.8				0.9	1.63
M_205 10 70		70 (98)	16.8	69.4	1000	16.1	310	11 000	11 535	2.6	4.49
M_205 20 70			30.7	62.9	2000	26.9				1.4	2.45
M_205 30 70			46.1	52.3	3000	33.7				0.9	1.63
M_205 10 90		90 (126)	22.1	88.2	1000	21.2	398	14 000	14 535	2.5	4.35
M_205 20 90			44.3	78.3	2000	37.7				1.3	2.18
M_205 30 90			59.0	61.6	3000	39.7				0.9	1.63

⁽¹⁾ Data referred to motor suspend in horizontal position in free still air, 20 °C ambient temperature

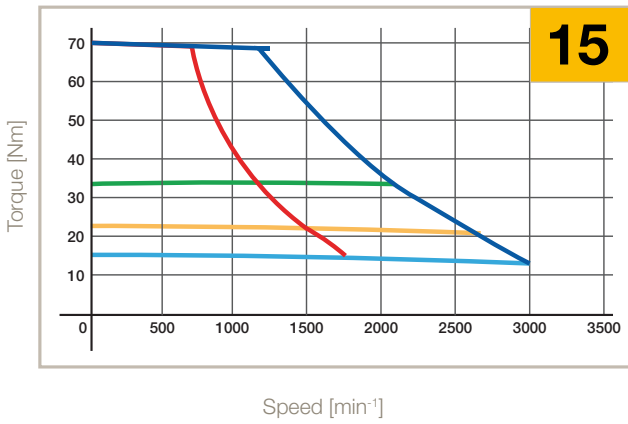
⁽²⁾ Data measured at 20 °C. When "hot" consider 5 % derating

⁽³⁾ Tolerance data ±10 %

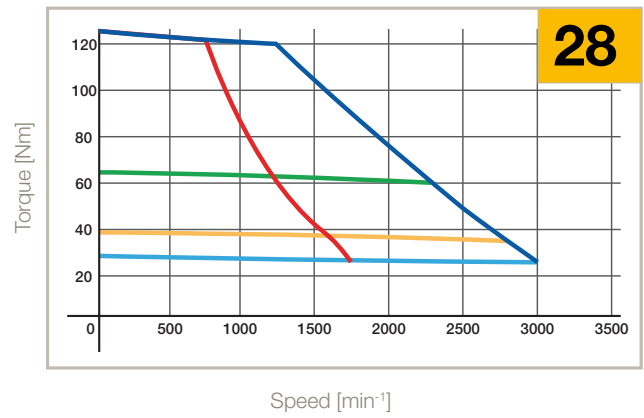
Speed Torque Curves

MB/MH205

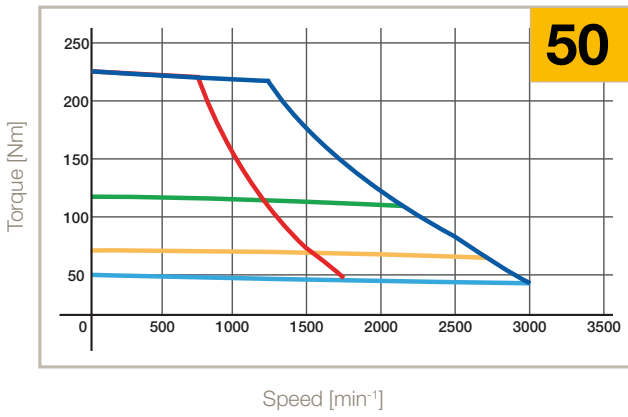
1700 min⁻¹ 230 V - 3000 min⁻¹ 400 V



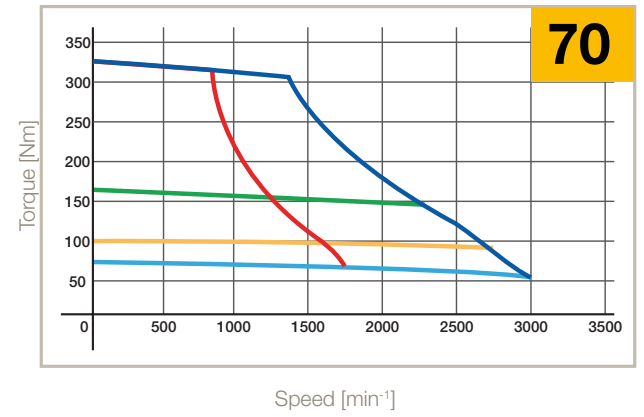
1700 min⁻¹ 230 V - 3000 min⁻¹ 400 V



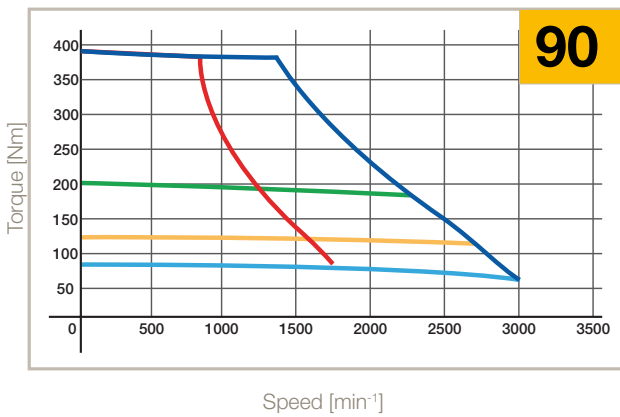
1700 min⁻¹ 230 V - 3000 min⁻¹ 400 V



1700 min⁻¹ 230 V - 3000 min⁻¹ 400 V



1700 min⁻¹ 230 V - 3000 min⁻¹ 400 V



- S1 65 K, ΔT
- S3 10 %, 5 min, 400 V
- S3 10 %, 5 min, 230 V
- S3 50 %, 5 min
- S3 20 %, 5 min

Motors
MB / MH Series

MB / MH Motors, Size 265 - 75...270 Nm

400 VAC

Model	Size	Stall		Nominal			Peak Torque ⁽¹⁾	Inertia		Ke ⁽²⁾⁽³⁾	Kt ⁽²⁾⁽³⁾
		Torque ⁽¹⁾	Current	Torque ⁽¹⁾	Speed	Current		No brake	With brake		
		T ₀₆₅ (T ₁₀₅) [Nm]	I ₁₀₅ [A]	T _{n105} [Nm]	n [min ⁻¹]	I _{n105} [A]	T _{max} [Nm]	J [kgmm ²]	J [kgmm ²]	Ke [Vs]	Kt [Nm/A _{rms}]
M_265 10 75	265	75 (94)	20	94	1000	20.1	235	22 000	30 100	2.86	4.71
M_265 20 75		74 (92)	39	92	2000	39				1.43	2.35
M_265 30 75			59	87	3000	55				0.95	1.57
M_265 10 150		142 (176)	37	176	1000	37	451	36 000	44 100	2.86	4.71
M_265 20 150		144 (179)	86	170	2000	81				1.27	2.09
M_265 30 150		141 (175)	112	144	3000	92				0.95	1.57
M_265 10 220		206 (255)	54	254	1000	54	657	49 000	61 960	2.86	4.71
M_265 20 220		206 (255)	108	231	2000	98				1.43	2.35
M_265 30 220		205 (254)	162	185	3000	118				0.95	1.57
M_265 10 285		267 (332)	64	325	1000	62	857	63 000	75 960	3.18	5.23
M_265 20 285		267 (332)	159	288	2000	138				1.27	2.09
M_265 30 285		269 (334)	213	215	3000	137				0.95	1.57

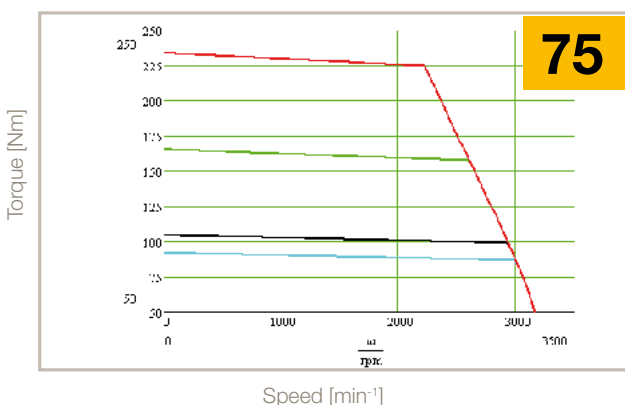
⁽¹⁾ Data referred to motor suspend in horizontal position in free still air, 20 °C ambient temperature

⁽²⁾ Data measured at 20 °C. When "hot" consider 5 % derating

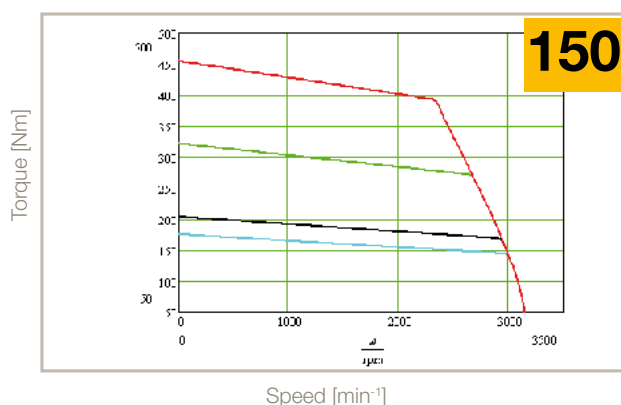
⁽³⁾ Tolerance data ±10 %

Speed Torque Curves

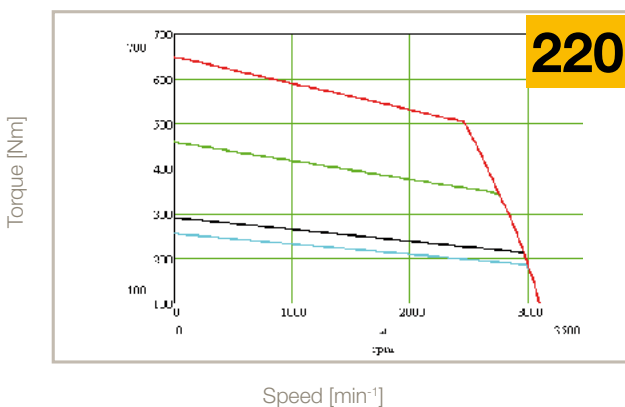
3000 min⁻¹ 400 V



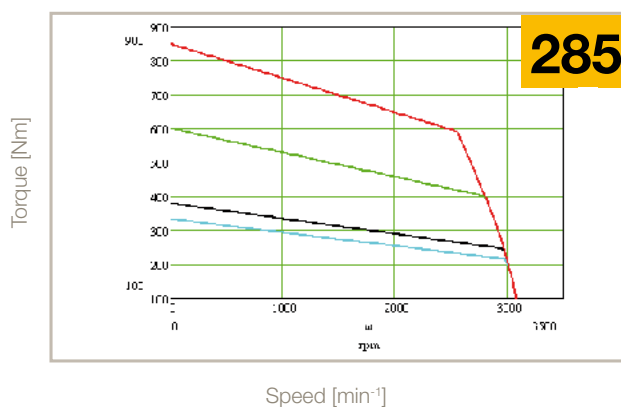
3000 min⁻¹ 400 V



3000 min⁻¹ 400 V

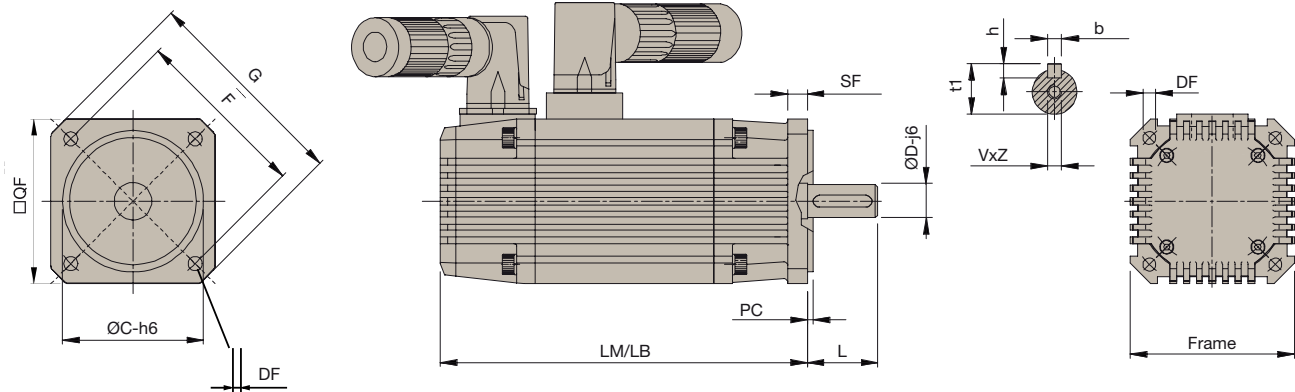


3000 min⁻¹ 400 V



- S1 65 K, ΔT
- S3 10 %, 5 min, 400 V
- S3 50 %, 5 min
- S3 20 %, 5 min

Dimensions



Motor - Size		LM/LB	Weight	DxL	bxh	t1	VxZ	C	F	DF	G	SF	PC	QF	Order code QF	
MB / MH	56	0,2	130.5/181.5	0.7	9x20 11x23	3x3 4x4	10.2 12.5	M4x10	40	63	5.5	74	6.5	2.5	56	5
		0,4	150.5/201.5	1												
		0,6	170.5/221.5	1.3												
	70	0,5	158/214	2	11x23 14x30	4x4 5x5	12.5 16	M4x10 M4x12.5	60	75	6	90	8.5	2.5	70	5
		01	188/244	2.8												
		1,5	218/274	3.5												
		02	248/304	4.3												
	105	02	186/250	5	19x40 24x50	6x6 8x7	21.5 27	M6x16 M8x19	95	115	9.5	140	10	3.5	105	5
		04	229/293	7					95	115	9.5	140	10	3.5	105	4
		06	273/337	9					80	115	9.5	140	10	3.5	105	9
		08	317/381	11					110	115	9.5	140	10	3.5	105	6
	145	04	200/274	8	19x40 24x50 28x60	6x6 8x7	21.5 27 31	M6x16 M8x19 M10x22	130	165	11.5	200	12	3.5	145	5
		08	231/305	12					130	165	11.5	200	12	3.5	145	4
		15	292/366	18					130	165	11.5	200	12	3.5	145	4
		22	354/428	23					130	165	11.5	200	12	3.5	145	4
	205	15	239/338	20	38x80 42x110	10x8 12x8	41 45	M12x32 M16x40	180	215	14	250	18	4	205	5
		28	273/372	29												
		50	342/441	44												
		70	411/510	59												
	265	75	340/475	89	48x110	14x9	51.5	M16x40	250	300	19	342	35	4	264	5
150		447/582	126													
220		554/689	164													
285		661/796	203													

LM: Motor length without brake with resolver
LB: Motor length with brake with resolver
DxL: Shaft
bxh: Key
t1: Overall shaft height
VxZ: Shaft hole depth

mm for dimensions, kg for weight

C: Center
F: Distance between center of holes clamp
DF: Fixing holes
G: Dimension in diagonal
SF: Flange thickness
PC: Centering depth
QF: Flange square

Options

Parker Mx family motors are available with standard and custom options to adapt motor on your application. If the option for your application is not listed, please consult our technical department.

Holding Brake

All MB, MH motors are available with an optional holding brake. Two different brake types exist, standard holding brake (option A) and special brake (option B) depending on the features of your application needs. Incorporated into the motor is the fail-safe holding brake (supply voltage 24 VDC $\pm 10\%$) which is applied when no voltage is present. Because of the power taken by the brake, torque values must be reduced by 5 % (10 % for size 265). The holding brake shall be used with the motor only at a standstill and not for dynamic braking. When used normally they are maintenance free.

Holding Brake ⁽¹⁾	Option	Voltage [V]	Current @20 °C [A]	Torque @20 °C [Nm]	Added Length [mm]	Added Weight [kg]	Torque derating of motor
M_56_A	A	24 $\pm 10\%$	0.32	0.6	51	0.8	5 %
M_56_B	B				n.a.		
M_70_A	A	24 $\pm 10\%$	0.53	2	56	1.1	5 %
M_70_B	B				n.a.		
M_105_A	A	24 $\pm 10\%$	1.1	10	64	3	5 %
M_105_B	B				n.a.		
M_145_A_04	A	24 $\pm 10\%$	1.8	4	74	5	5 %
M_145_A_08				8			
M_145_A_15				15			
M_145_A_22				22			
M_145_A_28				28			
M_145_B	B	24 $\pm 10\%$	0.75	22	74	5	5 %
M_205_A	A	24 $\pm 10\%$	1.35	90	99	14	5 %
M_205_B	B	24 $\pm 10\%$	1.2	120	99	14	5 %
M_265_A_75	A	24 $\pm 10\%$	2.9	225	135	30	10 %
M_265_A_150				450		35	
M_265_A_220							
M_265_A_285							
M_265_B	B				n.a.		

⁽¹⁾ If more than one option is required, please check with our technical department the feasibility.

Fan cooling

For high duty cycle applications, Parker offer 3 different types of cooling option: servo-ventilated, self ventilated and water cooled. With servo-ventilated the motors (order Code M_SV), an increase of 25 % torque and current based on nominal values (except for the maximum torque and current data) is provided. The servo-ventilated 205 motor is equipped with an external condenser for starting the fan.

With the self-ventilated option (order Code M_V), the torque is increased proportionally to the nominal speed.

For water-cooled motors (order code M_W, available only for size 145), consider a performance increase of approx. 100 % in the torque and current, except peak data.

Motor MB / MH	Option ⁽¹⁾	Voltage	Current [A]	Frequency [Hz]	Speed [min ⁻¹]	Added Length [mm]	Added Weight [kg]	Torque increasing of motor
105	SV	24 VDC $\pm 10\%$	0.17	n.a.	3000	64	1	25 %
	V	n.a.	n.a.	n.a.	n.a.	34	0.25	Depending of speed
145	SV	230 VAC Single Phase $\pm 10\%$	0.35	50	3000	97	2	25 %
	V	n.a.	n.a.	n.a.	n.a.	44	0.55	Depending of speed
205	SV	230 VAC Single Phase $\pm 10\%$	0.22	50	3000	109	2.2	25 %
	V	n.a.	n.a.	n.a.	n.a.	54	1.1	Depending of speed
265	SV	230 VAC Single Phase $\pm 10\%$	0.22	50	3000	109	2.2	25 %

⁽¹⁾ If more than one option is required, please check with our technical department the feasibility.

Feedback options

M_ motors are available with standard resolver feedback, but for different type of application we can offer the following types of feedback:

- Incremental Encoder with hall sensors
- Hiperface absolute encoder (single or multi-turn)
- EnDat absolute encoder (single or multi-turn)

Resolver

Poles	2
Transformation ratio	0.5
Operating temperature	-50...+150 °C
Motor associations	all sizes

Incremental Encoder with Hall Sensor

Code	A1	A2	A3	B1	C4
Resolution [C/T]	2000	2048	4096	3000	5000
Poles	8			4	8
System Accuracy	±32"	±32"	±16"	±22"	±13"
Voltage	+5 VDC ±5 % - 200 mA				
Reference Mark	Yes				
Max Speed [min ⁻¹]	6000				
Output Circuit	Line drive differential mode 20 mA				
Operating Temperature	-20...+100 °C	-20...+85 °C	-20...+100 °C		
M_ Motors Associations					
M_56	-	-	-	-	-
M_70	-	-	-	Δ 10 mm	-
M_105	✓	✓	✓	-	✓
M_145	✓	✓	✓	-	✓
M_205	✓	✓	✓	-	✓
M_265	-	-	-	-	-

- Not possible

✓ Possible without increment

Δ Possible with increment motor length

Hiperface Absolute Encoder

Code	S1	S2	A6	A7
Type	Optical			
Turn	Single	Multi	Single	Multi
Incremental Signals	1 V _{PP}			
Line Count	1024			
Resolution	32 768 (15 bit)		32 768 (15 bit)	
Absolute rotation	1	4096	1	4096
System Accuracy	±45"			
Power Supply	8 VDC			
Max Speed [min ⁻¹]	6000			
Temperature	-20...+115°C			
Safety integrity level:	SIL2 (IEC 61508), SILCL2 (IEC 62061)		Not Available	
MB / MH Motors Associations				
M_56	-	-	-	-
M_70	Δ 10 mm	Δ 10 mm	Δ 10 mm	Δ 10 mm
M_105	Δ 19 mm	Δ 19 mm	Δ 19 mm	Δ 19 mm
M_145	Δ 19 mm	Δ 19 mm	Δ 19 mm	Δ 19 mm
M_205	Δ 19 mm	Δ 19 mm	Δ 19 mm	Δ 19 mm
M_265	-	-	-	-

- Not possible

✓ Possible without increment

Δ Possible with increment motor length

EnDat Absolute Encoder

Code	B9	C1	D5
Type	Inductive	Optical	
Turn	Multi	Single	Multi
Incremental Signals	1V _{PP}		
Line Count	32	512	
Positions per revolutions	131 072 (17 bit)	8192 (13 bit)	
Distinguishable revolutions	4096	1	4096
System Accuracy	±400"	±60"	
Power Supply	5 VDC		
Max Speed [min ⁻¹]	12 000		7 000
Temperature	-20...+115 °C	-40...+115 °C	-30...+115 °C
Absolute position values	EnDat 2.1	EnDat 2.2	
Safety integrity level:	not available		
M_Motors Associations			
M_56	-	-	-
M_70	-	-	-
M_105	Δ 19 mm	Δ 19 mm	Δ 19 mm
M_145	✓	Δ 19 mm	Δ 19 mm
M_205	Δ 19 mm	Δ 19 mm	Δ 19 mm
M_265	-	-	✓

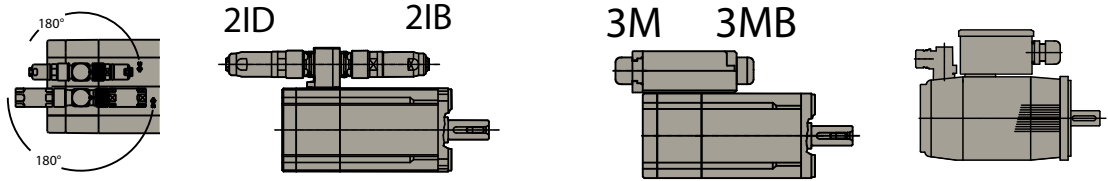
- Not possible
- ✓ Possible without increment
- Δ Possible with increment motor length

Technical specifications for High inertia

Option Inertia	Added ...	Unit	105				145				205					265			
			02	04	06	08	04	08	15	22	28	15	28	50	70	90	75	150	205
M	Inertia	[kgmm ²]	140				790				4400					on request			
	Length	[mm]	0				0				0					on request			
	Weight	[kg]	0.340				0.990				2.065					on request			
ML	Inertia	[kgmm ²]	530		n.a.		1770		n.a.		12 100			n.a.		n.a.			
	Length	[mm]	64		n.a.		74		n.a.		99			n.a.		n.a.			
	Weight	[kg]	1.5		n.a.		3.3		3.6		n.a.		7.6		11.9		n.a.		n.a.

Layout and connectors

M_ motors are available with different combinations of connectors and layout, depending of size of motor and the application




	2x Parallel upright connectors 2I	2x Forward facing connectors 2IB	2x Rear facing connectors 2ID	Terminal box rear facing 3M	Terminal box forward facing 3MB	Terminal box forward facing 3I
MB_56	-	✓	✓	-	-	-
MB_70	✓	-	-	✓	✓	-
MB_105	✓	-	-	✓	✓	-
MB_145	✓	-	-	✓	✓	✓
MB_205	-	-	-	✓	✓	✓
MB_265	-	-	-	✓	-	-
MH_56	-	✓	✓	-	-	-
MH_70	✓	-	-	-	-	-
MH_105	✓	-	-	-	-	-
MH_145	-	-	-	-	-	✓
MH_205	-	-	-	-	-	✓
MH_265	-	-	-	✓	-	-
ME_70	✓	-	-	-	-	-
ME_105	✓	-	-	-	-	-
ME_145	✓	-	-	-	-	✓
ME_205	-	-	-	-	-	✓
ME_265	-	-	-	✓	-	-

- Not possible
- ✓ Possible without increment
- Δ Possible with increment motor length

Shaft

M_ motors are available with or without key option; shafts are available in different sizes suitable for your existing machine or gearbox

Increased Safety

M_ motors size 105 and 145 are also available with increased safety which conform to ATEX.... directive 94/9/CE  II 2G Ex e II T3 with environment temperature between -20 and +40 °C
Only with drive HIDX. The feature and characteristics of the MBX motors are different from the standard version. For more info please consult technical department of Parker EME.

Custom options

Flange and shafts

In addition to the standard product it is possible to specify a fully customized mechanical interface for the motor ie flange, shaft and mounting holes. This option requires technical collaboration between the customer and Parker.

KIT (frameless) options

We can also supply our motors as only stator + rotor. Our mechanical team will develop / propose the right solution for your mechanical application which integrates into the existing elements of the machine.

A second output shaft / external encoder mount

Certain applications need a second shaft on the rear of motor; for this reason with M_ motors we offer alternative solutions for adding existing feedback or other mechanical accessories. For more details contact your Parker sales engineer.

Order Code

MB / MH Motors

To ensure that you select the correct motor we recommend that you have the following information.

- Diagram speed / time of load cycle to identify the type of the cycle (S1, S3 or others)
- Information about inertia load system
- Check the duty cycle - acceleration/deceleration
- Calculate the average torque and peak torque of the system
- Calculate the average speed and maximum speed of the cycle
- Check the temperature and altitude of environment / application
- Check the mechanical compatibility

With these preliminary data you can start to choose the motor (with the correct drive) for your application.

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18
Order example	MB	x	A	V	205	11	28	5	9		2IB			64	A1			2

1 Type Of Motor (mandatory field)

ME	Motor with Encoder ME Series
MB	Motor with Resolver MB Series
MH	Motor with Resolver MH Series

2 EX Protection

empty field	Standard motor no EX Certification
x	Motor with EX Certification (increased protection safety) (only for 105 and 145 without the holding brake at 3000 min ⁻¹) (only with HIDX...)

3 Brake Option

empty field	No Brake Option
A	Motor with Holding Brake (brakes when the supply voltage is 0)
B	Motor with BINDER Holding Brake (size145 up to 15Nm and 205)

4 Cooling Option

empty field	no cooling option
V	Motor with shaft-drive fan cooling
SV	Motor with (single-phase) motorised fan cooling
W	Water cooled motor (only size 145)

5 Motor Frame Size (mandatory field)

56	Torque range 0.2...0.6 Nm
70	Torque range 0.5...2,5 Nm
105	Torque range 2.2...8 Nm
145	Torque range 4.5...28 Nm
205	Torque range 15...90 Nm
265	Torque range 75...265 Nm

6 Winding (mandatory field)

nn	min ⁻¹ (x100) except for size 205 1150 min ⁻¹ which is only 11
-----------	--

7 Motor Torque (mandatory field)

nn	Torque in Nm
-----------	--------------

8 Flange (mandatory field)

5	B5 Flange
6	116 mm Flange, only for frame 105
9	96 mm Flange, only for frame 105

9 Shaft (mandatory field)

9	9x20 mm for size 56
11	11x23 mm for size 56/70
14	14x30 mm for size 70
19	19x40 mm for size 105/145
24	24x50 mm for size 105/145
28	28x60 mm for size 145
38	38x80 mm for size 205
42	42x110 mm for size 205
48	48x110 mm for size 265
A*	Special shaft under request

10 Key Shaft option

empty field	Shaft with key
S	Shaft without key

11 Layout - Connectors (mandatory field)

2I	Interconnectron rotatables receptacles (not for size 56 - 265 and 205 with brake)
3M	Terminal Box - opposite shaft glands
3MB	Terminal Box -toward shaft glands
2IB	90° Interconnectron receptacles - forward facing
2ID	90° Interconnectron receptacles - rear facing
3I	Terminal Box + Interconnectron 90° (not for size 56 - 265)
3MBS	Terminal Box + Interconnectron 90° (only for size 265)

12 Female connectors option

empty field	With Female / flying connectors
W	Without Female / flying connectors

13 Form Option

empty field	no Foot Mount Option
3	B3 - Foot Mount Option

14 Protection Degree (mandatory field)

64	IP64
65	IP65

15 Feedback

empty field	Resolver (Standard) not for ME motors
A1	Tamagawa OIH48 2000 ppr / on request - No Stock
A2	Tamagawa OIH48 2048 ppr for size 105/145/205
A3	Tamagawa OIH48 4096 ppr for size 105/145/205
A6	Stegman SRS50 Hiperface Single-Turn for size 70/105/145/205
A7	Stegman SRM50 Hiperface Multi-Turn for size 70/105/145/205
B1	Encoder 3000 ppr + Hall - TAMAGAWA OIH35
B9	SinCos EnDat Encoder Multi-Turn - HEIDENHAIN EQI1331
C1	SinCos EnDat Encoder Single-Turn - HEIDENHAIN EQI1113
C4	Encoder 5000 ppr + Hall - TAMAGAWA OIH48
D5	SinCos EnDat Encoder Multi-Turn - HEIDENHAIN EQN1325
S1	SinCos Hiperface Encoder Single-Turn - STEGMANN SRS50S
S2	SinCos Hiperface Encoder Multi-Turn - STEGMANN SRS50S

16 Option Inertia

empty field	Standard Inertia
M	Medium Inertia
ML	High Inertia

17 Special Option

empty field	No Special Option
1Bxx	Motor with 2-side output shaft Where xx is the diameter of second shaft
Exx	Prearrangement for external encoder mounting; where xx is the model of feedback

18 Voltage

0A	24 V
0B	34 V
0C	48 V
0D	50 V
0E	60 V
0F	72 V
0G	74 V
0	80 V
0H	96 V
1A	108-110 V
1D	120 V
1B	125 V
1C	150 V
1	180 V
2	220-230 V
2A	222 V
2B	200 V
3	330 V
4	380-400 V
4A	425 V
4C	460 V
4B	490 V

Cables and connectors are part of the accessories required for Parker motors; for different combination we offer propose different types of cables for signals and power. Below you will find the code structure.

Motor Power Cable for MB Motors

	1	2	3	4	5	6	7
Order example	CAVOMOT	A	1,5x	5	PM-	I	40

1 Cable	CAVOMOT	Power cable drive - motor
2 Brake wire	empty field	without brake wire
	A	Brake wire
3 Section [mm²]	1,5x	1,5 mm ²
	2,5x	2,5 mm ²
	4x, 6x, 10x	4 mm ² , 6 mm ² , 10 mm ²
	25x	25 mm ² (not for "PM" type)
4 Length [m]	1, ...	Length in metre
5 Application Type	PF-	Standard cable
	PM-	Highflex cable
6 Motor Connector	M	Military Connector (Mil) (all layout except 08 and 5]
	8	Military Connector (Mil) (all layout 8]
	I	Interconnectron Connector (all layout)
	3	Terminal Connection Box (all layout except 3M/3MB/3MC/3MA)
	S	Terminal Connection Box layout 3M/3M/3MC/3MA
	SY	Terminal Connection for MBX motors (Cable no ATEX)
	SL	Terminal connection box layout 6i only for MB / MH205 motor
	F	Fast Connector
	A	Amphenol Connector (layout 0P, 1A, 1C, 2DA, ...)
	T	Trilogy Connector
	SL	Terminal connection box layout 6i only for MB / MH205 motor
	PRM	Patch Cord Military Connector (Mil) (all layout except 08]
7 Motor Size	40..265	Motor Size

Feedback Cable for MB Motors

	1	2	3	4	5
Order example	CAVORES	4	PM-	I	SLVDN

1 Signal Cable type	CAVORES	Resolver
	CAVOENC	Incremental encoder
	CAVOABS	Absolute Encoder EnDat+SinCos
	CAVOHIP	Absolute Encoder Hiperface+SinCos
	CAVOSIN	SinCos Encoder
	CAVOHAL	SinCos Encoder + Hall sensor
2 Length [m]	1, ...	Length in metre
3 Application Type	PM	Moving Application
4 Motor Connector	M	Military Connector (Mil) (all layout except 08]
	8	Military Connector (Mil) (all layout 8]
	I	Interconnectron Connector (all layout)
	S	Terminal Connection Box layout 3M/3M/3MC/3MA and motor MBX
	F	Fast Connector
	A	Amphenol Connector (layout 0P, 1A, 1C, 2DA, ...)
	T	Trilogy Connector
	NX	Motors NX2-3-4-6-8 type NX----AKR7---
	E	Free signal cable for EX motors
	PRM	Patch Cord Military Connector (Mil) (all layout except 08]
5 Drive Type	LVD	LVD Drive
	HPD	HPD Drive
	SLVD	SLVD and SLVD-N Drive
	SLVDN	SLVD-N Drive
	TPD	TPD-M
	SPD/TWIN	TWIN-N and SPD-N Drive or wire without connector drive side
	HIDRIVE	Hi-Drive
	631	Servodrives 631
	638	Servodrives 638
	637F	Servodrives 637F

Motor Power Cable for MH Motors

	1	2
Order example	MOK	55/02

1	Cable	
	MOK	Motor cable ⁽²⁾
2	Type	
		for MH56 / MH70 / MH105 ⁽³⁾
	55/....⁽¹⁾	1.5 mm ² ; up to 13.8 A
	54/....⁽¹⁾	1.5 mm ² ; up to 13.8 A Moving application
	56/....⁽¹⁾	2.5 mm ² ; up to 18.9 A
	57/....⁽¹⁾	2.5 mm ² ; up to 18.9 A Moving application
		for MH145 / MH205 ⁽⁴⁾
	60/....⁽¹⁾	1.5 mm ² ; up to 13.8 A
	63/....⁽¹⁾	1.5 mm ² ; up to 13.8 A Moving application
	59/....⁽¹⁾	2.5 mm ² ; up to 18.9 A
	64/....⁽¹⁾	2.5 mm ² ; up to 18.9 A Moving application
	61/....⁽¹⁾	6 mm ² ; up to 32.3 A Moving application
	62/....⁽¹⁾	10 mm ² ; up to 47.3 A Moving application

MOK55 and MOK54 are also possible for linear motors LXR406, LXR412 and BLMA.

Length code for cables

⁽¹⁾ Length code 1 (Example: SSK01/09 = length 25 m)

Length [m]	1,0	2,5	5,0	7,5	10,0	12,5	15,0	20,0	25,0	30,0	35,0	40,0	45,0	50,0
Order code	01	02	03	04	05	06	07	08	09	10	11	12	13	14

⁽²⁾ Color according to DESINA

⁽³⁾ with motor connector

⁽⁴⁾ with cable eye for motor terminal box

Feedback Cable for MH Motors

	1
Order example	REK42/02

1	Signal Cable type
	for MH-Motors
	REK42/....⁽¹⁾ Resolver cable ⁽²⁾
	REK41/....⁽¹⁾ Resolver cable ⁽²⁾ Moving application
	GBK24/....⁽¹⁾ SinCos© Feedback cable ⁽²⁾ Moving application
	GBK38/....⁽¹⁾ EnDat 2.1 Feedback cable ⁽²⁾ Moving application
	GBK23/....⁽¹⁾ Encoder cable ⁽²⁾
	for linear motors
	GBK33/....⁽¹⁾ Feedback cable for LXR Moving application
	GBK32/....⁽¹⁾ Feedback cable for BLMA Moving application

Low Cogging Servo Motor - NX Series

Overview

Description

NX Series brushless servomotors from Parker combine exceptional precision and motion quality, high dynamic performance and very compact dimensions. A large set of torque / speed characteristics, options and customization possibilities are available, making NX Series servomotors the ideal solution for most servosystems applications.

Advantages

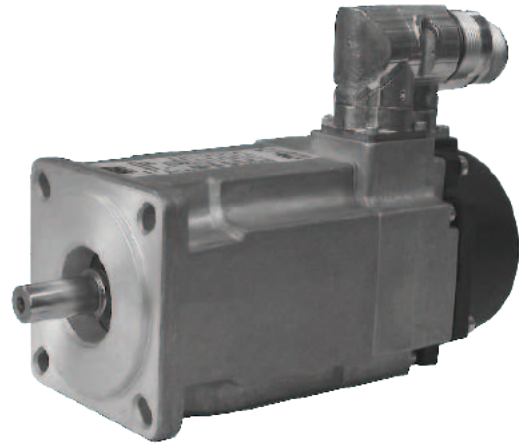
- High precision and motion quality
- High dynamic performance
- Compact robust
- Large set of options and customization possibilities
- CE and UL marking certification available

Applications

- Life Science Diagnostic
- Tooling Machines
- Pulp & Paper
- Renewable Energy
- Aerospace
- Radiation Hardend
- Marine
- Continuous Process
- Mobile Hybrid Solutions

Features

- **Mounting**
 - Flange with clearance holes
- **Shaft end**
 - Plain smooth shaft (standard)
 - Plain keyed shaft (option)
- **Cooling**
 - Natural ventilation
 - Forced ventilation (NX860V only)
- **Feedback sensors**
 - Resolver (standard)
 - Absolute EnDat, Hiperface, Encoder
 - Posivex (only with Digivex Motion)
- **Other options**
 - Brake
 - Thermal protection (PTC, Thermo Switch or KTY)



Technical Characteristics - Overview

Motor type	Permanent magnet synchronous servomotors	
Rotor design	Rotor with concentrated-flux rare earth magnets	
Number of poles	10	
Power range	0.2...13.7 kW	
Torque range	0.45...64 Nm	
Speed range	0...7500 min ⁻¹	
Protection level (IEC60034-5)	<ul style="list-style-type: none"> • IP64 (standard) • IP65 (option) • IP44 (ventilated version) 	
Marking	CE	UL
Voltage supply	230/400 VAC	230/480 VAC
Temperature class (IEC60034-1)	<ul style="list-style-type: none"> • Class F 	<ul style="list-style-type: none"> • Class A (NX1-2) • Class F (NX3-8)
Connections	<ul style="list-style-type: none"> • Connectors (standard) • Flying cables (option) • Terminal box (option) 	<ul style="list-style-type: none"> • Connectors (NX1-8) • Terminal box (NX860V)

NX1-NX2 CE Motors

Technical Data

Rated Speed N_N [min ⁻¹]	Stall Torque M_0^* [Nm]	Rated Torque M_N [Nm]	Peak Torque N_{max} [Nm]	Stall Current I_0^* [A _{RMS}]	Rated Current I_N [A _{RMS}]	Peak Current I_{max} [A _{RMS}]	Rated Power P_N [kW]	Moment of Inertia J [kgmm ²]	Product Code							
230 VAC supply voltage - mono or three-phased																
6000	0.45	0.33	1.72	0.99	0.78	3.96	0.21	13	NX110E	■	P	■	■	■	■	■
5000	0.45	0.37	2	1.01	0.84	5.08	0.19	21	NX205E	■	V	■	■	■	■	■
7500	0.45	0.29	2	1.4	0.95	7.01	0.23	21	NX205E	■	S	■	■	■	■	■
4000	1	0.80	3.4	1.34	1.11	5.35	0.34	28	NX210E	■	T	■	■	■	■	■
6000	1	0.61	3.4	1.99	1.32	7.96	0.38	38	NX210E	■	P	■	■	■	■	■
400 VAC supply voltage - three-phase																
8900	0.45	0.23	2	1.40	0.79	7.01	0.21	21	NX205E	■	S	■	■	■	■	■
6000	1	0.61	3.4	1.34	0.89	5.35	0.38	38	NX210E	■	T	■	■	■	■	■
7000	1	0.5	3.4	2.75	1.53	11	0.37	38	NX210E	■	G	■	■	■	■	■

* Mounting on aluminium flange: 280 x 280 x 8 mm (NX1-2), Temperature <40 °C near motor's flange

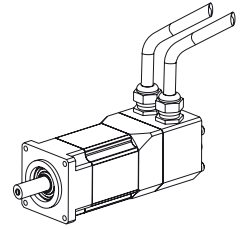
Drive Associations

Motor	Rated Speed N_N [min ⁻¹]	Compax3		SLVD-N		638
		Drive reference	Max. Speed [min ⁻¹]	Drive reference	Max. Speed [min ⁻¹]	Drive reference
230 VAC supply voltage - mono or three-phased						
NX110E■P■■■■■	6000	C3S025V2...	6000	SLVD1N	5400	638A-01-3-F-0-STO...
NX205E■V■■■■■	5000	C3S025V2...	5000	SLVD1N	5000	638A-01-3-F-0-STO...
NX205E■S■■■■■	7500	C3S025V2...	7500	-	-	638A-02-3-F-0-STO...
NX210E■T■■■■■	4000	C3S025V2...	3420	SLVD2N	3420	638A-02-3-F-0-STO...
NX210E■P■■■■■	6000	C3S025V2...	5530	SLVD2N	5400	638A-02-3-F-0-STO...
400 VAC supply voltage - three-phased						
NX205E■S■■■■■	8900	C3S015V4...	8900	-	-	638B-03-6-F-0-STO...
NX210E■T■■■■■	6000	C3S015V4...	6000	-	-	638B-03-6-F-0-STO...
NX210E■G■■■■■	7000	C3S038V4...	7000	-	-	638B-05-6-F-0-STO...

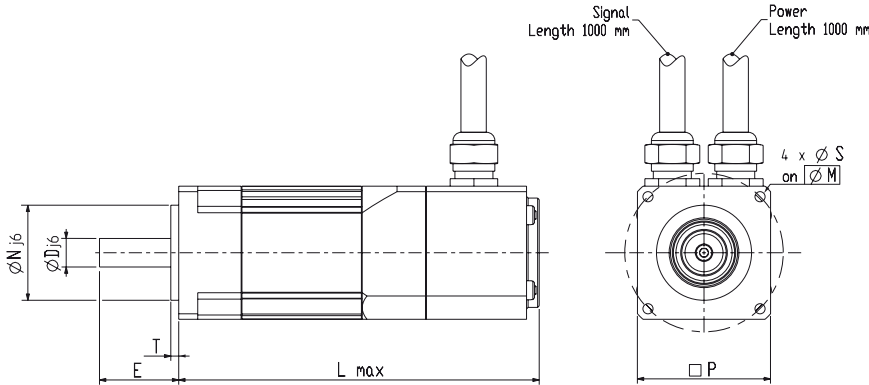
Dimensions

NX1 and NX2 - wires with shielded sleeve

Motor	N [mm]	M [mm]	D [mm]	E [mm]	T [mm]	P [mm]	S [mm]	Without brake		With brake		Fr* [daN]	Fa* [daN]
								Weight [kg]	L [mm]	Weight [kg]	L [mm]		
NX110	30	50	9	25	2.5	42.5	3.2	0.8	110	1	141	15	6.9
NX205	40	63	11	25	2.5	56.5	5.5	0.8	100	1.1	137	28	15.5
NX210	40	63	11	25	2.5	56.5	5.5	1.3	120	1.6	157	30	16.7

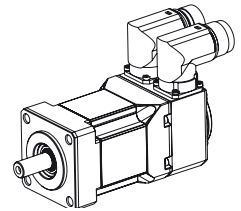


* Fr and Fa not cumulative: At 1500 min⁻¹ for a bearing service life of 20000 hours

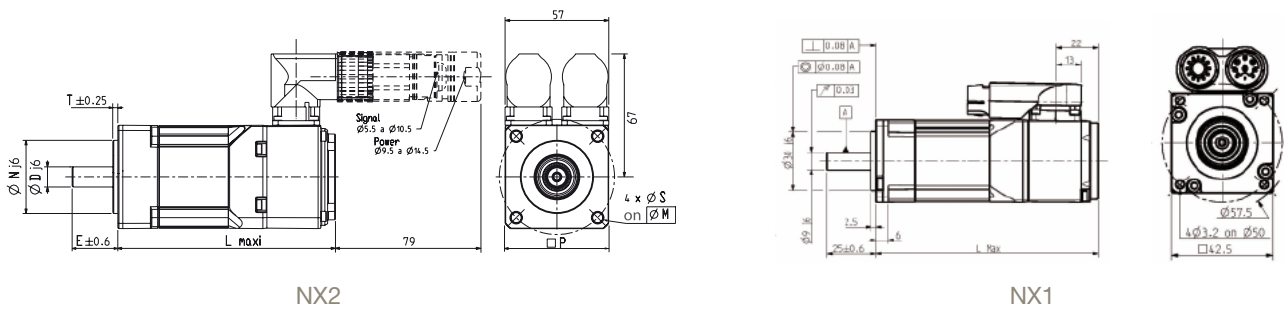


NX 1 and NX2 - connector version

Motor	N [mm]	M [mm]	D [mm]	E [mm]	T [mm]	P [mm]	S [mm]	Without brake		With brake		Fr* [daN]	Fa* [daN]
								Weight [kg]	L [mm]	Weight [kg]	L [mm]		
NX110	30	50	9	25	2.5	42.5	3.2	0.8	110	1	141	15	6.9
NX205	40	63	11	25	2.5	56.5	5.5	0.8	100	1.1	137	28	15.5
NX210	40	63	11	25	2.5	56.5	5.5	1.3	120	1.6	157	30	16.7



* Fr and Fa not cumulative: At 1500 min⁻¹ for a bearing service life of 20000 hours



Order Code

NX1, NX2, CE - Natural Cooling Version

	1	2	3	4	5	6	7	8
Order example	NX110E	A	P	R	7	0	1	0

1 Motor type

NX110E see table NX1-NX2 CE Motors
NX205E "Technical data"
NX210E

2 Feedback sensor

A 2 pole resolver (standard)
K Without sensor
Q Absolute multi-turn HIPERFACE
 16 ppr SEL37 (NX2 on request)
R Absolute single-turn HIPERFACE
 encoder 128 ppr SKS36
 (on request)
S Absolute multi-turn HIPERFACE
 encoder 128 ppr SKM36
 (on request)
V Absolute single-turn EnDat encoder
 ECN 1113 (on request)
W Absolute multi-turn EnDat encoder
 EQN 1125 (on request)

3 Motor type

P see table NX1-NX2 CE Motors
V "Technical data"
S
 ...

4 Painting

R Unpainted (standard)
B Black mat (on request)

5 Connections/Ventilation

1 Flying cables/No
4 Wires with shielded sleeve/No
7 Connectors (standard)/No

6 Brake

0 Without brake
3 With brake

7 Protection degree

0 IP64 (standard)
1 IP65

8 Shaft end

0 Smooth shaft (standard)
1 Keyed shaft

NX1-NX2 UL Motors

Technical Data

Rated Speed N_N [min ⁻¹]	Stall Torque M_0^* [Nm]	Rated Torque M_N [Nm]	Peak Torque M_{max} [Nm]	Stall Current I_0^* [A _{RMS}]	Rated Current I_N [A _{RMS}]	Peak Current I_{max} [A _{RMS}]	Rated Power P_N [kW]	Moment of Inertia J [kgmm ²]	Product Code							
230 VAC supply voltage - mono or three-phased																
5000	0.31	0.09	1.72	0.97	0.34	1.72	0.05	130	NX110A	■	J	■	7	■	■	■
5000	0.40	0.21	2	0.91	0.52	5.5	0.11	210	NX205A	■	V	■	7	■	■	■
4000	0.70	0.41	3.4	1	0.61	5.58	0.17	380	NX210A	■	T	■	7	■	■	■
480 VAC supply voltage - three-phased																
6600	0.4	0.11	2	0.91	0.32	5.5	0.08	210	NX205A	■	V	■	7	■	■	■
6000	0.7	0.15	3.4	1	0.27	5.58	0.09	380	NX210A	■	T	■	7	■	■	■

* Mounting on aluminium flange: 280 x 280 x 8 mm (NX1-2), Temperature <40 °C near motor's flange

Drive Associations

Motor	Rated Speed N_N [min ⁻¹]	Compax3		SLVD-N		638
		Drive reference	Max. Speed [min ⁻¹]	Drive reference	Max. Speed [min ⁻¹]	Drive reference
230 VAC supply voltage - mono or three-phased						
NX110A■J■7■	5000	C3S025V2...	5000	SLVD1N	5000	638A-01-3-F-0-STO...
NX205A■V■7■	5000	C3S025V2...	5000	SLVD1N	5000	638A-01-3-F-0-STO...
NX210A■T■7■	4000	C3S025V2...	3420	SLVD1N	3420	638A-01-3-F-0-STO...
480 VAC supply voltage - three-phased						
NX205A■V■7■	6600	-	-	-	-	-
NX210A■T■7■	6000	-	-	-	-	-

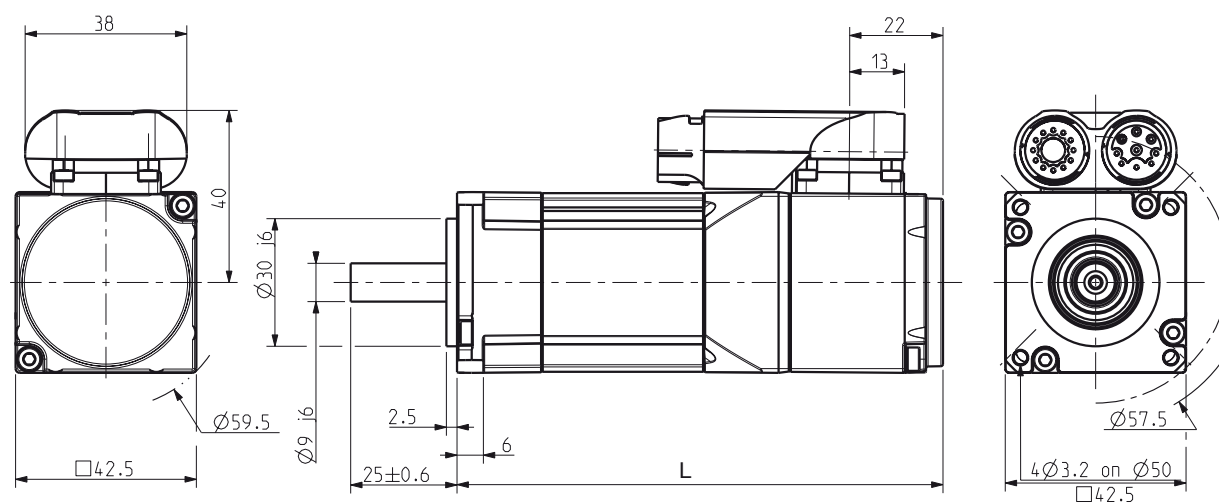
Dimensions

NX1- NX2 - connector version													
Motor	N [mm]	M [mm]	D [mm]	E [mm]	T [mm]	P [mm]	S [mm]	Without brake		With brake		Fr* [daN]	Fa* [daN]
								Weight [kg]	L [mm]	Weight [kg]	L [mm]		
NX110	-	-	-	-	-	-	-	0.8	134	1	141	15	6.9
NX205	40	63	11	25	2.5	56.5	5.5	0.8	129	1.1	137	28	15.5
NX210	40	63	11	25	2.5	56.5	5.5	1.3	149	1.6	157	30	16.7

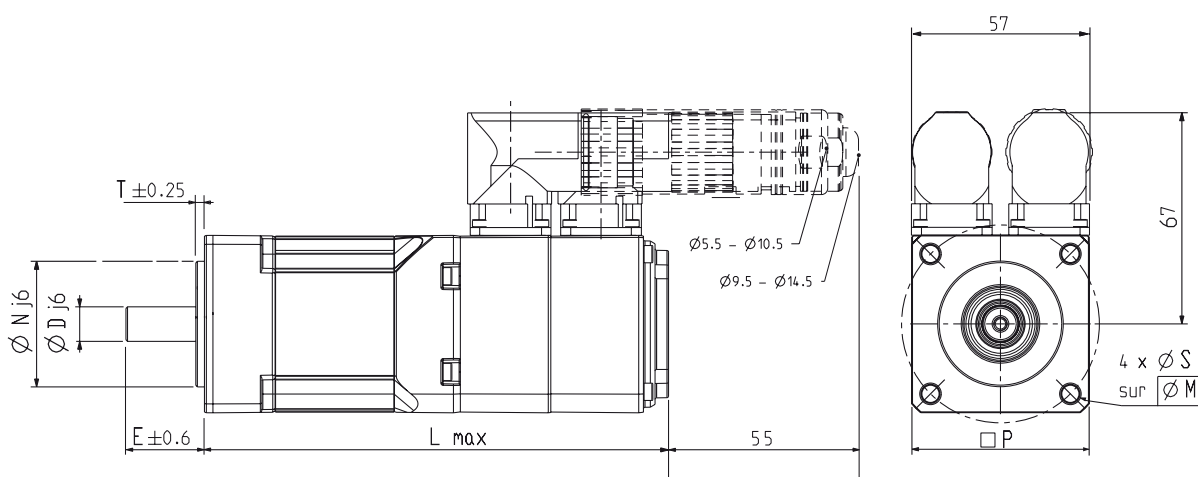


* Fr and Fa not cumulative: At 1500 min⁻¹ for a bearing service life of 20 000 hours

NX1 - connector version



NX2 - connector version



Order Code

NX1, NX2, UL - Natural Cooling Version

	1	2	3	4	5	6	7	8
Order example	NX110A	A	J	R	7	0	0	0

1 Motor type	NX110A	see table NX1-NX2 UL Motors
	NX205A	"Technical data"
	NX210A	
2 Feedback sensor	A	2 pole resolver (standard)
	K	Without sensor
	Q	Absolute multi-turn HIPERFACE 16ppr SEL37 (NX2 on request)
	R	Absolute single-turn HIPERFACE encoder 128 ppt SKS36 (NX2 only)
	S	Absolute multi-turn HIPERFACE encoder 128 ppt SKM36 (NX2 only)
	V	Absolute single-turn EnDat encoder ECN 1113 (NX2 only)
	W	Absolute multi-turn EnDat encoder EQN 1125 (NX2 only)
3 Motor type	J	see table NX1-NX2 UL Motors
	V	"Technical data"
	T	
4 Painting	R	Unpainted (standard)
	B	Black mat (on request)
5 Connector	7	Standard
6 Brake	0	Without brake
	3	With brake
7 Protection degree	0	IP64 (standard)
	1	IP65
8 Shaft end	0	Smooth shaft (standard)
	1	Keyed shaft

NX3-NX8 CE and UL Motors

Technical Data

Rated Speed N_N [min ⁻¹]	Stall Torque M_0^* [Nm]	Rated Torque M_N [Nm]	Peak Torque M_{max} [Nm]	Stall Current I_0^* [A _{RMS}]	Rated Current I_N [A _{RMS}]	Peak Current I_{max} [A _{RMS}]	Rated Power P_N [kW]	Moment of Inertia J [kgmm ²]	Product Code								
230 VAC supply voltage - mono or three-phased																	
2300	2	1.8	6.6	1.39	1.27	5.56	0.43	79	NX310E	■	P	■	■	■	■	■	■
4000	2	1.65	6.6	2.43	2.06	9.71	0.69	79	NX310E	■	K	■	■	■	■	■	■
6600	2	1.4	6.6	3.85	2.85	15.4	0.97	79	NX310E	■	X	■	■	■	■	■	■
2300	4	3.53	13.4	2.71	2.41	10.9	0.85	290	NX420E	■	P	■	■	■	■	■	■
4000	4	3.14	13.4	4.69	3.74	18.8	1.32	290	NX420E	■	J	■	■	■	■	■	■
550	5.5	5.45	18.8	1.41	1.4	5.64	0.31	426	NX430E	■	V	■	■	■	■	■	■
3200	5.5	4.68	18.8	5.24	4.53	21	1.57	426	NX430E	■	J	■	■	■	■	■	■
3400	5.5	4.59	18.8	5.64	4.78	22.5	1.64	426	NX430E	■	H	■	■	■	■	■	■
4000	5.5	4.29	18.8	6.64	5.28	26.5	1.80	426	NX430E	■	F	■	■	■	■	■	■
2200	8	7.42	26.7	5.31	4.99	21.2	1.71	980	NX620E	■	R	■	■	■	■	■	■
4000	8	6.08	26.7	9.89	7.82	39.5	2.55	980	NX620E	■	J	■	■	■	■	■	■
1450	12	10.73	40	5.25	4.75	21	1.63	1470	NX630E	■	R	■	■	■	■	■	■
2800	12	9.21	40	9.86	7.8	39.4	2.70	1470	NX630E	■	K	■	■	■	■	■	■
4000	12	7.6	40	13.9	9.31	55.6	3.18	1470	NX630E	■	G	■	■	■	■	■	■
1000	16	15.38	50	5.16	4.99	20.3	1.61	3200	NX820E	■	X	■	■	■	■	■	■
2200	16	14.48	50	11	10.04	43.2	3.34	3200	NX820E	■	R	■	■	■	■	■	■
3600	16	13.24	50	17.5	14.82	69.1	4.99	3200	NX820E	■	L	■	■	■	■	■	■
1200	258	25.54	92	10.1	9.27	39.9	3.21	6200	NX840E	■	Q	■	■	■	■	■	■
1700	20.5	20.5	92	11.1	11.24	59.8	3.65	6200	NX840E	■	L	■	■	■	■	■	■
2200	28	22.88	92	18.9	15.7	74.8	5.27	6200	NX840E	■	J	■	■	■	■	■	■
2600	41	27.47	137	33	22.72	132	7.48	9200	NX860E	■	D	■	■	■	■	■	■
400 VAC supply voltage - three-phase																	
4000	2	1.65	6.6	1.39	1.18	5.56	0.69	79	NX310E	■	P	■	■	■	■	■	■
9800	2	0.71	6.6	3.38	1.42	13.5	0.72	79	NX310E	■	I	■	■	■	■	■	■
2000	4	3.60	13.4	1.36	1.23	5.47	0.75	290	NX420E	■	V	■	■	■	■	■	■
4000	4	3.14	13.4	2.71	2.16	10.9	1.32	290	NX420E	■	P	■	■	■	■	■	■
7500	4	1.90	13.4	5.43	2.16	10.9	1.49	290	NX420E	■	X	■	■	■	■	■	■
1000	5.5	5.38	18.8	1.41	1.38	5.64	0.56	426	NX430E	■	V	■	■	■	■	■	■
3000	5.5	4.77	18.8	2.82	2.48	11.3	1.50	426	NX430E	■	P	■	■	■	■	■	■
4000	5.5	4.29	18.8	3.78	3.01	15.1	1.80	426	NX430E	■	L	■	■	■	■	■	■
6000	5.5	2.98	18.8	6.64	3.76	26.5	1.87	426	NX430E	■	F	■	■	■	■	■	■
2000	8	7.52	26.7	2.83	2.69	11.3	1.58	980	NX620E	■	V	■	■	■	■	■	■
3900	8	6.17	26.7	5.31	4.25	21.2	2.52	980	NX620E	■	R	■	■	■	■	■	■
5700	8	4.10	26.7	9.89	5.56	39.5	1.93	980	NX620E	■	J	■	■	■	■	■	■
6000	8	3.68	26.7	12.1	6.19	48.3	2.31	980	NX620E	■	D	■	■	■	■	■	■
1350	12	10.83	40	2.62	2.4	10.5	1.53	1470	NX630E	■	V	■	■	■	■	■	■
2700	12	9.34	40	5.25	4.2	21	2.64	1470	NX630E	■	R	■	■	■	■	■	■
4000	12	7.60	40	7.92	5.3	31.6	3.18	1470	NX630E	■	N	■	■	■	■	■	■
5000	12	6.07	40	13.9	7.64	55.6	3.18	1470	NX630E	■	G	■	■	■	■	■	■
1900	16	14.72	50	5.16	4.79	20.3	2.93	3200	NX820E	■	X	■	■	■	■	■	■
3900	160	12.94	50	11	9.07	43.2	5.28	3200	NX820E	■	R	■	■	■	■	■	■
2100	28	23.17	92	10.1	8.47	39.9	5.10	6200	NX840E	■	Q	■	■	■	■	■	■
3100	20.5	20.50	92	11.1	11.09	59.8	6.49	6200	NX840E	■	L	■	■	■	■	■	■
3500	28	18.56	92	16.8	11.51	66.5	6.80	6200	NX840E	■	K	■	■	■	■	■	■
4500	28	14.00	65	21.7	-	-	6.60	6200	NX840E	■	H	■	■	■	■	■	■
1700	41	34.10	137	14.8	12.44	59.2	6.07	9200	NX860E	■	L	■	■	■	■	■	■
2600	41	27.47	137	18.5	12.78	74	7.48	9200	NX860E	■	J	■	■	■	■	■	■
3200	41	21.89	137	27	14.88	108	7.34	9200	NX860E	■	F	■	■	■	■	■	■

* Mounting on aluminium flange: 400 x 400 x 12 mm (NX3-8) Temperature <40 °C near motor's flange

Rated Speed N_N [min ⁻¹]	Stall Torque $M_{I_0^*}$ [Nm]	Rated Torque M_N [Nm]	Peak Torque $M_{I_{max}}$ [Nm]	Stall Current $I_{I_0^*}$ [A _{RMS}]	Rated Current I_N [A _{RMS}]	Peak Current $I_{I_{max}}$ [A _{RMS}]	Rated Power P_N [kW]	Moment of Inertia J [kgmm ²]	Product Code							
480 VAC supply voltage - three-phase																
4800	2.00	1.57	6.6	1.39	1.13	5.56	0.79	79	NX310E	■	P	■	■	■	■	■
2300	4.00	3.53	13.4	1.36	1.21	5.47	0.85	290	NX420E	■	V	■	■	■	■	■
4700	4.00	2.96	13.4	2.71	2.05	10.9	1.46	290	NX420E	■	P	■	■	■	■	■
1200	5.50	5.34	18.8	1.41	1.37	5.64	0.67	426	NX430E	■	V	■	■	■	■	■
3500	5.50	4.55	18.8	2.82	2.37	11.3	1.67	426	NX430E	■	P	■	■	■	■	■
4600	5.50	3.95	18.8	3.78	2.78	15.1	1.90	426	NX430E	■	L	■	■	■	■	■
2300	8.00	7.36	26.7	2.83	2.64	11.3	1.77	980	NX620E	■	V	■	■	■	■	■
4500	8.00	5.57	26.7	5.31	3.89	21.2	2.62	980	NX620E	■	R	■	■	■	■	■
5700	8.00	4.10	26.7	9.89	5.56	39.5	2.45	980	NX620E	■	J	■	■	■	■	■
1500	12.00	10.68	40	2.62	2.37	10.5	1.68	1470	NX630E	■	V	■	■	■	■	■
3100	12.00	8.84	40	5.25	4	21	2.87	1470	NX630E	■	R	■	■	■	■	■
4600	12.00	6.70	40	7.92	4.74	31.6	3.23	1470	NX630E	■	N	■	■	■	■	■
2100	16.00	14.56	50	5.16	4.75	20.3	3.20	3200	NX820E	■	X	■	■	■	■	■
4600	16.00	12.22	50	11	8.62	43.2	5.89	3200	NX820E	■	R	■	■	■	■	■
2400	28.00	22.27	92	10.1	8.17	39.9	5.60	6200	NX840E	■	Q	■	■	■	■	■
4000	28.00	16.65	92	16.8	10.43	66.5	6.97	6200	NX840E	■	K	■	■	■	■	■
3000	41.00	23.85	137	18.5	11.22	74	7.49	9200	NX860E	■	J	■	■	■	■	■

* Mounting on aluminium flange: 400 x 400 x 12 mm (NX3-8) Temperature <40 °C near motor's flange

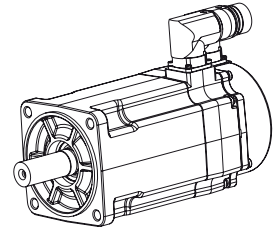
Motors
NX Series

Drive Associations

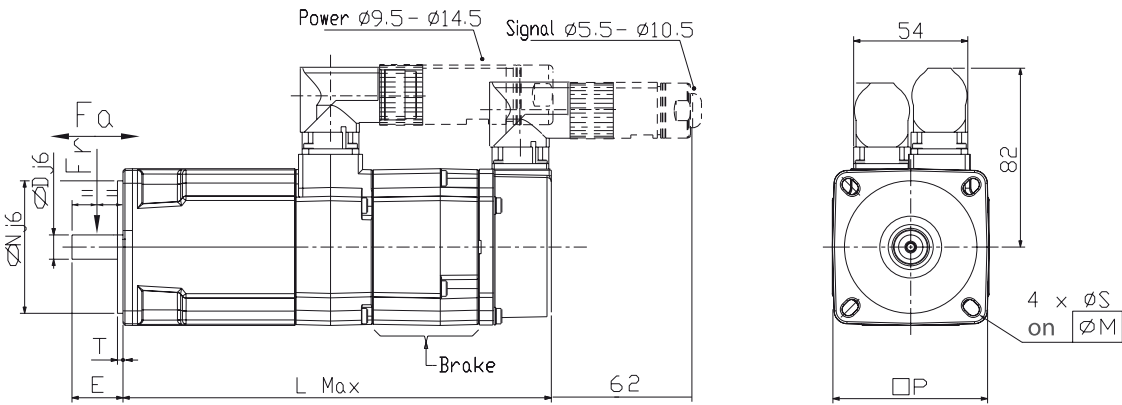
Motor	Rated Speed N _N [min ⁻¹]	Compax3		SLVD-N		638
		Drive reference	Max. Speed [min ⁻¹]	Drive reference	Max. Speed [min ⁻¹]	Drive reference
230 VAC supply voltage - mono or three-phased						
NX310E■P■■■■■■	2300	C3S025V2...	1930	SLVD2N	1930	638A-02-3-F-0-STO
NX310E■K■■■■■■	4000	C3S025V2...	3600	SLVD2N	3600	638A-04-3-F-0-STO
NX310E■X■■■■■■	6600	C3S063V2...	5590	-	-	638A-04-3-F-0-STO
NX420E■P■■■■■■	2300	C3S063V2...	1990	SLVD5N	1990	638A-04-3-F-0-STO
NX420E■J■■■■■■	4000	C3S063V2...	3620	SLVD5N	3620	638A-04-3-F-0-STO
NX430E■V■■■■■■	550	C3S025V2...	550	SLVD2N	550	638A-02-3-F-0-STO
NX430E■J■■■■■■	3200	C3S063V2...	2860	SLVD7N	2860	638A-06-3-F-0-STO
NX430E■H■■■■■■	3400	C3S063V2...	3110	SLVD7N	3110	638A-06-3-F-0-STO
NX430E■F■■■■■■	4000	C3S100V2...	3700	SLVD7N	3700	-
NX620E■R■■■■■■	2200	C3S063V2...	1880	SLVD7N	1880	638A-06-3-F-0-STO
NX620E■J■■■■■■	4000	C3S100V2...	3670	SLVD10N	3670	-
NX630E■R■■■■■■	1450	C3S063V2...	1320	SLVD7N	1320	638A-06-3-F-0-STO
NX630E■K■■■■■■	2800	C3S100V2...	2600	SLVD10N	2600	-
NX630E■G■■■■■■	4000	C3S150V2...	3750	SLVD15N	3750	-
NX820E■X■■■■■■	1000	C3S063V2...	890	SLVD7N	890	638A-06-3-F-0-STO
NX820E■R■■■■■■	2200	C3S150V2...	2000	SLVD15N	2000	-
NX820E■L■■■■■■	3600	-	3310	-	-	-
NX840E■Q■■■■■■	1200	C3S100V2...	1060	SLVD10N	1060	-
NX840E■L■■■■■■	1700	C3S150V2...	1630	SLVD15N	1630	-
NX840E■J■■■■■■	2200	-	2070	-	-	-
NX860E■D■■■■■■	2600	-	2510	-	-	-
400 VAC supply voltage - three-phased						
NX310E■P■■■■■■	4000	C3S015V4...	3570	-	-	638B-03-6-F-0-STO
NX310E■I■■■■■■	9800	C3S038V4...	9510	-	-	638B-05-6-F-0-STO
NX420E■V■■■■■■	2000	C3S015V4...	1710	-	-	638B-03-6-F-0-STO
NX420E■P■■■■■■	4000	C3S038V4...	3630	-	-	638B-05-6-F-0-STO
NX420E■X■■■■■■	7500	C3S075V4...	7500	-	-	638B-08-6-F-0-STO
NX430E■V■■■■■■	1000	C3S015V4...	1000	-	-	638B-03-6-F-0-STO
NX430E■P■■■■■■	3000	C3S038V4...	2670	-	-	638B-05-6-F-0-STO
NX430E■L■■■■■■	4000	C3S038V4...	3650	-	-	638B-05-6-F-0-STO
NX430E■F■■■■■■	6000	C3S075V4...	6000	-	-	638B-08-6-F-0-STO
NX620E■V■■■■■■	2000	C3S038V4...	1730	-	-	638B-05-6-F-0-STO
NX620E■R■■■■■■	3900	C3S075V4...	3440	-	-	638B-08-6-F-0-STO
NX620E■J■■■■■■	5700	C3S150V4...	5700	-	-	638B-10-6-F-0-STO
NX620E■D■■■■■■	6000	C3S150V4...	6000	-	-	-
NX630E■V■■■■■■	1350	C3S038V4...	1150	-	-	638B-05-6-F-0-STO
NX630E■R■■■■■■	2700	C3S075V4...	2390	-	-	638B-08-6-F-0-STO
NX630E■N■■■■■■	4000	C3S150V4...	3710	-	-	638B-10-6-F-0-STO
NX630E■G■■■■■■	5000	C3S150V4...	5000	-	-	-
NX820E■X■■■■■■	1900	C3S075V4...	1620	-	-	638B-08-6-F-0-STO
NX820E■R■■■■■■	3900	C3S150V4...	3600	-	-	638B-15-6-F-0-STO
NX840E■Q■■■■■■	2100	C3S150V4...	1910	-	-	638B-10-6-F-0-STO
NX840E■L■■■■■■	3100	C3S150V4...	2930	-	-	638B-15-6-F-0-STO
NX840E■K■■■■■■	3500	C3S300V4...	3270	-	-	-
NX840E■H■■■■■■	4500	C3S300V4...	4290	-	-	-
NX860E■L■■■■■■	1700	C3S150V4...	1700	-	-	-
NX860E■J■■■■■■	2600	C3S300V4...	2440	-	-	-
NX860E■F■■■■■■	3200	C3S300V4...	3200	-	-	-

Dimensions

NX3, NX4, NX6													
Motor	N [mm]	M [mm]	D [mm]	E [mm]	T [mm]	P [mm]	S [mm]	Without brake		With brake		Fr* [daN]	Fa* [daN]
								Weight [kg]	L [mm]	Weight [kg]	L [mm]		
NX310	60	75-80	11	23	2.5	71	5.5	2	147	2.4	195	36	20
NX420	80	100	19	40	3	91.5	7	3.7	175	4.5	226	72	24
NX430	80	100	19	40	3	91.5	7	4.6	200	5.4	251	82	24
NX620	110	130	24	50	3.5	121	9	6.9	181	8	236	82	52
NX630	110	130	24	50	3.5	121	9	8.8	210	10	265	86	54

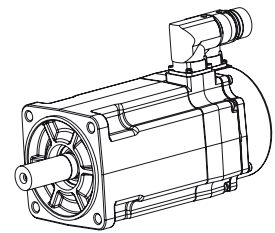


* Fr and Fa not cumulative: At 1500 min⁻¹ for a bearing service life of 20000 hours

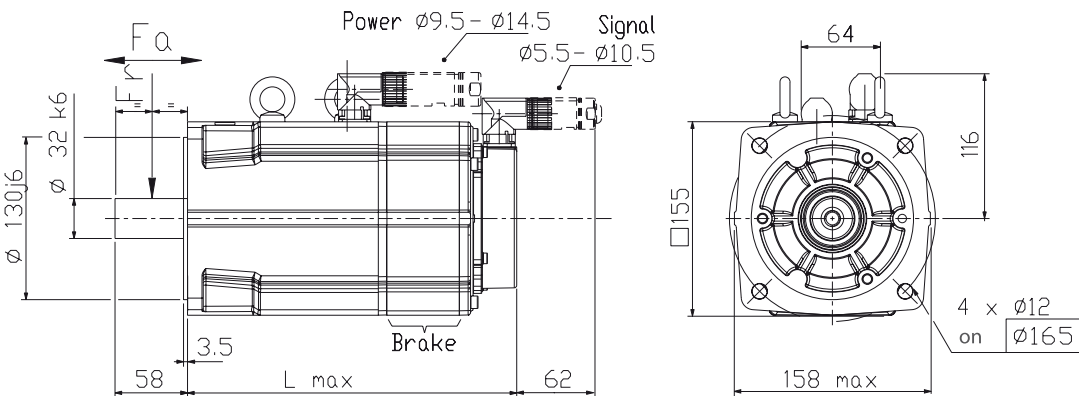


Motors
NX Series

NX8						
Motor	Without brake		With brake		Fr* [daN]	Fa* [daN]
	Weight [kg]	L [mm]	Weight [kg]	L [mm]		
NX820	13	200	16.5	266	151	28
NX840	20	260	23.5	326	165	33
NX860	27	320	30.5	386	172	37



* Fr and Fa not cumulative: At 1500 min⁻¹ for a bearing service life of 20000 hours



Order Code

NX3-NX8, CE, UL - Natural Cooling Version

	1	2	3	4	5	6	7	8
Order example	NX310E	A	P	R	7	0	0	0

1 Motor type

NX310E	see table NX3-NX8 CE and UL Motors
NX420E	"Technical data"
NX430E	
...	

2 Feedback sensor

A	2 pole resolver (standard)
K	Without sensor (on request)r
Q	Absolute multi-turn HIPERFACE 16 ppr SEL37 (on request)
R	Absolute single-turn HIPERFACE encoder 128 ppr SKS36
S	Absolute multi-turn HIPERFACE encoder 128 ppr SKM36
T	Absolute single-turn HIPERFACE encoder 1024 ppr SRS50 (on request)
U	Absolute multi-turn HIPERFACE encoder 1024 ppr SRM50 (on request)
V	Absolute single-turn EnDat encoder ECN 1113
W	Absolute multi-turn EnDat encoder EQN 1125

3 Motor type

P	see table NX3-NX8 CE and UL Motors
K	"Technical data"
X	
...	

4 Painting

R	Unpainted (standard)
B	Black mat (on request)

5 Connections/Ventilation

1	Shielded cables/No
7	Connectors (standard)/No

6 Brake/Thermal Protection

0	Without brake (standard)/ No protection
1	Without brake/PTC on power connection
2	Without brake/Thermo switch on power connection (on request)
3	With brake/No protection
4	With brake/PTC on power connection
5	With brake/Thermo switch on power connection (on request)
A	Without brake/PTC on sensor connection (not available for UL version)
B	Without brake/Thermo switch on sensor connection (on request) (not available for UL version)
C	Without brake/KTY on sensor connector (not available for UL version)
D	With brake/PTC on sensor connection (not available for UL version)
E	With brake/Thermo switch on sensor connection (on request) (not available for UL version)
F	With brake/KTY on sensor connection (not available for UL version)

7 Protection degree

0	IP64 (standard)
1	IP65

8 Shaft end

0	Smooth shaft (standard)
1	Keyed shaft

NX8 CE and UL Motors - Ventilated Version

Technical Data

Rated Speed N_N [min ⁻¹]	Stall Torque M_0 [Nm]	Rated Torque M_N [Nm]	Peak Torque M_{max} [Nm]	Stall Current I_0 [A _{RMS}]	Rated Current I_N [A _{RMS}]	Peak Current I_{max} [A _{RMS}]	Rated Power P_N [kW]	Moment of Inertia J [kgmm ²]	Product Code							
230 VAC supply voltage - mono or three-phased																
1450	64.00	57.50	137	29.3	26.4	74	8.73	9200	NX860V	■	J	■	■	■	■	■
400 VAC supply voltage - three-phased																
2600	64.00	50.52	137	29.3	23.22	74	13.76	9200	NX860V	■	J	■	■	■	■	■
3750	64.00	41.78	137	42.7	28.11	108	16.40	9200	NX860V	■	F	■	■	■	■	■
480 VAC supply voltage - three-phased																
3000	64.00	47.67	137	29.3	21.95	74	14.98	9200	NX860V	■	J	■	■	■	■	■
4400	64.00	36.09	137	42.7	24.47	108	16.63	9200	NX860V	■	F	■	■	■	■	■

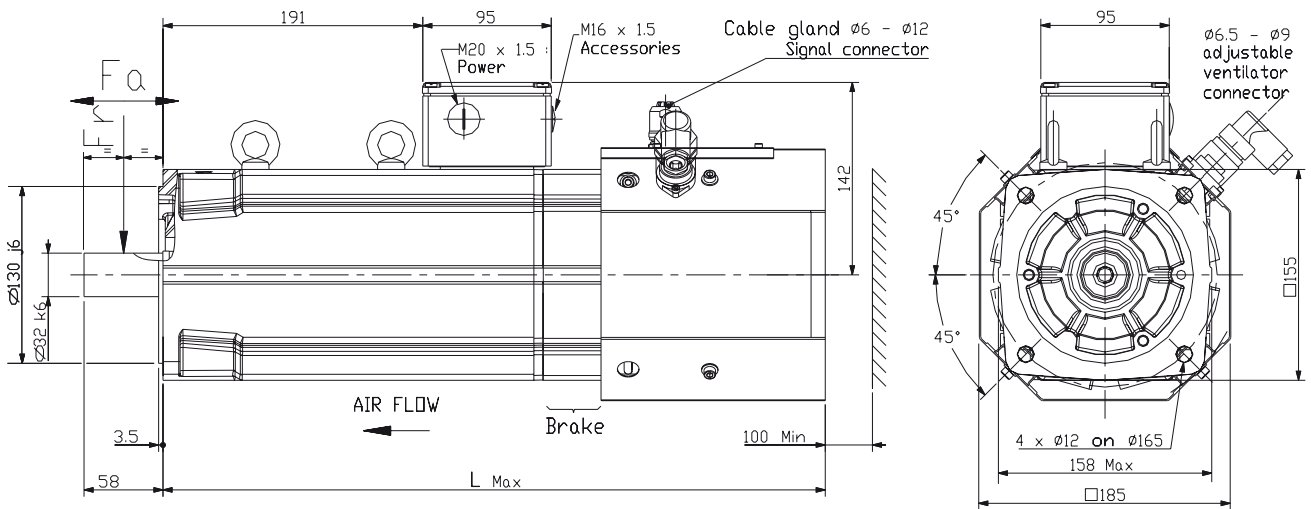
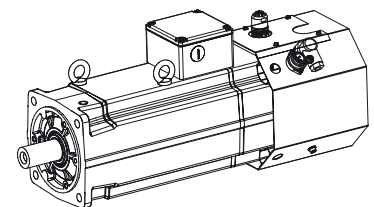
Drive Associations

Motor	Rated Speed N_N [min ⁻¹]	Compax3		SLVD-N		638
		Drive reference	Max. Vitesse [min ⁻¹]	Drive reference	Max. Vitesse [min ⁻¹]	Drive reference
230 VAC supply voltage - mono or three-phased						
NX860V■J■■■■■	1450	C3S300V4...	-	-	-	-
400 VAC supply voltage - three-phased						
NX860V■J■■■■■	2600	C3S300V4...	2230	-	-	-
NX860V■F■■■■■	3750	C3H050V4...	-	-	-	-
480 VAC supply voltage - three-phased						
NX860V■J■■■■■	3000	-	-	-	-	-
NX860V■F■■■■■	4400	-	-	-	-	-

Dimensions

NX8 - ventilated version						
Motor	without brake		with brake		Fr* [daN]	Fa* [daN]
	Mass [kg]	L [mm]	Mass [kg]	L [mm]		
NX860V	30.5	424	34	490	172	37

* Fr and Fa not cumulative: At 1500 min⁻¹ for a bearing service life of 20000 hours



Order Code

NX8, CE, UL - Ventilated Version

	1	2	3	4	5	6	7	8
Order example	NX860V	A	J	R	9	0	0	0

1 Motor type

NX860V NX brushless servomotor

2 Feedback sensor

A	2 pole resolver (standard)
K	Without sensor (on request)
Q	Absolute multi-turn HIPERFACE 16 ppr SEL37 (on request)
R	Absolute single-turn HIPERFACE encoder 128 ppr SKS36
S	Absolute multi-turn HIPERFACE encoder 128 ppr SKM36
T	Absolute single-turn HIPERFACE encoder 1024 ppr SRS50 (on request)
U	Absolute multi-turn HIPERFACE encoder 1024 ppr SRM50 (on request)
V	Absolute single-turn EnDat encoder ECN 1113
W	Absolute multi-turn EnDat encoder EQN 1125

3 Motor type

J see table NX8 CE and UL Motors
F ventilated version "Technical data"

4 Painting

R	Unpainted (standard)
B	Black mat (on request)

5 Connections

5	UL power terminal box + feedback connector
9	CE power terminal box + feedback connector

6 Brake/Thermal protection

0	Without brake (standard)/ No protection
1	Without brake/PTC on power connection
2	Without brake/Thermo switch on power connection (on request)
3	With brake/No protection
4	With brake/PTC on power connection
5	With brake/Thermo switch on power connection (on request)
A	Without brake/PTC on sensor connection (not available for UL version)
B	Without brake/Thermo switch on sensor connection (on request) (not available for UL version)
C	Without brake/KTY on sensor connection (not available for UL version)
D	With brake/PTC on sensor connection (not available for UL version)
E	With brake/Thermo switch on sensor connection (on request) (not available for UL version)
F	With brake/KTY on sensor connection (not available for UL version)

7 Protection degree

0 IP44

8 Shaft end

0	Smooth shaft (standard)
1	Keyed shaft

Accessoires et Options

Motor Power Cable

	1	2	3	4	5	6	7	8
Code example	C	C3	U	P1	F1	R	0	005

1 Type	C	Cable
	P	Extension cable
2 Drive type	C3	Compax3
	D1	Digivex
	S2	638
	S4	AC890
	S5	SLVD
3 Characteristic	U	PUR jacket class 6 (standard)
4 Power cable	P0	For NX1
	P1	For NX <15 A _{rms}
	P2	For NX <21 A _{rms}
5 Motor connector	F1	For NX2-NX8 motors
	F4	For NX1 motor
6 Section	R	Fixed
7 Fixed field	0	
8 Cable length *	001	1 m
	...	
	050	50 m

Feedback Cable

	1	2	3	4	5	6	7	8
Code example	C	C3	U	A1	F1	R	0	005

1 Type	C	Cable
	P	Extension cable
2 Drive type	C3	Compax3
	D1	Digivex
	S2	638
	S4	AC890
	S5	SLVD
3 Characteristic	U	PUR jacket class 6 (standard)
4 Feedback cable	A1	Resolver
	V1	EnDat encoder
	R1	Hiperface encoder
5 Motor connector	F1	For motor with resolver or Hiperface
	F3	For motor with EnDat
	F4	For NX1 motor
6 Section	R	Fixed
7 Fixed field	0	
8 Cable length *	001	1 m
	...	
	050	50 m

(*) The 3 last digits indicate cable length in meters ± 5 %max
For non-standard length cable with length different from: 1/2/3/4/5/10/15/20/25/30/40/50 m please contact us.
Example CC3UP1F1R0015: power cable, length = 15 m.



Feedback Sensors for CE and UL Motors

2 poles resolver - option A

- Accuracy: $\pm 10'$ max
- Transformation ratio: $0.5 \pm 5\%$
- Max. operating speed: $17\,000\text{ min}^{-1}$
- Working temperature range: $-55\dots+155\text{ }^\circ\text{C}$
- Compatibility: NX1 to NX8

Single turn / Multiturn absolute encoder HIPERFACE SKS/SKM36 - option R/S

- Number of sine/cosine periods per revolution: 128
- Absolute position per revolution: 4096 (12 bits)
- Number of absolutely encodable revolutions: 4096 (SKM36)
- Max. operating speed SKS36: $12\,000\text{ min}^{-1}$
- Max. operating speed SKM36: $9\,000\text{ min}^{-1}$
- Working temperature range: $-20\dots+110\text{ }^\circ\text{C}$
- Compatibility: NX2 to NX8

Single turn / Multiturn absolute encoder EnDat ECN1113/EQN1125 - option V/W

- Number of sine/cosine periods per revolution: 512
- Absolute position per revolution: 8192 (13 bits)
- Number of absolutely encodable revolutions: 4096
- Accuracy: $\pm 60''$
- Absolute position value EnDat 2.2
- Max. operating speed: $12\,000\text{ min}^{-1}$
- Working temperature range: $-40\dots+115\text{ }^\circ\text{C}$
- Compatibility: NX2 to NX8

Single turn / Multiturn absolute encoder HIPERFACE SRS/SRM50 - option T/U (on request)

- Number of sine/cosine periods per revolution: 1024
- Number of absolutely encodable revolutions: 4096 (SRM50)
- Absolute position per revolution: 32768 (15 bits)
- Working speed up to which the absolute position can be reliably determined: $6\,000\text{ min}^{-1}$
- Max. operating speed: $12\,000\text{ min}^{-1}$
- Working temperature range: $-20\dots+115\text{ }^\circ\text{C}$
- Compatibility: NX3 to NX8

Multiturn absolute encoder HIPERFACE SEL37 - option Q (on request)

- Number of sine/cosine periods per revolution: 16
- Number of absolutely encodable revolutions: 4096
- Working speed up to which the absolute position can be reliably determined: $6\,000\text{ min}^{-1}$
- Max. operating speed: $10\,000\text{ min}^{-1}$
- Working temperature range: $-20\dots+115\text{ }^\circ\text{C}$
- Compatibility: NX2 to NX8

Explosion Proof Servo Motor - EX Series

Overview

Description

EX series is a range of permanent magnet servo motor designed for use in explosive atmospheres. Featuring robust explosion-proof housings, EX motors are capable of bearing internal explosions with no risks of propagation to the neighbouring environment. Two versions are available, conforming with North American or European safety standards. EX servomotors are characterized by excellent motion quality, great acceleration / deceleration capabilities, and high torque output over a wide speed range. Various winding variants and numerous options are available to offer maximum flexibility.



Advantages

- Servo motors with explosion proof housings
- CE or UL versions available
- High dynamic performance
- Compact and robust
- Maintenance free

Applications

- Food, Pharma & Beverage
- Material Forming
- Printing Industry
- Hazardous / Ex Environment
- Painting robots

Features

- **Mounting**
 - Flange with clearance holes
- **Mechanical interface**
 - Solid smooth shaft (standard)
 - Solid shaft with key (option)
- **Feedback sensors**
 - 2 pole resolver (standard)
 - Absolute EnDat encoder (option)
 - Absolute Hiperface encoder (option)
- **Thermal protection**
 - Thermoswitches and thermofuses integrated in the windings
- **Other options**
 - Parking brake

Technical Characteristics - Overview

Motor type	Permanent magnet synchronous motors	
Number of poles	10	
Torque range	1.75 ... 35 Nm	
Speed range	2000...8000 min ⁻¹	
Marking	CE	UL
Voltage supply	230 / 400 VAC	230 / 480 VAC
Conformance	ATEX 94/9/EC Directive	UL 674 standard: Electric Motors and Generators for use in Division 1 Hazardous (Classified) Locations
	EN60079-0, EN60079-1, EN61241-0 and EN61241-1 standards	
Classification	II 2G Ex d IIB T4 IP64 (Gas)	Class 1, Division 1, Group C & D
	II 2GD Ex d IIB T4 IP65 Ex tD A21 IP65 T135 °C (Gas and dust)	
Ingress protection level	IP64 (standard)	IP65
	IP65 (option)	
Connections	Cable glands	Tapped holes


Standards

Hazardous Areas Classification

Dangerous Areas Identification

European directive 99/92/EC makes explicit the responsibility of employers to protect employees who may be exposed to risk of ATEX environments (Explosive Atmosphere). The employer must assess the risk and classify potentially dangerous areas. Equipment and materials must also be suited for use in dangerous areas in accordance with ATEX directive 94/9/EC.

Hazard	Permanent	Occasional	Unusal
Definition	Explosive atmospheres present continuously, for long periods or frequently	Explosive atmospheres are likely to occur	Explosive atmospheres are unlikely to occur or present only infrequently and for a short period only
Gas and vapour	Area 0	Area 1	Area 2
Dust	Area 20	Area 21	Area 22
Category	1 Very high level of protection	2 High level of protection	3 Normal level of protection

 EX motors can be used in these areas

Equipment identification

Ex series is a range of permanent magnets servomotors designed for use in explosive atmospheres and are CE marked in accordance with ATEX directive 94/9/CE. Two versions are available:

- Gaseous atmospheres: II2 G Ex d IIB T4 IP64 – Group IIA or IIB – category 2G– areas 1 and 2.
- Gaseous and dusty atmospheres: II2 GD Ex d IIB T4 IP65 and Ex tD A21 IP65 T135 °C –
- Group IIA or IIB – category 2GD – areas 21 and 22.

All devices intended for use in hazardous areas must have standard CE inspection certificates and more specifically bear an ATEX mark.



II	2	G	Ex	d	IIB	T4	IP64	
Equipment group and category		Area		Ex	Type of protection	Gas group		Temperature class*
I Mine	M1 Very high level of protection	G Gas Vapour	D Dust	Protection against explosions	o Oil immersion	I Mine	Methane	T1 450 °C
	M2 High level of protection				p Pressurized apparatus			T2 300 °C
II Surface	1 Very high level of protection				II Surface	d Flameproof enclosure	A Propane	T3 200 °C
	2 High level of protection					e Increased safety	B Ethylene	T4 135 °C
	3 Normal level of protection					m Encapsulation	C Hydrogen Acetylene	T5 100 °C
						i Intrinsic safety		T6 85 °C

* Maximum surface temperature

Additional Information for Servomotors in Dust Atmosphere

EX servomotors with IP65 option are designed for explosive atmospheres and are fitted with a lip seal at the customer shaft end.

With protection by enclosures «tD», they are designed to operate in combustible dust atmospheres, areas 21 and 22, («A21»).

In accordance with EN 6124-0: 2006 and EN 61241-1: 2004 standards.
Classification:
II2 D Ex tD A21 IP65 T135 °C

Classification of common combustible gases and vapours according to temperature class and explosion group

Group	Temperature class					
	T1	T2	T3	T4	T5	T6
I	Methane					
II A	Acetic acid Acetone Ammonia Benzene Carbon monoxide Ethane Ethyl... Methane Methanol Methyl... Naphtalene Propane Toluene Xylene	Butyl acetate Amylic alcohol Liquefied gas Natural gas Butane Ethyl alcohol	Cyclohexane Cyclohexanol Diesel fuels Gasoline Heptane Hexane Pentane Petroleum (depending on composition)	Acetaldehyde Ether		
II B	Coke gas	Butadiene Ethylene Ethylbenzene Ethylene oxide	Hydrogen sulphide Isoprene Petroleum (depending on composition)	Ethyl ether		
II C	Hydrogen	Acetylene				Carbon disulphide Ethyl nitrate

Compliance with North American standards

EX servomotors are CLASS 1, division 1, Groups C and D, explosion-proof apparatus designed to operate in explosive atmospheres in accordance with standard UL1004 and UL674.



Marking in accordance with Standard UL674

Class I	Division 1	Group C&D	Temperature class	
Class I Gas, vapour and liquids	Explosive atmospheres can exist all the time or some of the time under normal operating conditions	A Acetylene	T1 450 °C	IP65
		B Hydrogen	T2 300 °C	
		C Ethylene	T3 200 °C	
		D Propane	T4 135 °C	
E, F, G		T4A 120 °C		
Class II Dust			T5 100 °C	
Class III Fibers			T6 85 °C	

EX Servo Motors - CE Marked for Explosive Atmospheres

Technical Data

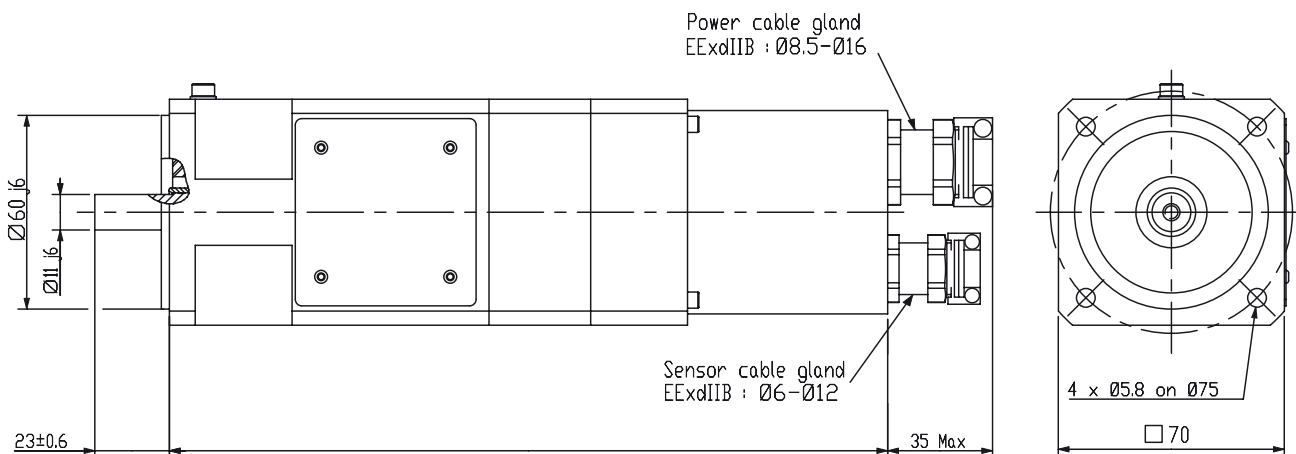
Rated Speed	Stall Torque	Stall Current	Rated Torque	Rated Current	Peak Torque	Peak Current	Max. Speed with Compax3	Moment of Inertia	Product Code					
N_{max} [min ⁻¹]	M_0 [Nm]	I_0 [A _{RMS}]	M_N [Nm]	I_N [A _{RMS}]	M_{max} [Nm]	I_{max} [A _{RMS}]	N_{max} [min ⁻¹]	J [kgmm ²]						
230 VAC power supply														
2300	1.75	1.24	1.66	1.19	6.6	5.64	1960	79	EX310E	■	PR1	■	■	■
4000	1.75	2.16	1.54	1.96	6.6	9.85	3630	79	EX310E	■	KR1	■	■	■
2300	3.5	2.46	3.18	2.26	13.4	11.3	2030	290	EX420E	■	PR1	■	■	■
4000	3.5	4.26	2.67	3.33	13.4	19.6	3700	290	EX420E	■	JR1	■	■	■
3200	4.8	4.57	3.74	3.68	18.8	21	2930	426	EX430E	■	JR1	■	■	■
4000	4.8	5.79	3.26	4.07	18.8	26.6	3790	426	EX430E	■	FR1	■	■	■
2500	7	5.51	5.49	4.47	26.7	24.8	2310	980	EX620E	■	OR1	■	■	■
3000	10.4	9.28	7.24	6.75	40	42.2	2860	1470	EX630E	■	IR1	■	■	■
2200	14	9.28	11.16	7.49	50	41.8	2050	3200	EX820E	■	RR1	■	■	■
3600	14	14.85	7.53	8.3	50	66.9	3430	3200	EX820E	■	LR1	■	■	■
2200	24.5	16	14.18	9.54	92	72.7	2120	6200	EX840E	■	JR1	■	■	■
2500	35	27.9	9	7.82	137	133	2500	9200	EX860E	■	DR1	■	■	■
400 VAC power supply														
4000	1.75	1.24	1.54	1.12	6.6	5.64	3600	79	EX310E	■	PR1	■	■	■
2000	3.5	1.24	3.22	1.15	13.4	5.68	1740	290	EX420E	■	VR1	■	■	■
4000	3.5	2.46	2.68	1.93	13.4	11.3	3720	290	EX420E	■	PR1	■	■	■
3000	4.8	2.46	3.9	2.03	18.8	11.3	2740	426	EX430E	■	PR1	■	■	■
4000	4.8	3.3	3.26	2.31	18.8	15.1	3740	426	EX430E	■	LR1	■	■	■
4300	7	5.51	3.13	2.75	26.7	24.8	4240	980	EX620E	■	OR1	■	■	■
2900	10.4	5.11	7.42	3.8	40	23.2	2750	1470	EX630E	■	YR1	■	■	■
4000	10.4	6.92	5.2	3.76	40	31.4	3820	1470	EX630E	■	NR1	■	■	■
2200	14	5.4	11.16	4.36	50	24.3	2080	3200	EX820E	■	WR1	■	■	■
3600	14	9.3	7.53	5.19	50	41.8	3600	3200	EX820E	■	RR1	■	■	■
2100	24.5	8.55	15	5.37	92	38.8	1950	6200	EX840E	■	QR1	■	■	■
3300	24.5	14.3	2.85	2.07	92	64.7	3300	6200	EX840E	■	KR1	■	■	■
2500	35	15.7	9	4.4	137	75	2500	9200	EX860E	■	JR1	■	■	■

Drive Associations

Motor	Rated Speed N_{max} [min ⁻¹]	Associated Drive Sizes				
		Compax3		SLVD-N		
		Drive	Max. Speed with Compax3 N_{max} [min ⁻¹]	Drive	Max. Speed with SLVD-N N_{max} [min ⁻¹]	
230 VAC power supply						
EX310E■PR1 ■■■■	2300	C3S025V2...	1960	SLVD1N	1960	
EX310E■KR1 ■■■■	4000	C3S025V2...	3630	SLVD2N	3630	
EX420E■PR1 ■■■■	2300	C3S025V2...	2030	SLVD2N	2030	
EX420E■JR1 ■■■■	4000	C3S063V2...	3700	SLVD5N	3700	
EX430E■JR1 ■■■■	3200	C3S063V2...	2930	SLVD5N	2930	
EX430E■FR1 ■■■■	4000	C3S063V2...	3790	SLVD7N	3790	
EX620E■OR1 ■■■■	2500	C3S063V2...	2310	SLVD7N	2310	
EX630E■IR1 ■■■■	3000	C3S100V2...	2860	SLVD10N	2860	
EX820E■RR1 ■■■■	2200	C3S100V2...	2050	SLVD10N	2050	
EX820E■LR1 ■■■■	3600	C3S150V2...	3430	SLVD15N	3430	
EX840E■JR1 ■■■■	2200	-	2120	SLVD17N	2120	
EX860E■DR1 ■■■■	2500	-	2500	-	-	
400 VAC power supply						
EX310E■PR1 ■■■■	4000	C3S015V4...	3600	-	-	
EX420E■VR1 ■■■■	2000	C3S015V4...	1740	-	-	
EX420E■PR1 ■■■■	4000	C3S038V4...	3720	-	-	
EX430E■PR1 ■■■■	3000	C3S038V4...	2740	-	-	
EX430E■LR1 ■■■■	4000	C3S038V4...	3740	-	-	
EX620E■OR1 ■■■■	4300	C3S075V4...	4240	-	-	
EX630E■YR1 ■■■■	2900	C3S075V4...	2750	-	-	
EX630E■NR1 ■■■■	4000	C3S075V4...	3820	-	-	
EX820E■WR1 ■■■■	2200	C3S075V4...	2080	-	-	
EX820E■RR1 ■■■■	3600	C3S150V4...	3600	-	-	
EX840E■QR1 ■■■■	2100	C3S150V4...	1950	-	-	
EX840E■KR1 ■■■■	3300	C3S150V4...	3300	-	-	
EX860E■JR1 ■■■■	2500	C3S300V4...	2500	-	-	

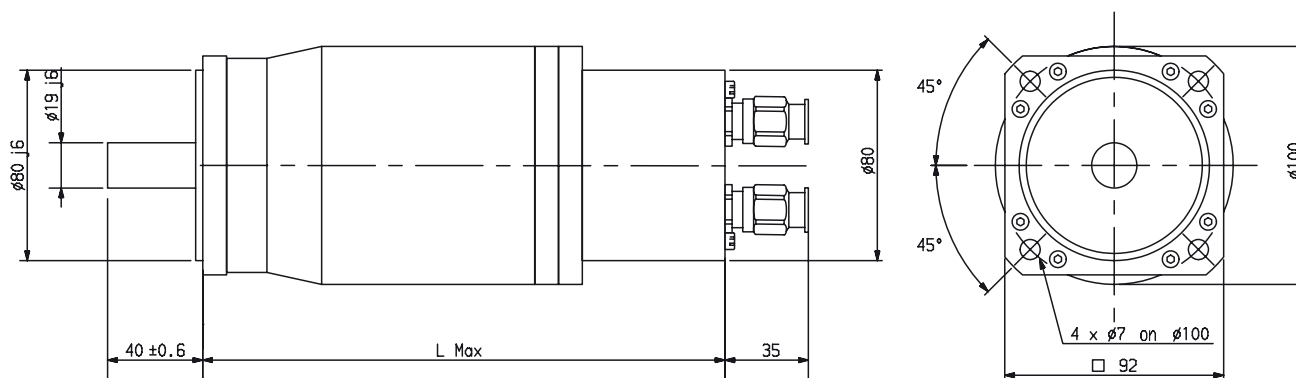
Dimensions (Resolver Version)

EX3



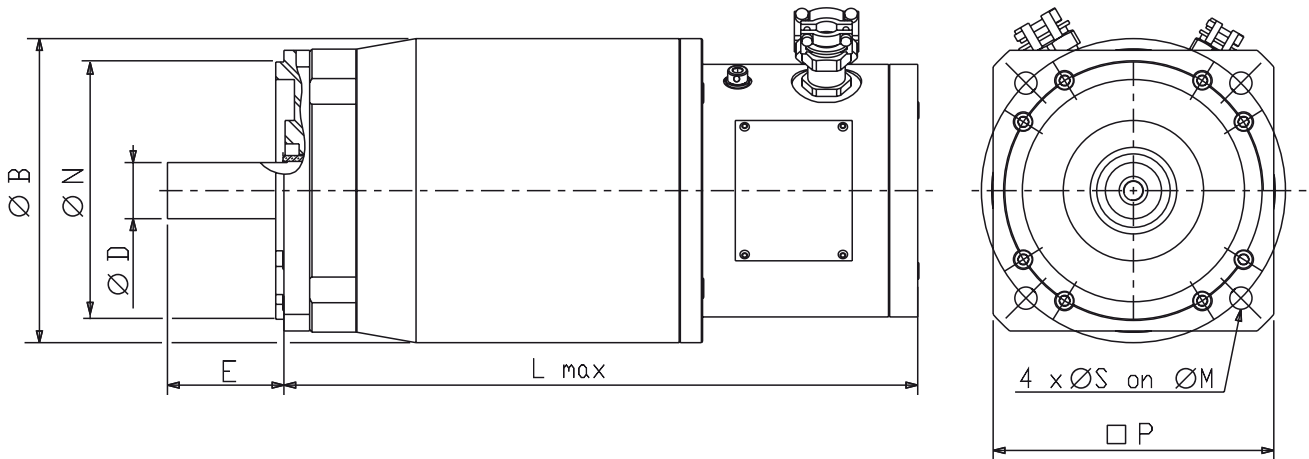
EX3 dimensions [mm]		
Motor	L	
	Without brake	With brake
EX310	225	255

EX4



EX4 dimensions [mm]		
Motor	L	
	Without brake	With brake
EX420	265	290
EX430	290	315

EX6 and EX8



EX6-EX8		dimensions [mm]							
Motor	N	D	E	B	P	S	M	L	
								Without brake	With brake
EX620	110	24	50	130	120	8.4	130	275	290
EX630	110	24	50	130	120	8.4	130	300	325
EX820	130	32	58	165	155	12	165	290	325
EX840	130	32	58	165	155	12	165	350	385
EX860	130	32	58	165	155	12	165	410	445

Order Code

EX Motors - CE marked

	1	2	3	4	5	6
Order example	EX310E	A	PR1	2	0	1

1 Motor type	EX310E	see table EX Series CE Motors
	EX420E	"Technical data"
	EX430E	
	...	
2 Feedback sensor	A	2 pole resolver (Standard)
	K	Without feedback sensor (on request)
	R	Absolute singleturn HIPERFACE SKS36 Encoder (128 periods/rev)
	S	Absolute multiturn HIPERFACE SKM36 Encoder (128 periods/rev)
	T	Absolute singleturn HIPERFACE SRS50 encoder 1024 ppr (not available for EX3) (on request)
	U	Absolute multiturn HIPERFACE SRM50 encoder 1024 ppr (not available for EX3) (on request)
	V	Absolute singleturn EnDat ECN 1113 encoder (not available for EX3 and EX4)
	W	Absolute multiturn EnDat EQN 1125 encoder (not available for EX3 and EX4)
	Y	Without feedback sensor in combination with AC650S drive
3 Motor type	PR1	see table EX Series CE Motors
	KR1	"Technical data"
	JR1	
	...	
4 Brake	2	Motor without brake (standard) + thermal switch sensor
	5	Motor with brake + thermal switch sensor
5 Ingress protection level	0	IP64 (standard)
	1	IP65
6 Shaft end	0	Smooth shaft (standard)
	1	Keyed shaft

Motor power cable

	1	2	3	4	5	6	7	8
Order example	C	C3	U	Q1	D1	R	0	005

1 Type	C	Cable
	P	Extension cable
2 Drive type	C3	Compax3
	S2	638
	S5	SLVD
3 Characteristic	U	PUR jacket class 6, 100 °C max.
4 Power cable	Q1	For EX <15 Arms
	Q2	For EX <21 Arms
5 Motor connector	D1	for EX motor
6,7 Fixed field	R	
	0	
8 Cable length ⁽¹⁾	001	1 m
	...	
	050	50 m

Feedback cable

	1	2	3	4	5	6	7	8
Order example	C	C3	U	A1	D1	R	0	005

1 Type	C	Cable
	P	Extension cable
2 Drive type	C3	Compax 3
	S2	638
	S5	SLVD
3 Characteristic	U	PUR jacket class 6, 100 °C max.
4 Feedback cable	A1	Resolver
	V1	EnDat encoder
	R1	Hiperface encoder
5 Motor connector	D1	for EX motor
6,7 Fixed field	R	
	0	
8 Cable length ⁽¹⁾	001	1 m
	...	
	050	50 m

⁽¹⁾ The 3 last digits indicate cable length in meters ± 5 % max
 For non-standard length cable with length different from: 1/2/3/4/5/10/15/20/25/30/40/50m please contact us.
 Example CC3UQ1D1R0015: power cable, length = 15 m

EX Servo Motors - UL Approved for Explosive Atmospheres

Technical Data

Rated Speed N_{max} [min ⁻¹]	Stall Torque M_0 [Nm]	Stall Current I_0 [A _{RMS}]	Rated Torque M_N [Nm]	Rated Current I_N [A _{RMS}]	Peak Torque M_{max} [Nm]	Peak Current I_{max} [A _{RMS}]	Moment of Inertia J [kgmm ²]	Product Code					
230 VAC power supply													
4200	1.6	2.46	1.41	2.24	3.98	6.29	79	EX310U	■	UR1	■	1	■
4000	3.2	4.15	2.45	3.25	8	10.8	290	EX420U	■	IR1	■	1	■
3200	4.4	4.88	3.48	3.94	11	12.6	426	EX430U	■	GR1	■	1	■
2750	6.4	6.02	4.76	4.67	17.4	16.2	980	EX620U	■	MR1	■	1	■
2700	9.5	7.91	7.12	6.16	23.8	19.4	1470	EX630U	■	KR1	■	1	■
2300	12.9	9.1	10.1	7.21	30	22.8	3200	EX820U	■	QR1	■	1	■
1650	22.6	12	16.8	9	60	34.6	6200	EX840U	■	LR1	■	1	■
1500	31.4	13.9	22.3	10.01	90	43.5	9200	EX860U	■	JR1	■	1	■
480 VAC power supply													
7600	1.6	2.46	1.03	1.74	3.98	6.29	79	EX310U	■	UR1	■	1	■
7000	3.2	4.15	1.1	1.58	8	10.8	290	EX420U	■	IR1	■	1	■
5700	4.4	4.88	1.72	2.07	11	12.6	426	EX430U	■	GR1	■	1	■
5000	6.4	6.02	1.71	1.95	17.4	16.2	980	EX620U	■	MR1	■	1	■
4200	9.5	7.91	4.38	4.02	23.8	19.4	1470	EX630U	■	KR1	■	1	■
4000	12.9	9.1	5.77	4.27	30	22.8	3200	EX820U	■	QR1	■	1	■
3000	22.6	12	5.84	3.39	60	34.6	6200	EX840U	■	LR1	■	1	■
2500	31.4	13.9	8.31	4.01	90	43.5	9200	EX860U	■	JR1	■	1	■

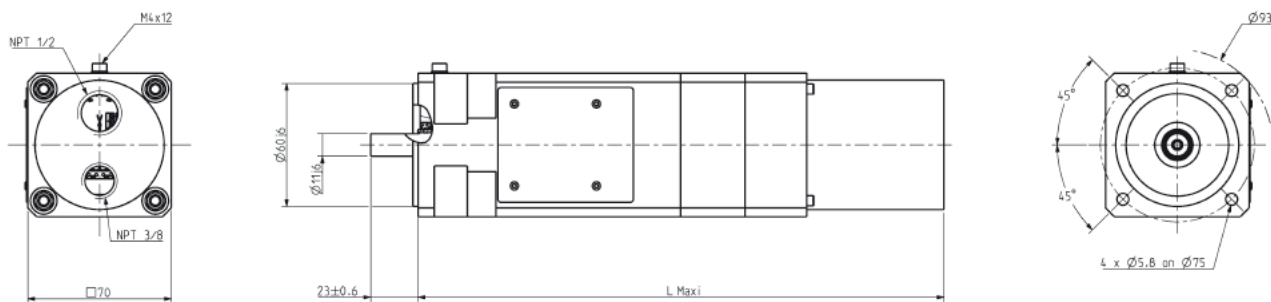
Motors
EX Series

Drive Associations

Motor	Rated Speed N_{max} [min ⁻¹]	Associated Drive Sizes	
		Compax3	SLVD-N
230 VAC power supply			
EX310U■UR1■1■	4200	C3S025V2...	SLVD2N...UL
EX420U■IR1■1■	4000	C3S063V2...	SLVD5N...UL
EX430U■GR1■1■	3200	C3S063V2...	SLVD5N...UL
EX620U■MR1■1■	2750	C3S063V2...	SLVD7N...UL
EX630U■KR1■1■	2700	C3S100V2...	SLVD10N...UL
EX820U■QR1■1■	2300	C3S100V2...	SLVD10N...UL
EX840U■LR1■1■	1650	C3S150V2...	SLVD15N...UL
EX860U■JR1■1■	1500	C3S150V2...	SLVD15N...UL
480 VAC power supply			
EX310U■UR1■1■	7600	C3S038V4...	-
EX420U■IR1■1■	7000	C3S075V4...	-
EX430U■GR1■1■	5700	C3S075V4...	-
EX620U■MR1■1■	5000	C3S075V4...	-
EX630U■KR1■1■	4200	C3S150V4...	-
EX820U■QR1■1■	4000	C3S150V4...	-
EX840U■LR1■1■	3000	C3S150V4...	-
EX860U■JR1■1■	2500	C3S150V4...	-

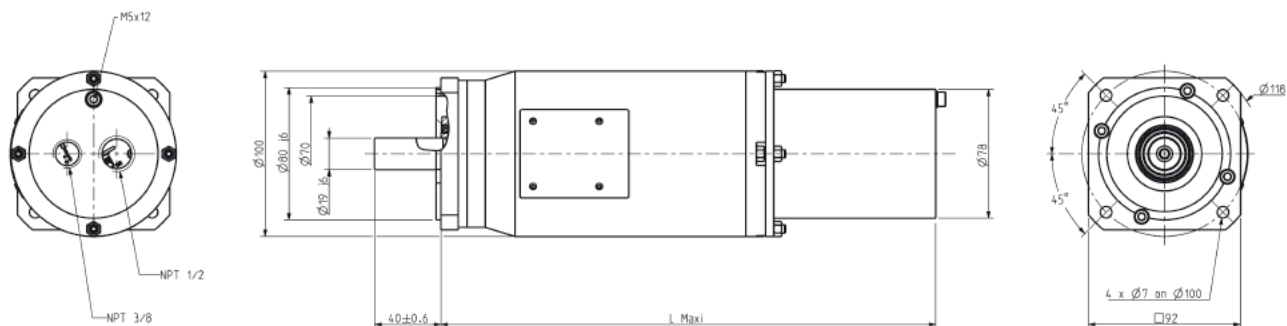
Dimensions (Resolver Version)

EX3



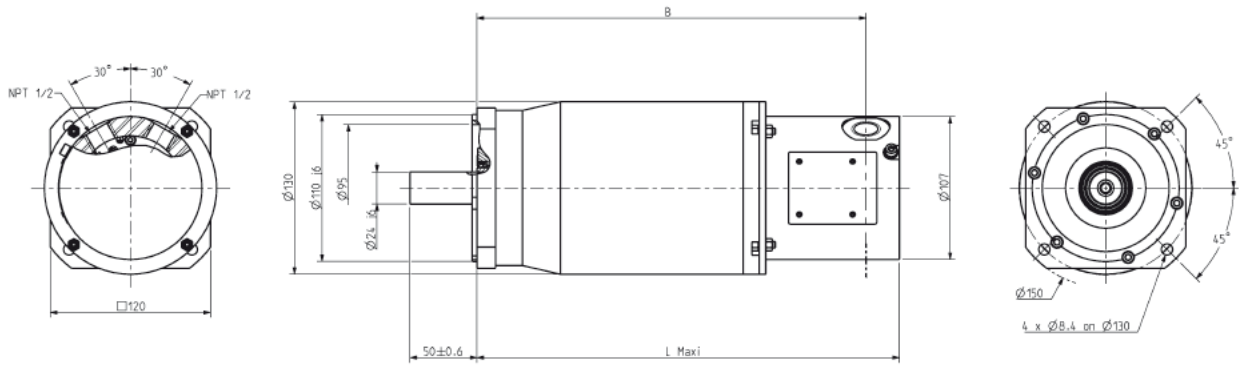
EX3 - UL dimensions [mm]		
Motor	L _{max}	
	Without brake	With brake
EX310	230	260

EX3



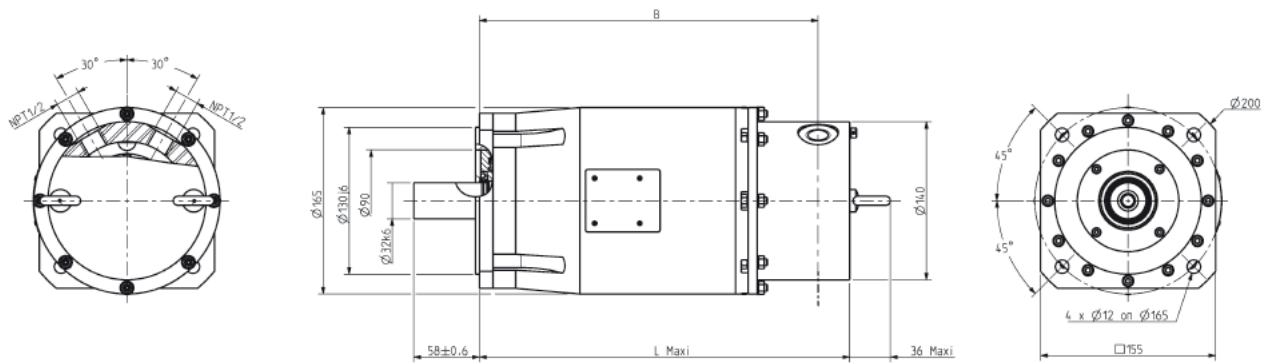
EX4 - UL dimensions [mm]		
Motor	L _{max}	
	Without brake	With brake
EX420	260	305
EX430	305	330

EX6



EX6 - UL dimensions [mm]				
Motor	L _{max}		B	
	Without brake	With brake	Without brake	With brake
EX620	290	320	262.5	291.5
EX630	320	435	291.5	316.5

EX8



EX8 - UL dimensions [mm]				
Motor	L _{max}		B	
	Without brake	With brake	Without brake	With brake
EX820	295	330	265	300
EX840	355	390	325	360
EX860	415	450	385	420

Order Code

EX Motors - UL marked

	1	2	3	4	5	6
Order example	EX310U	A	UR1	2	1	0

1 Motor type

EX310U see table EX Series UL servo motors
EX420U "Technical data"
EX430U

...

2 Feedback sensor

A 2 pole resolver (standard)
K Without feedback sensor (on request)
R Absolute singleturn HIPERFACE SKS36 Encoder (128 periods/rev)
S Absolute multiturn HIPERFACE SKM36 Encoder (128 periods/rev)
T Absolute singleturn HIPERFACE SRS50 encoder 1024 ppr (not available for EX3) (on request)
U Absolute multiturn HIPERFACE SRM50 encoder 1024 ppr (not available for EX3) (on request)
V Absolute singleturn EnDat ECN 1113 encoder (not available for EX3 and EX4)
W Absolute multiturn EnDat EQN 1125 encoder (not available for EX3 and EX4)
Y Without feedback sensor in combination with AC650S drive

3 Motor type

UR1 see table EX Series UL servo motors
IR1 "Technical data"
GR1

...

4 Brake

2 Motor without brake + thermal switch sensor (standard)
5 Motor with Brake + thermal switch sensor

5 Ingress protection level

1 IP65 (standard)

6 Shaft End

0 Smooth shaft (standard)
1 Keyed shaft

Feedback Sensors for CE and UL Motors

2 poles resolver - option A

- Accuracy: $\pm 10'$ max
- Transformation ratio: $0.5 \pm 5\%$
- Max. operating speed: $17\,000\text{ min}^{-1}$
- Working temperature range: $-55\dots+155\text{ }^\circ\text{C}$
- Compatibility: EX3 to EX8

Single turn / Multiturn absolute encoder HIPERFACE SKS/SKM 36 - option R/S

- Number of sine/cosine periods per revolution: 128
- Absolute position per revolution: 4096 (12 bits)
- Number of absolutely encodable revolutions: 4096 (SKM36)
- Max. operating speed SKS36: $12\,000\text{ min}^{-1}$
- Max. operating speed SKM36: $9\,000\text{ min}^{-1}$
- Working temperature range: $-20\dots+110\text{ }^\circ\text{C}$
- Compatibility: EX3 to EX8

Single turn / Multiturn absolute encoder EnDat ECN1113/EQN1125 - option V/W

- Number of sine/cosine periods per revolution: 512
- Absolute position per revolution: 8192 (13 bits)
- Number of absolutely encodable revolutions: 4096
- Accuracy: $\pm 60''$
- Absolute position value EnDat 2.2
- Max. operating speed: $12\,000\text{ min}^{-1}$
- Working temperature range: $-40\dots+115\text{ }^\circ\text{C}$
- Compatibility: EX6 to EX8

Single turn / Multiturn absolute encoder HIPERFACE SRS/SRM 50 - option T/U (on request)

- Number of sine/cosine periods per revolution: 1024
- Number of absolutely encodable revolutions: 4096 (SRM50)
- Absolute position per revolution: 32768 (15 bits)
- Working speed up to which the absolute position can be reliably determined: $6\,000\text{ min}^{-1}$
- Max. operating speed: $12\,000\text{ min}^{-1}$
- Working temperature range: $-20\dots+115\text{ }^\circ\text{C}$
- Compatibility: EX4 to EX8

Multiturn absolute encoder HIPERFACE SEL37 - option Q (on request)

- Number of sine/cosine periods per revolution: 16
- Number of absolutely encodable revolutions: 4096
- Working speed up to which the absolute position can be reliably determined: $6\,000\text{ min}^{-1}$
- Max. operating speed: $10\,000\text{ min}^{-1}$
- Working temperature range: $-20\dots+115\text{ }^\circ\text{C}$
- Compatibility: EX3 to EX8

High Speed Servo Motor - NV Series

Overview

Description

The NV series is a range of compact servomotors specially designed for high speed operation. NV motors are balanced with high accuracy to minimize the level of vibration and to increase their service life, making them particularly suitable for auxiliary spindle applications on machine tools. NV motors feature high dynamic performance and torque densities, while taking advantage of a large variety of options and customization possibilities. Available in kit version on request

Advantages

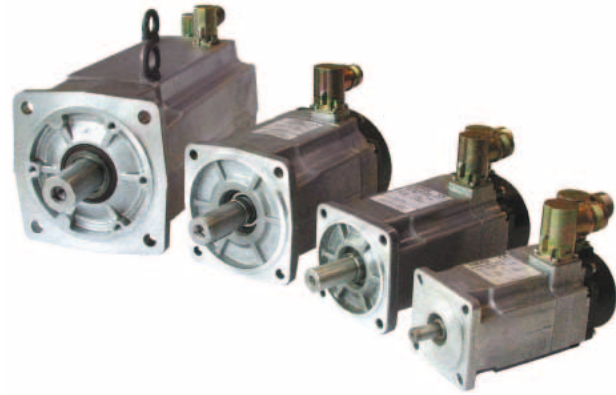
- High-Speed capabilities, precise and accurate positioning, high dynamic performance
- Compact and robust
- Design flexibility

Application

- Tooling Machines

Features

- **Mounting**
 - Flange with clearance holes
- **Mechanical interface**
 - Solid smooth shaft
- **Feedback sensor**
 - 2 pole resolver (standard)
 - Absolute encoders: EnDat, Hiperface, Posivex (options)
 - Without sensor (on request)
- **Connections**
 - Connectors
 - Terminal box (fan cooled motors)
- **Options**
 - Thermal protection (PTC, Thermo Switch or KTY)



Technical Characteristics - Overview

Motor type	Synchronous permanent magnet servomotors
Poles number	10
Voltage supply	230 VAC or 400 VAC
Power range	0.7...12 kW
Torque range	0.4...11.5 Nm
Speed range	7000...17 000 min ⁻¹
Ingress protection level (IEC60034-5)	<ul style="list-style-type: none"> • IP64 (standard) • IP65 (option)
Cooling method	<ul style="list-style-type: none"> • Natural ventilation (standard) • Fan cooling (NV860V)
Temperature class (IEC60034-1)	Class F

Technical Data

Rated Speed N_N [min ⁻¹]	Stall Torque $M_0^{(1)}$ [Nm]	Rated Torque M_N [Nm]	Stall Current ⁽¹⁾ I_0 [A _{RMS}]	Rated Current I_N [A _{RMS}]	Rated power P_N [kW]	Moment of Inertia J [kgmm ²]	Product Code							
230 VAC supply voltage - single or three-phased														
17000	0.9	0.41	5.13	2.78	0.7	73.4	NV310E	■	W	■	■	■	■	0
400 VAC supply voltage - three-phased														
14000	1.9	0.95	5.25	2.87	1.39	290	NV420E	■	I	■	■	■	■	0
11000	2.5	1.3	5.63	3.48	1.5	426	NV430E	■	H	■	■	■	■	0
11000	3.5	1.6	9.86	5.02	1.8	900	NV620E	■	J	■	■	■	■	0
10000	5.5	1.9	11.1	4.34	2	1300	NV630E	■	I	■	■	■	■	0
9000	7.6	3.35	14.7	7.73	3.2	3100	NV820E	■	N	■	■	■	■	0
8000	13.5	6.6	19.4	10.51	5.5	5700	NV840E	■	J	■	■	■	■	0
7000	18.5	9.9	28.3	16.33	7.3	8400	NV860E	■	E	■	■	■	■	0
9000	30	11.5	57	23.75	10.8	8400	NV860V	■	C	■	■	■	■	0

Associated Drives

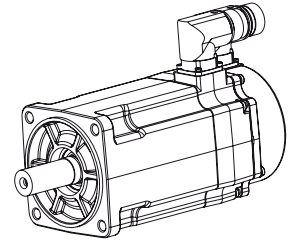
Motor	Rated Speed N_N [min ⁻¹]	Stall Current ⁽¹⁾ I_0 [A _{RMS}]	Rated Current I_N [A _{RMS}]	Drives sizes (DRIVE > I0)			
				Compax3		SLVD-N	
				Compax3	Max. Speed [min ⁻¹]	SLVD-N	Max. Speed [min ⁻¹]
230 VAC supply voltage - single or three-phased							
NV310EAWR7000	17000	5.13	2.78	C3S100V2...	12000	-	-
400 VAC supply voltage - three-phased							
NV420EAIR7000	14000	5.25	2.87	C3S075V4...	12000	-	-
NV430EAHR7000	11000	5.63	3.48	C3S075V4...	11000	-	-
NV620EAJR7000	11000	9.86	5.02	C3S150V4...	11000	-	-
NV630EAIR7000	10000	11.1	4.34	C3S150V4...	10000	-	-
NV820EANR7000	9000	14.7	7.73	C3S150V4...	9000	-	-
NV840EAJR7000	8000	19.4	10.51	C3S300V4...	7330	-	-
NV860EAER7000	7000	28.3	16.33	C3S300V4...	7000	-	-
NV860VACR8000	9000	57	23.75	C3H090V4...	9000	-	-

⁽¹⁾ Mounting on aluminium flange: 400 x 400 x 12 mm (NV3-8)
 Temperature <40 °C near motor's flange

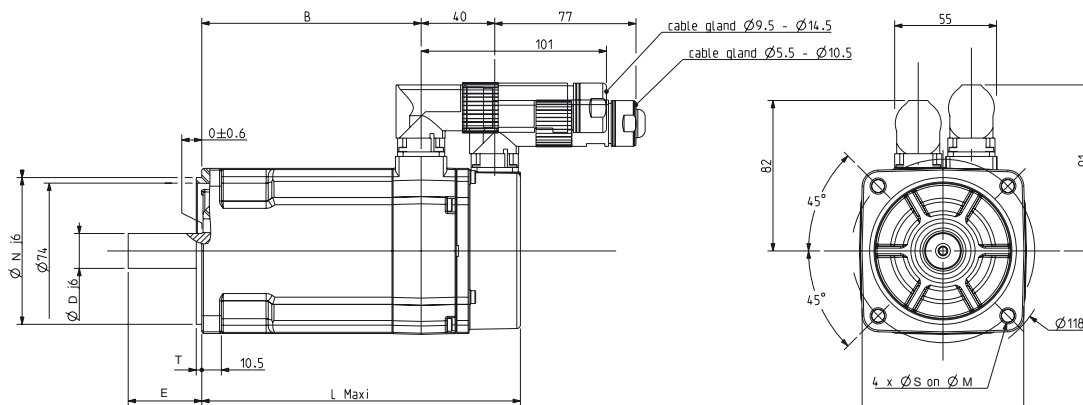
Dimensions

Resolver Version

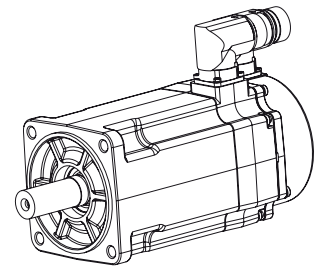
NV3, NV4, NV6											
Motor	N [mm]	M [mm]	D [mm]	E [mm]	T [mm]	P [mm]	S [mm]	Weight [kg]	L [mm]	Fr ⁽¹⁾ [daN]	Fa ⁽¹⁾ [daN]
NV310	60	75-80	11	23	2.5	71	5.5	2	147	36	20
NV420	80	100	19	40	3	91.5	7	3.7	175	72	24
NV430	80	100	19	40	3	91.5	7	4.6	200	82	24
NV620	110	130	24	50	3.5	121	9	6.9	181	82	52
NV630	110	130	24	50	3.5	121	9	8.8	210	86	54



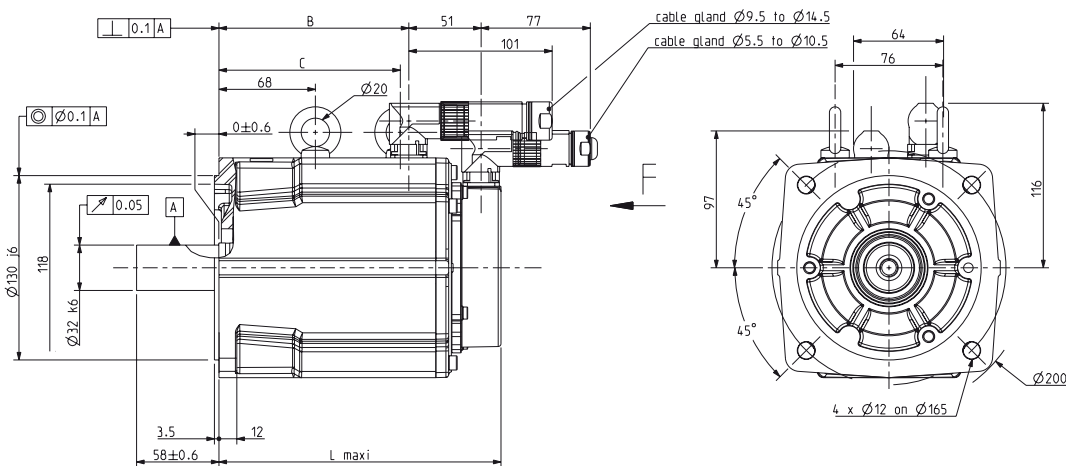
⁽¹⁾ Fr and Fa not cumulative: At 1500 min⁻¹ for a bearing service life of 20 000 hours



NV8				
Motor	Weight [kg]	L [mm]	Fr ⁽¹⁾ [daN]	Fa ⁽¹⁾ [daN]
NV820	13	200	151	28
NV840	20	260	165	33
NV860	27	320	172	37



⁽¹⁾ Fr and Fa not cumulative: At 1500 min⁻¹ for a bearing service life of 20 000 hours



Options

Feedback Sensors

2 poles resolver - option A

- Accuracy: $\pm 10'$ max
- Transformation ratio: $0.5 \pm 5\%$
- Max. operating speed: $17\,000\text{ min}^{-1}$
- Working temperature range: $-55\dots+155\text{ }^\circ\text{C}$
- Compatibility: NV3 to NV8

Single turn / Multiturn absolute encoder HIPERFACE SKS/SKM 36 - option R/S

- Number of sine/cosine periods per revolution: 128
- Absolute position per revolution: 4096 (12 bits)
- Number of absolutely encodable revolutions: 4096 (SKM36)
- Max. operating speed SKS36: $12\,000\text{ min}^{-1}$
- Max. operating speed SKM36: $9\,000\text{ min}^{-1}$
- Working temperature range: $-20\dots+110\text{ }^\circ\text{C}$
- Compatibility: NV3 to NV8

Single turn / Multiturn absolute encoder EnDat ECN1113/EQN1125 - option V/W

- Number of sine/cosine periods per revolution: 512
- Absolute position per revolution: 8192 (13 bits)
- Number of absolutely encodable revolutions: 4096
- Accuracy: $\pm 60''$
- Absolute position value EnDat 2.2
- Max. operating speed: $12\,000\text{ min}^{-1}$
- Working temperature range: $-40\dots+115\text{ }^\circ\text{C}$
- Compatibility: NV3 to NV8

Single turn / Multiturn absolute encoder HIPERFACE SRS/SRM 50 - option T/U (on request)

- Number of sine/cosine periods per revolution: 1024
- Number of absolutely encodable revolutions: 4096 (SRM50)
- Absolute position per revolution: 32768 (15 bits)
- Working speed up to which the absolute position can be reliably determined: $6\,000\text{ min}^{-1}$
- Max. operating speed: $12\,000\text{ min}^{-1}$
- Working temperature range: $-20\dots+115\text{ }^\circ\text{C}$
- Compatibility: NV3 to NV8

Order Code

NV Series

	1	2	3	4	5	6	7
Order example	NV310E	A	R	7	0	0	0

1 Motor type

NV310E
NV420E
NV430E see table "Technical Data"
 ...
NV860V

2 Feedback sensor

A 2 pole resolver (standard)
 Max. speed 17 000 min⁻¹

R HIPERFACE encoder 128 ppr SKS36
 Max. speed 12 000 min⁻¹

S Absolute multi-turn HIPERFACE
 encoder 128 ppr SKM36
 Max. speed 9000 min⁻¹

T Absolute single-turn HIPERFACE
 encoder 1024 ppt SRS50
 Max. speed 12 000 min⁻¹
 (on request)

U Absolute multi-turn HIPERFACE
 encoder 1024 ppt SRM50
 Max. speed 12 000 min⁻¹
 (on request)

V Absolute single-turn EnDat encoder
 ECN 1113
 Max. speed 12 000 min⁻¹

W Absolute multi-turn EnDat encoder
 EQN 1125
 Max. speed 12 000 min⁻¹

3 Painting

R Unpainted (standard)

B Black mat (on request)

4 Connections / Ventilation

1 Shielded cables / No

7 Connectors (standard) / No

9 Terminal boxes / Yes

5 Thermal protection

0 Without protection (standard)

1 PTC on power connector

2 Thermo switch on power connector

A PTC on sensor connector

B Thermo switch on sensor connector

C KTY on sensor connector

6 Protection degree

0 IP64 (standard)

1 IP65

7 Fix code

0

Motor Power Cable

	1	2	3	4	5	6	7	8
Code example	C	C3	U	P1	F1	R	0	005

1 Type	C	Cable
	P	Extension cable
2 Drive type	C3	Compax3
	D1	Digivex
	S2	638
	S4	AC890
	S5	SLVD
3 Characteristic	U	PUR jacket class 6 (standard)
4 Power cable	P1	For NV <15 A _{rms}
	P2	For NV <21 A _{rms}
5 Motor connector	F1	For NV3-NV8 motors
	R	Fixed
7 Fixed field	0	
8 Cable length *	001	1 m
	...	
	050	50 m

Feedback Cable

	1	2	3	4	5	6	7	8
Code example	C	C3	U	A1	F1	R	0	005

1 Type	C	Cable
	P	Extension cable
2 Drive type	C3	Compax3
	D1	Digivex
	S2	638
	S4	AC890
	S5	SLVD
3 Characteristic	U	PUR jacket class 6 (standard)
4 Feedback cable	A1	Resolver
	V1	EnDat encoder
	R1	Hiperface encoder
5 Motor connector	F1	For motor with resolver or Hiperface
	F3	For motor with EnDat
6 Section	R	Fixed
7 Fixed field	0	
8 Cable length *	001	1 m
	...	
	050	50 m

(*) The 3 last digits indicate cable length in meters ±5 % max
For non-standard length cable with length different from: 1/2/3/4/5/10/15/20/25/30/40/50m please contact us.
Example CC3UP1F1R0015: power cable, length = 15 m.



Frameless Servo Motor - NK Series

Overview

Description

Servo motor kit is an innovative and comprehensive approach enabling the complete integration of the motor in a simplified mechanical system. This approach ensures that the size constraints of the machine are utilized to maximum effect. This delivers a more accurate, reliable and robust solution than traditional construction methods. A complete range of products is available to meet the design needs of many different mechanical systems in a host of different applications. Other more bespoke adaptations can be developed upon request.

Advantages

- Compact footprint and reduced weight of the mechanical systems
- Reduced cost
- Direct Drive: accurate and robust mechanics
- Complete and optimized solution including sensor, cooling system and drive
- Integration assistance

Applications

- Tooling Machines
- Medical Science



Technical Characteristics - Overview

Frameless servomotors	
Low speed torque	0.4...42 Nm
Max. speed	8000 min ⁻¹
Max. constant power	0.25...7.7 kW
Inertia	13...9200 kgmm ²
Weight	0.422...17.445 kg
Frameless servomotors with water cooling	
Low speed torque	3.4...72 Nm
Max. speed	15000 min ⁻¹
Max. constant power	4.7...30 kW
Inertia	79...9200 kgmm ²
Weight	0.8885...17.44 kg

Technical Data

Stall Torque $M_0^{(1)}$ [Nm]	Rated Torque M_N [Nm]	Max. Speed N_{may} [min ⁻¹]	Low Speed Current I_0 [A _{RMS}]	Nominal Current I_N [A _{RMS}]	Moment of Inertia J [kgmm ²]	Product Code							
230 VAC power supply - single or three-phased													
0.45	0.33	6000	0.99	0.78	13	NK110E	■	P	R	1	■	0	0
1.00	0.80	4000	1.34	1.11	38	NK210E	■	T	R	1	■	0	0
1.00	0.61	6000	1.99	1.32	38	NK210E	■	P	R	1	■	0	0
2.00	1.80	2300	1.39	1.27	79	NK310E	■	P	R	1	■	0	0
2.00	1.65	4000	2.43	2.06	79	NK310E	■	K	R	1	■	0	0
4.00	3.53	2300	2.71	2.41	290	NK420E	■	P	R	1	■	0	0
4.00	3.14	4000	4.69	3.74	290	NK420E	■	J	R	1	■	0	0
5.50	4.68	3200	5.24	4.53	426	NK430E	■	J	R	1	■	0	0
5.50	4.29	4000	6.64	5.28	426	NK430E	■	F	R	1	■	0	0
8.00	7.42	2200	5.31	4.99	980	NK620E	■	R	R	1	■	0	0
8.00	6.08	4000	9.89	7.82	980	NK620E	■	J	R	1	■	0	0
12.00	10.73	1450	5.25	4.75	1470	NK630E	■	R	R	1	■	0	0
12.00	9.21	2800	9.86	7.80	1470	NK630E	■	K	R	1	■	0	0
12.00	7.60	4000	13.90	9.31	1470	NK630E	■	G	R	1	■	0	0
16.00	13.24	3600	17.50	14.82	3200	NK820E	■	L	R	1	■	0	0
28.00	22.88	2200	18.90	15.70	6200	NK840E	■	J	R	1	■	0	0
41.00	32.80	1900	27.00	22.00	9200	NK860E	■	F	R	1	■	0	0
41.00	27.47	2600	33.00	22.72	9200	NK860E	■	D	R	1	■	0	0
400 VAC power supply - three-phased													
1.00	0.61	6000	1.34	0.89	38	NK210E	■	T	R	1	■	0	0
2.00	1.65	4000	1.39	1.18	79	NK310E	■	P	R	1	■	0	0
4.00	3.60	2000	1.36	1.23	290	NK420E	■	V	R	1	■	0	0
4.00	3.14	4000	2.71	2.16	290	NK420E	■	P	R	1	■	0	0
5.50	5.38	1000	1.41	1.38	426	NK430E	■	V	R	1	■	0	0
5.50	4.77	3000	2.82	2.48	426	NK430E	■	P	R	1	■	0	0
5.50	4.29	4000	3.78	3.01	426	NK430E	■	L	R	1	■	0	0
8.00	7.52	2000	2.83	2.69	980	NK620E	■	V	R	1	■	0	0
8.00	6.17	3900	5.31	4.25	980	NK620E	■	R	R	1	■	0	0
8.00	4.10	4500	9.89	5.56	980	NK620E	■	J	R	1	■	0	0
12.00	10.83	1350	2.62	2.40	1470	NK630E	■	V	R	1	■	0	0
12.00	9.34	2700	5.25	4.20	1470	NK630E	■	R	R	1	■	0	0
12.00	7.60	4000	7.92	5.30	1470	NK630E	■	N	R	1	■	0	0
16.00	14.72	1900	5.16	4.79	3200	NK820E	■	K	R	1	■	0	0
16.00	12.94	3900	11.00	9.07	3200	NK820E	■	R	R	1	■	0	0
28.00	23.17	2100	10.10	8.47	6200	NK840E	■	Q	R	1	■	0	0
28.00	18.56	3500	16.80	11.51	6200	NK840E	■	K	R	1	■	0	0
41.00	27.47	2600	18.50	12.78	9200	NK860E	■	J	R	1	■	0	0

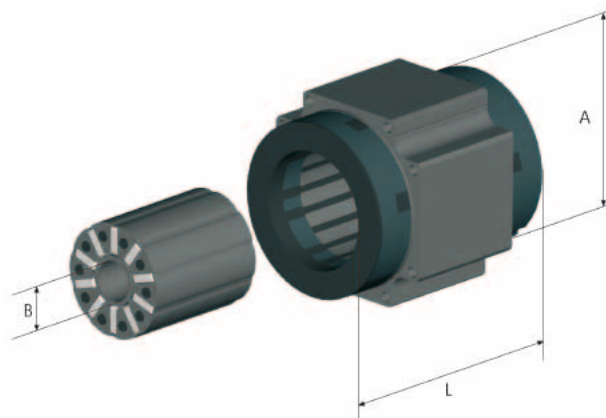
⁽¹⁾ Mounting on aluminium flange: 280 x 280 x 8 mm (NK1-2), 400 x 400 x 12 mm (NK3-8)
 (For frameless servomotors with water cooling, please contact us)

Associated Drives

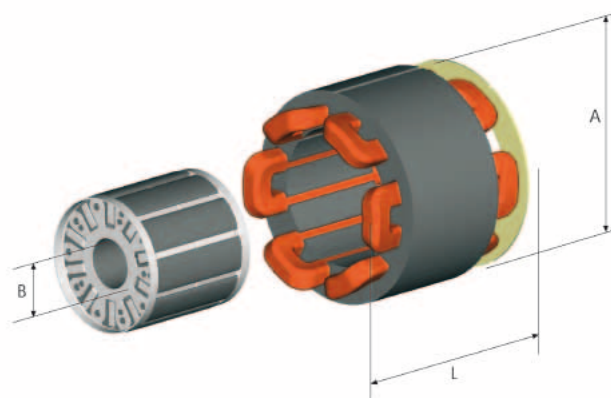
Standards Motors Ref.	Max. Speed [min ⁻¹]			Drives sizes		
	638	Compax3	SLVD-N	Compax3	SLVD-N	638
230 VAC power supply - single or three-phased						
NK110E..P.	6000	6000	5400	C3S025V2..	SLVD1N	638A-01-3-F...
NK210E..T.	4000	3420	3420	C3S025V2..	SLVD2N	638A-02-3-F..
NK210E..P.	6000	5530	5400	C3S025V2..	SLVD2N	638A-02-3-F..
NK310E..P.	2300	1930	1930	C3S025V2..	SLVD2N	638A-02-3-F..
NK310E..K.	4000	3600	3600	C3S025V2..	SLVD2N	638A-04-3-F..
NK420E..P.	2300	1990	1990	C3S063V2..	SLVD5N	638A-04-3-F..
NK420E..J.	4000	3620	3620	C3S063V2..	SLVD5N	638A-04-3-F..
NK430E..J.	3200	2860	2860	C3S063V2..	SLVD7N	638A-06-3-F..
NK430E..F.	4000	3700	3700	C3S100V2..	SLVD7N	-
NK620E..R.	2200	1880	1880	C3S063V2..	SLVD7N	638A-06-3-F..
NK620E..J.	4000	3670	3670	C3S100V2..	SLVD10N	-
NK630E..R.	1450	1320	1320	C3S063V2..	SLVD7N	638A-06-3-F..
NK630E..K.	2800	2600	2600	C3S100V2..	SLVD10N	-
NK630E..G.	4000	3750	3750	C3S150V2..	SLVD15N	-
NK820E..L.	3600	3310	-	-	-	-
NK840E..J.	2200	2070	-	-	-	-
NK860E..F.	1900	1900	-	-	-	-
NK860E..D.	2600	2510	-	-	-	-
400 VAC power supply - three-phased						
NK210E..T.	6000	6000	-	C3S015V4..	-	
NK310E..P.	4000	3570	-	C3S015V4..	-	
NK420E..V.	2000	1710	-	C3S015V4..	-	
NK420E..P.	4000	3630	-	C3S038V4..	-	
NK430E..V.	1000	1000	-	C3S015V4..	-	
NK430E..P.	3000	2670	-	C3S038V4..	-	
NK430E..L.	4000	3650	-	C3S038V4..	-	
NK620E..V.	2000	1730	-	C3S038V4..	-	
NK620E..R.	3900	3440	-	C3S075V4..	-	
NK620E..J.	4500	4500	-	C3S150V4..	-	
NK630E..V.	1350	1150	-	C3S038V4..	-	
NK630E..R.	2700	2390	-	C3S075V4..	-	
NK630E..N.	4000	3710	-	C3S150V4..	-	
NK820E..K.	1900	1620	-	C3S075V4..	-	
NK820E..R.	3900	3600	-	C3S150V4..	-	
NK840E..Q.	2100	1910	-	C3S150V4..	-	
NK840E..K.	3500	3270	-	C3S300V4..	-	
NK860E..J.	2600	2440	-	C3S300V4..	-	

Dimensions

Motor	A [mm]	B [mm]	L [mm]
NK110	42	9	65
NK2■■■	56	12	68



Motor	A [mm]	B [mm]	L [mm]
NK310	62	14	75
NK420	80	20	92
NK430			117
NK620	111	26	104
NK630			133
NK820	143	40	110
NK840			170
NK860			230
NK310W	82	14	85
NK420W	100	20	102
NK430W			127
NK620W	131	26	114
NK630W			143
NK820W	143	40	120
NK840W			180
NK860W			240



Option

Several types of sensor are available for use with servo motor kits depending upon the needs of the application, such as environment, resolution and accuracy: resolver, high resolution sensor, optical encoder...

Order Code

NK Series

	1	2	3	4	5	6
Order example	NK110	E	A	KR1	0	00

1	Motor type
	NK110
	NK210
	NK310
	see table "Technical Data"
	...
2	Cooling
	E Natural cooling
	W Water cooling
3	Feedback sensors/Motors
	A 2 pole resolver
	K Without sensor (standard)
	Q Absolute multi-turn HIPERFACE 16ppr SEL37 (on request)
	R Absolute single-turn HIPERFACE encoder 128 ppt SKS36/NK2-8
	S Absolute multi-turn HIPERFACE encoder 128 ppt SKM36/NK2-8
	T Absolute single-turn HIPERFACE encoder 1024 ppt SRS50/NK3-8 (on request)
	U Absolute multi-turn HIPERFACE encoder 1024 ppt SRM50/NK3-8 (on request)
	V Absolute single-turn EnDat encoder ECN 1113/NK2-8
	W Absolute multi-turn EnDat encoder EQN 1125/NK2-8
	Y Without feedback sensor in combination with AC650S drive

4	Motor type
	PR1
	TR1
	JR1
	see table "Technical Data"
	...
5	Thermal protection + Brake/Motors
	0 Without (standard)
	1 PTC/NK3-8
	2 Thermo switch/NK3-8
6	Mechanical characteristics/Motors
	00 Standard
	XX Customization (on request)

Frameless Spindle Servo Motor - SKW Series

Overview

Description

SK motors are compact and highly dynamic permanent magnet synchronous servomotors for spindle applications up to 20 kW. Delivered as separate components to be integrated into the mechanical structure of the machine, SK motors offer constant torque capabilities over a wide speed range.



Features

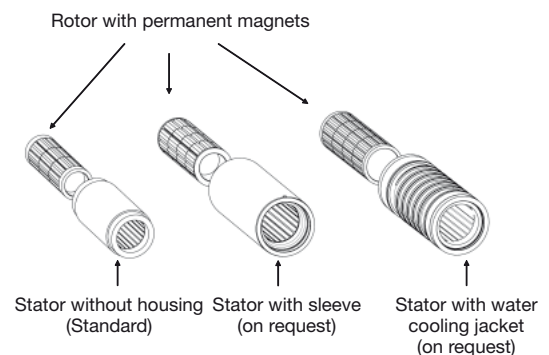
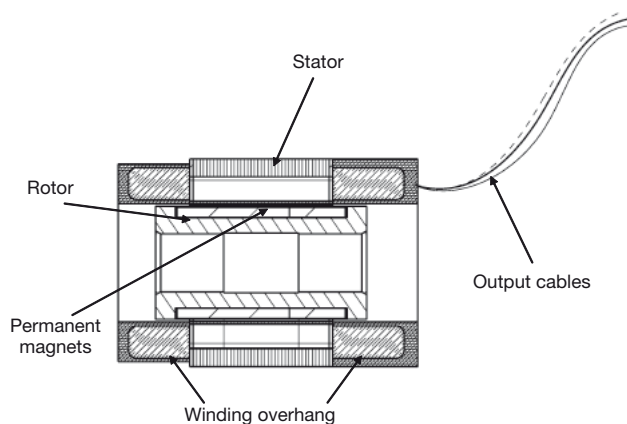
- **Parker SK Series Kit Spindle Motors include**
 - a rotor with permanent magnets which can, on request, be mounted on customer's shaft
 - a wound stator which can, on request, be designed with a cooling jacket or integrated into customer's mechanics
- **Kit solution leading to simplified mechanical designs**
- **High dynamic performance and power density: increased productivity and to reduced size compared to induction motors**
- **Cold permanent magnet technology: reduced heating in the bearings compared to induction motors, no dilatation effect**
- **Increased internal diameter compared to other solutions: increased rigidity and greater capacity for bar stock handling in automatic lathes**
- **Compatibility with cost effective sensorless drives from Parker**

Applications

- Tooling Machines

Technical Characteristics - Overview

Motor Type	Permanent magnet synchronous motors
Power supply	3 ph - 400 VAC
Power range	up to 20 kW
Speed range	<ul style="list-style-type: none"> • up to 12 000 min⁻¹ • higher speeds on request
Insulation (CEI 60034-1)	Class F
Cooling	<ul style="list-style-type: none"> • Water cooling (standard) • Natural convection on request
Connections	2 m flying cables without connectors
Construction type	Individual components (rotor, stator, feedback sensor)



Technical Data

Electric characteristics - water cooled motors

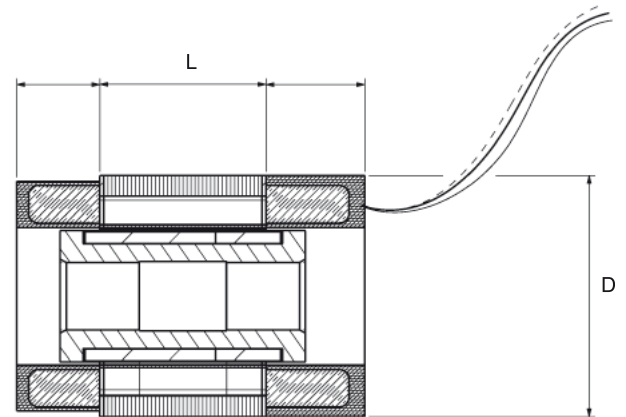
Nominal Power P_N [kW]	Nominal Torque T_N [Nm]	Nominal Speed V_N [min ⁻¹]	Number of Poles	Torque at low speed T_0 [Nm]	Peak Torque T_{PEAK} [Nm]	Nominal Current I_N [A _{RMS}]	Current at low speed I_0 [A _{RMS}]	Product Code		
2.85	2.27	12000	10	2.9	7	6.27	7.48	SKW073	■	037LALR0001
6.8	5.41	12000		6.8	14	13.9	16.5	SKW073	■	075LAER0001
10.2	9.26	10500		11	21	20.9	23.7	SKW073	■	112LAHR0001
13.5	13.5	9500		15.5	28	27.3	30.1	SKW073	■	150LAER0001
2.15	1.71	12000	10	2.3	6.5	4.37	5.53	SKW082	■	033LBPR0001
3.9	3.1	12000		4.5	12	8.18	11	SKW082	■	045LAHR0001
5.2	4.14	12000		5.5	13	10.4	13.2	SKW082	■	065LBGR0001
7.55	6.01	12000		9	19.5	14.5	20.6	SKW082	■	098LBIR0001
8.94	8.13	10500		10.6	24	17.5	21.6	SKW082	■	091LAHR0001
11.5	9.96	11000		12.5	26	22.6	27.3	SKW082	■	130LBDR0001
12.3	14.6	8000		17	36	24.2	27.3	SKW082	■	137LADR0001
5.5	4.38	12000		10	6.1	24	11.7	15.2	SKW091	■
12.9	10.7	11500	14.4		48	25.7	32.6	SKW091	■	091LACR0001
18.1	19.2	9000	23		72	35.9	41.5	SKW091	■	137LAAR0001
3.15	2.5	12000	3.1		12	6.15	7.13	SKW091	■	033LBPR0001
7.7	6.13	12000	7.6		24	15.6	18.3	SKW091	■	065LBGR0001
12.6	10	12000	12.4		36	24.1	28.5	SKW091	■	098LBER0001
17.5	13.9	12000	17.3		48	35.2	41.8	SKW091	■	130LBAR0001
3.6	4.3	8000	14		5.4	25	7.38	8.66	SKW096	■
8.4	10	8000		12.5	50	17	20	SKW096	■	090MAJR0001
12.3	16.7	7000		20	75	23.4	26.7	SKW096	■	135MAGR0001
15.4	24.4	6000		28	100	30.2	33.4	SKW096	■	180MAER0001

Associated Drives

Product Code	Nominal Power P_N [kW]	Nominal Speed V_N [min ⁻¹]	Number of Poles	Drive Reference	
				AC650S [max. speed 6000 min ⁻¹]	AC890
SKW073_037LALR0001	2.85	12000	10	650S-43190030	890SD-532120B0...
SKW073_075LAER0001	6.8	12000		-	890SD-532240B0...
SKW073_112LAHR0001	10.2	10500		-	890SD-532300C0...
SKW073_150LAER0001	13.5	9500		-	890SD-53230SC0...
SKW082_033LBPR0001	2.15	12000	10	650S-43190030	890SD-532100B0...
SKW082_045LAHR0001	3.9	12000		650S-43216030	890SD-532160B0...
SKW082_065LBGR0001	5.2	12000		650S-43216030	890SD-53216SB0...
SKW082_098LBIR0001	7.55	12000		-	890SD-532240C0...
SKW082_091LAHR0001	8.94	10500		-	890SD-532300C0...
SKW082_130LBDR0001	11.5	11000		-	890SD-53230SC0...
SKW082_137LADR0001	12.3	8000		-	890SD-53230SC0...
SKW091_045LAHR0001	5.5	12000		10	650S-43216030
SKW091_091LACR0001	12.9	11500	-		890SD-532390D0...
SKW091_137LAAR0001	18.1	9000	-		890SD-532590D0...
SKW091_033LBPR0001	3.15	12000	650S-43190030		890SD-532120B0...
SKW091_065LBGR0001	7.7	12000	-		890SD-532240C0...
SKW091_098LBER0001	12.6	12000	-		890SD-53230SC0...
SKW091_130LBAR0001	17.5	12000	-		890SD-532590D0...
SKW096_045MAJR0001	3.6	8000	14		-
SKW096_090MAJR0001	8.4	8000		-	890SD-532240C0...
SKW096_135MAGR0001	12.3	7000		-	890SD-53230SC0...
SKW096_180MAER0001	15.4	6000		-	890SD-532390D0...

Dimensions

Product Code	D [mm]	L [mm]
SKW073_037LALR0001	73	37
SKW073_075LAER0001	73	75
SKW073_112LAHR0001	73	112
SKW073_150LAER0001	73	150
SKW082_033LBPR0001	82	33
SKW082_045LAHR0001	82	45
SKW082_065LBGR0001	82	65
SKW082_098LBIR0001	82	98
SKW082_091LAHR0001	82	91
SKW082_130LBDR0001	82	130
SKW082_137LADR0001	82	137
SKW091_045LAHR0001	91	45
SKW091_091LACR0001	91	91
SKW091_137LAAR0001	91	137
SKW091_033LBPR0001	91	33
SKW091_065LBGR0001	91	65
SKW091_098LBER0001	91	98
SKW091_130LBAR0001	91	130
SKW096_045MAJR0001	96	45
SKW096_090MAJR0001	96	90
SKW096_135MAGR0001	96	135
SKW096_180MAER0001	96	180



Order Code

SKW Series

	1	2	3	4	5	6	7
Order example	SK	W	082	S	37	LALR	0000

1 Motor type

SK Frameless permanent magnet servomotors

2 Cooling

W Water cooling (standard)
A Natural ventilation (available with derating, consult us)

3 External diameter

061 61 mm
073 73 mm
082 82 mm
091 91 mm
096 96 mm
103 103 mm

4 Element

- Motor (stator + rotor)
S Stator
R Rotor

5 Length L [mm]

37
75 see table "Dimensions"
112
...

6 Torque/Speed characteristics

LALR
LAER see table "Technical Data"
LAHR
...

7 Interface

0000 Standard motor

Frameless AC Brushless Motor - HKW Series

Overview

Description

HKW motors are high performance permanent magnet synchronous servomotors for spindle applications up to 230 kW.

Delivered as separate components to be integrated into the mechanical structure of the machine, HKW motors benefit from the use of field weakening, in order to achieve both high torque at slow speed, and very high maximum speed at constant power.

Applications

- Tooling Machines

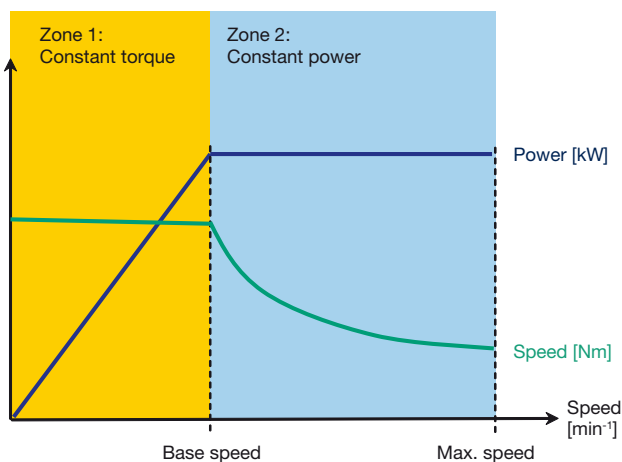
Features

- Kit solution leading to simplified mechanical design
- Very high speed capabilities - up to 50 000 min⁻¹
- Constant power operation up to 10 x base speed: no oversizing of the drive
- High dynamic performance and power density: increased productivity and reduced size compared to induction motors
- Cold permanent magnet technology: reduced heating in the bearings compared to induction motors, no dilatation effect
- Compatibility with third-party drives
 - Siemens
 - Fanuc



Technical Characteristics - Overview

Motor type	Permanent magnet synchronous motors
Type of construction	Individual components: rotor, stator and feedback sensor
Power supply	3 ph - 400 VAC
Power range	up to 230 kW
Speed range	up to 50 000 min ⁻¹
Insulation of stator winding according to CEI 60034-1	Class F
Ambient temperature	40 °C maxi
Altitude	< 1000 m
Cooling	<ul style="list-style-type: none"> • Water cooling (standard) • Natural convection on request
Stator design variants	<ul style="list-style-type: none"> • Stator without housing (standard) • Stator housing on request, with or without water cooling circuit
Rotor design variants	<ul style="list-style-type: none"> • Rotor without hub (standard) • Rotor with hub on request
Connections	2 m flying cables without connectors



Technical Data

540 VDC voltage supply										
Motor	S1/S6 Power PS1 [kW]	Low speed torque M _o [Nm]	Low speed S6 torque M _{oS6} [Nm]	Base speed Nb [min ⁻¹]	Max speed N [min ⁻¹]	Permanent current at low speed I _o [A _{rms}]	S6 current at low speed I _{oS6} [A _{rms}]	Rotor inertia J [kgmm ²]	Thermal time constant Tth [min]	
HKW085_066BAU	2.3	4.9	7.3	4480	50000	6.8	13.5	490	1	
HKW085_066BAP	4.9	4.5		10400		12.2	27.0	490		
HKW085_066BAK	10.2	4.2		23200		22.4	54.0	490		
HKW085_099BAQ	4.7	7.4	11	6070		12.6	25.1	680		
HKW085_099BAL	10.0	7.3		13100		24.7	50.2	680		
HKW085_099BAI	15.6	6.8		21900		35.0	78.1	680		
HKW108_080CAN	4.9	10	15	4680	30000	10.6	16.2	820	1.5	
HKW108_080CAI	10.4			9930		21.3	32.4	820		
HKW108_080CAF	16.0			15300		31.9	48.6	820		
HKW108_140CAI	10.2	20	30	4870		24.4	37.4	1430		
HKW108_140CAF	15.6			7450		36.6	56.1	1430		
HKW108_140CAD	25.0			11900		54.8	84.2	1430		
HKW108_200CAJ	9.0	30	45	2870	24000	23.1	35.6	2040	2.4	
HKW108_200CAF	15.5			4940		38.4	59.3	2040		
HKW108_200CAD	25.0			7960		57.7	88.9	2040		
HKW155_080CRR	8.8	22	33	3820		18000	18.2	27.6		5200
HKW155_080CRP	14	22		6080			28.5	43.1		5200
HKW155_080CAR	10.3	28	42	3510		24000	19.0	29.4		5200
HKW155_080CAP	16	28		5500	29.6		46.0	5200		
HKW155_120CAR	10	48	75	1990	21.8		36.3	7800		
HKW155_120CAK	23	48		4600	49.5		82.5	7800		
HKW155_120CAH	32	46		6640	65.1		113.0	7800		
HKW155_120CAF	43	44	100	9330	82.9		151.0	7800		
HKW155_160CAR	10	68		1410	23.2	36.3	10400			
HKW155_160CAP	16	68		2250	36.3	56.7	10400			
HKW155_160CAH	32	68		4500	72.6	113.0	10400			
HKW155_160CAF	44	66		6370	93.8	151.0	10400			
HKW155_160CAD	63	58		10300	123.0	227.0	10400			
HKW195_120CAV	7.2	80	120	860	20000	19.4	35.1	16000	3.2	
HKW195_120CAP	16			1910		42.1	76.0	16000		
HKW195_120CAI	34			4050		84.1	152.0	16000		
HKW195_120CAF	52	75	6620	117.0		228.0	16000			
HKW195_120CAE	62		7900	140.0		274.0	16000			
HKW195_180CAT	10	120	180	795		20000	26.1	47.2		24000
HKW195_180CAP	16			1280	42.1		76.0	24000		
HKW195_180CAM	23			1830	58.2		105.0	24000		
HKW195_180CAJ	31			2470	75.7		137.0	24000		
HKW195_180CAF	52			4140	126.0		228.0	24000		
HKW195_180CAC	101			110	8770		227.0	456.0	24000	
HKW195_300CAM	23	200	300	1100	20000	58.2	105.0	40000		
HKW195_300CAJ	30			1440		75.7	137.0	40000		
HKW195_300CAF	52			2490		126.0	228.0	40000		
HKW195_300CAE	63			3010		151.0	274.0	40000		
HKW195_300CAC	105			5010		252.0	456.0	40000		
HKW195_300CAX	175			8350		454.0	821.0	40000		

Servo Motors
 HKW Series

540 VDC voltage supply												
Motor	Winding resistance line-line (25°C) Rb [Ω]	Winding inductance line-line Ld [mH]	Winding inductance line-line Lq [mH]	Number of poles	Short-circuit current Icc [A _{rms}]	Motor mass M [kg]	Cooling water flow [T _{max} 25°C] waterflow [l/min]	Back emf constant at 1000 min ⁻¹ Ke [V _{rms}]	Frequency at max speed			
HKW085_066BAU	5.37	52.20	45.5	4	5.5	3.9	2	45.20	1667			
HKW085_066BAP	1.35	13.00	11.4		10.9							
HKW085_066BAK	0.337	3.26	2.84		21.9							
HKW085_099BAQ	2.16	22.70	19.8		10.2	5.2	3	36.50				
HKW085_099BAL	0.541	5.68	4.96		20.3			18.30				
HKW085_099BAI	0.205	2.35	2.05		31.5			11.70				
HKW108_080CAN	2.78	22.40	19.7	6	10.3	6.5	3	55.20	1500			
HKW108_080CAI	0.694	5.61	4.92		20.6			6.5		27.60		
HKW108_080CAF	0.309	2.49	2.19		30.9			6.5		18.40		
HKW108_140CAI	0.96	9.79	8.6		20.7	11	5	48.40				
HKW108_140CAF	0.427	4.35	3.82		31.0			11		32.20		
HKW108_140CAD	0.189	1.93	1.7		46.5			11		21.50		
HKW108_200CAJ	1.5	17.30	15.2		18.6	14	7	76.80				
HKW108_200CAF	0.545	6.21	5.46		31.0			14		46.10		
HKW108_200CAD	0.241	2.76	2.43		46.4			14		30.70		
HKW155_080CRR	1.45	18.80	15.6		6	17.0	8	5		72.20	1200	
HKW155_080CRP	0.575	7.68	6.4			26.5				8		46.20
HKW155_080CAR	1.45	18.80	15.6			20.8				8		88.40
HKW155_080CAP	0.575	7.68	6.4	32.5		8			56.60			
HKW155_120CAR	1.76	28.10	23.4	20.9		12			8	133.00	900	
HKW155_120CAK	0.32	5.45	4.54	47.2						12		58.30
HKW155_120CAH	0.177	2.88	2.4	64.9			12	42.40				
HKW155_120CAF	0.0994	1.62	1.35	86.6			12	31.80				
HKW155_160CAR	2.07	37.50	31.3	20.8			16	10		177.00		
HKW155_160CAP	0.823	15.40	12.8	32.4						16		113.00
HKW155_160CAH	0.209	3.84	3.2	65.0		16			56.60			
HKW155_160CAF	0.117	2.16	1.8	86.6		16			42.40			
HKW155_160CAD	0.0522	0.96	0.8	130.0		16			28.30			
HKW195_120CAV	2.38	67.50	13	15.8		23			7	261.00	900	
HKW195_120CAP	0.492	14.40	3.24	33.9			23	120.00				
HKW195_120CAI	0.122	3.60	1.44	68.2			23	60.10				
HKW195_120CAF	0.0563	1.60	1	102.4			23	40.10				
HKW195_120CAE	0.0381	1.11	50.5	122.8			23	33.40				
HKW195_180CAT	1.66	54.60	19.4	21.2	35		10	291.00		800		
HKW195_180CAP	0.617	21.00	10.1	34.1		35		180.00				
HKW195_180CAM	0.332	11.00	6	47.3		35		130.00				
HKW195_180CAJ	0.191	6.49	2.16	61.3		35		100.00				
HKW195_180CAF	0.0706	2.34	0.54	102.3		35		60.10				
HKW195_180CAC	0.017	0.58	16.9	204.9		35		30.10				
HKW195_300CAM	0.466	17.90	10	47.2	58	16	217.00	1000				
HKW195_300CAJ	0.269	10.60	3.6	61.4			58		167.00			
HKW195_300CAF	0.0993	3.82	2.5	102.1			58		100.00			
HKW195_300CAE	0.0672	2.65	-	122.8			58		83.50			
HKW195_300CAC	0.0239	0.95	0.9	204.6			58		50.10			
HKW195_300CAX	0.00747	0.29	0.278	367.6			58		27.80			

Frameless AC Brushless Motor - HKW Series
 Technical Data

540 VDC voltage supply									
Motor	S1/S6 Power PS1 [kW]	Low speed torque M _o [Nm]	Low speed S6 torque M _{oS6} [Nm]	Base speed Nb [min ⁻¹]	Max speed N [min ⁻¹]	Permanent current at low speed I _o [A _{rms}]	S6 current at low speed I _{oS6} [A _{rms}]	Rotor inertia J [kgmm ²]	Thermal time constant Tth [min]
HKW242_225DAN	15	280	360	510	11 000	37.2	49.9	105 000	4
HKW242_225DAF	33	280		1 130	13 000	74.4	99.7	105 000	
HKW242_225DAD	50	280		1 710		112.0	150.0	105 000	
HKW242_225DAC	67	275		2 330		146.0	199.0	105 000	
HKW242_225DAB	101	260		3 710		206.0	299.0	105 000	
HKW242_375DAF	30	480	600	600		13 000	76.8	99.7	
HKW242_375DAD	49	480		975	115.0		150.0	175 000	
HKW242_375DAC	67	480		1 330	154.0		199.0	175 000	
HKW242_375DAB	101	480		2 010	230.0		299.0	175 000	
HKW242_375DAA	200	460		4 150	439.0		598.0	175 000	
HKW310_200HAJ	37	600	900	590	8 000	87.1	141.0	230 000	5
HKW310_200HAH	46	580		760		105.0	177.0	230 000	
HKW310_200HAE	77	575		1 280		166.0	282.0	230 000	
HKW310_200HAD	95	565		1 610		204.0	353.0	230 000	
HKW310_200HAC	115	550		2 000		265.0	471.0	230 000	
HKW310_300HAJ	35.4	940	1 350	360	8 000	91.2	141.0	340 000	
HKW310_300HAH	45	940		460		114.0	177.0	340 000	
HKW310_300HAE	76	930		780		180.0	282.0	340 000	
HKW310_300HAD	95	920		990		223.0	353.0	340 000	
HKW310_300HAC	120	900		1 270		290.0	471.0	340 000	
HKW310_400HAJ	34	1 250	1 800	260	8 000	91.0	141.0	450 000	
HKW310_400HAH	44.5			340		114.0	177.0	450 000	
HKW310_400HAF	62			475		152.0	235.0	450 000	
HKW310_400HAE	75			575		182.0	282.0	450 000	
HKW310_400HAD	94			720		227.0	353.0	450 000	
HKW310_400HAC	120	1 080	1 800	910	8 000	303.0	471.0	450 000	
HKW310_400HAY	230			2 030		520.0	942.0	450 000	

Servo Motors
 HKW Series

540 VDC voltage supply									
Motor	Winding resistance line-line (25°C) Rb [Ω]	Winding inductance line-line Ld [mH]	Winding inductance line-line Lq [mH]	Number of poles	Short-circuit current Icc [A _{rms}]	Motor mass M [kg]	Cooling water flow [T _{max} 25°C] water flow [l/min]	Back emf constant at 1000 min ⁻¹ Ke [V _{rms}]	Frequency at max speed
HKW242_225DAN	1.52	41.90	41.5	8	32.5	70	18	489.00	733
HKW242_225DAF	0.381	10.50	10.4		64.7			244.00	
HKW242_225DAD	0.169	4.66	4.61		97.5			163.00	
HKW242_225DAC	0.0952	2.62	2.59		129.8			122.00	
HKW242_225DAB	0.0424	1.16	1.15		195.4			81.50	
HKW242_375DAF	0.566	17.40	17.3		64.9	120	25	407.00	867
HKW242_375DAD	0.251	7.74	7.68		97.6			272.00	
HKW242_375DAC	0.141	4.36	4.32		130.2			204.00	
HKW242_375DAB	0.063	1.94	1.92		195.3			136.00	
HKW242_375DAA	0.0157	0.48	0.476		393.2			67.90	
HKW310_200HAJ	0.392	9.25	7.8	16	76.2	120	15	431.00	1067
HKW310_200HAH	0.235	5.92	4.99		95.3			345.00	
HKW310_200HAE	0.0929	2.31	1.95		152.0			215.00	
HKW310_200HAD	0.0588	1.48	1.25		189.7			172.00	
HKW310_200HAC	0.0331	0.83	0.702		253.3			129.00	
HKW310_300HAJ	0.525	13.90	11.7		76.1	170	20	646.00	
HKW310_300HAH	0.315	8.88	7.49		95.1			517.00	
HKW310_300HAE	0.124	3.47	2.93		151.9			323.00	
HKW310_300HAD	0.0788	2.22	1.87		190.2			258.00	
HKW310_300HAC	0.0443	1.25	1.05		254.7			194.00	
HKW310_400HAJ	0.658	18.50	15.6	76.1	220	21	861.00	800	
HKW310_400HAH	0.395	11.80	9.98	95.2			689.00		
HKW310_400HAF	0.222	6.66	5.62	126.8		25	25	517.00	1067
HKW310_400HAE	0.156	4.62	3.9	152.3				431.00	
HKW310_400HAD	0.0987	2.96	2.5	190.2				345.00	
HKW310_400HAC	0.0555	1.66	1.4	254.0	30	30	258.00		
HKW310_400HAY	0.0139	0.42	0.351	506.6			129.00		

Servo Motors
HKW Series

Associated Drives

540 VDC voltage supply								
Motor	PARKER DIGIVEX				PARKER AC890SD			
	Drive	Speed limit ⁽¹⁾ N _{max} [min ⁻¹]	Low speed torque M _o [Nm]	Low speed torque S6 M _{oS6} [Nm]	Drive	Speed limit ⁽¹⁾ N _{max} [min ⁻¹]	Low speed torque M _o [Nm]	Low speed torque S6 M _{oS6} [Nm]
HKW085_066BAU	DIGIVEX 32/64	45 000	4.9	7.3	890SD-532100B	11 283	4.3	4.3
HKW085_066BAP	DIGIVEX 32/64		4.5	6.1	890SD-53216SB	22 566	4.5	4.5
HKW085_066BAK	DIGIVEX 50/80		4.2	4.8	890SD-532300C	30 000	4.1	4.1
HKW085_099BAQ	DIGIVEX 32/64		7.4	9.9	890SD-53216SB	13 973	7.4	7.4
HKW085_099BAL	DIGIVEX 32/64		6.7	6.7	890SD-532300C	27 869	6.5	6.5
HKW085_099BAI	DIGIVEX 50/80		6.8	6.8	890SD-532450D	30 000	6.6	6.6
HKW108_080CAN	DIGIVEX 32/64	30 000	10.0	15.0	890SD-53216SB	9 239	10.0	13.0
HKW108_080CAI	DIGIVEX 50/80		10.0	15.0	890SD-532300C	18 478	10.0	10.2
HKW108_080CAF	DIGIVEX 50/80		10.0	10.9	890SD-532450D	20 000	10.0	10.5
HKW108_140CAI	DIGIVEX 50/80		20.0	28.4	890SD-532300C	10 537	18.0	18.0
HKW108_140CAF	DIGIVEX 50/80		19.3	19.3	890SD-532450D	15 839	18.6	18.6
HKW108_140CAD	DIGIVEX 100/120		20.0	25.2	890SD-532240C	6 641	26.0	26.0
HKW108_200CAJ	DIGIVEX 32/64		29.4	29.4	890SD-532450D	11 063	26.6	26.6
HKW108_200CAF	DIGIVEX 50/80		27.6	27.6	890SD-432730E	10 000	30.0	38.5
HKW108_200CAD	DIGIVEX 100/120		30.0	35.8	-	-	-	-
HKW155_080CRR	DIGIVEX 32/64		24 000	22.0	27.1	890SD-532240C	7 064	22.0
HKW155_080CRP	DIGIVEX 50/80	22.0		27.1	890SD-53230SC	11 039	21.6	21.6
HKW155_080CAR	DIGIVEX 50/80	28.0		42.0	890SD-532300C	5 769	28.0	31.4
HKW155_080CAP	DIGIVEX 100/120	28.0		42.0	890SD-532450D	9 011	28.0	31.0
HKW155_120CAR	DIGIVEX 50/80	48.0		73.1	890SD-532300C	3 835	48.0	48.0
HKW155_120CAK	DIGIVEX 100/120	48.0		64.3	890SD-432730E	8 748	48.0	69.1
HKW155_120CAH	DIGIVEX 150	46.0		70.4	890SD-432730E	10 000	46.0	50.4
HKW155_120CAF	DIGIVEX 300	44.0		75.0	890SD-432870E	10 000	44.0	44.7
HKW155_160CAR	DIGIVEX 50/80	68.0		97.4	890SD-532300C	2 881	64.5	64.5
HKW155_160CAP	DIGIVEX 100/120	68.0		100.0	890SD-532450D	4 513	63.7	63.7
HKW155_160CAH	DIGIVEX 150	68.0		93.9	890SD-432730E	9 011	68.0	68.0
HKW155_160CAF	DIGIVEX 300	66.0		100.0	890SD-432870E	10 000	63.3	63.3
HKW155_160CAD	DIGIVEX 300	58.0		93.5	-	-	-	-
HKW195_120CAV	DIGIVEX 32/64	17 200		80.0	80.0	890SD-532240C	1 954	80.0
HKW195_120CAP	DIGIVEX 100/120	20 000	80.0	111.7	890SD-532590D	4 250	80.0	80.0
HKW195_120CAI	DIGIVEX 150		80.0	83.7	890SD-432730E	8 486	72.3	72.3
HKW195_120CAF	DIGIVEX 300		75.0	111.7	890SD-433105F	10 000	69.2	69.2
HKW195_120CAE	DIGIVEX 300		75.0	92.9	890SD-433145F	10 000	72.3	72.3
HKW195_180CAT	DIGIVEX 50/80	15 900	120.0	134.9	890SD-532300C	1 753	101.1	101.1
HKW195_180CAP	DIGIVEX 100/120	20 000	120.0	167.5	890SD-532590D	2 833	120.0	120.0
HKW195_180CAM	DIGIVEX 100/120		120.0	121.2	890SD-432730E	3 923	120.0	130.3
HKW195_180CAJ	DIGIVEX 100/120		112.1	112.1	890SD-432730E	5 100	120.0	120.0
HKW195_180CAF	DIGIVEX 300		120.0	167.5	890SD-433105F	8 486	102.9	102.9
HKW195_180CAC	DIGIVEX 100/120		200.0	202.1	890SD-433216G	10 000	101.8	101.8
HKW195_300CAM	DIGIVEX 100/120		186.8	186.8	890SD-432730E	2 350	200.0	217.1
HKW195_300CAJ	DIGIVEX 300		200.0	279.2	890SD-432730E	3 054	200.0	200.0
HKW195_300CAF	DIGIVEX 300		200.0	232.3	890SD-433105F	5 100	171.4	171.4
HKW195_300CAE	-	-	-	-	890SD-433145F	6 108	178.8	178.8
HKW195_300CAC	-	-	-	-	890SD-433216G	10 000	166.7	166.7
HKW195_300CAX	-	-	-	-	890SD-433420H	10 000	168.7	168.7

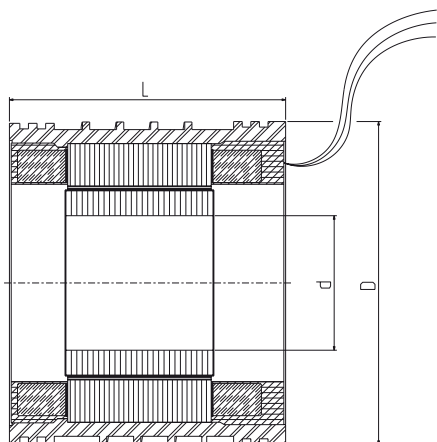
(1) Due to the back emf or the maximal drive frequency

540 VDC voltage supply								
Motor	PARKER DIGIVEX				PARKER AC890SD			
	Drive	Speed limit ⁽¹⁾ N _{max} [min ⁻¹]	Low speed torque M _o [Nm]	Low speed torque S6 M _{oS6} [Nm]	Drive	Speed limit ⁽¹⁾ N _{max} [min ⁻¹]	Low speed torque M _o [Nm]	Low speed torque S6 M _{oS6} [Nm]
HKW242_225DAN	DIGIVEX 100/120	10200	280.0	360.0	890SD-532450D	1043	255.9	255.9
HKW242_225DAF	DIGIVEX 150	13000	280.0		890SD-432730E	2090	280.0	280.0
HKW242_225DAD	DIGIVEX 300		280.0		890SD-433105F	3129	270.0	270.0
HKW242_225DAC	DIGIVEX 300		275.0		890SD-433145F	4180	254.3	254.3
HKW242_225DAB	-		-		-	890SD-433216G	6258	260.0
HKW242_375DAF	DIGIVEX 150	12000	480.0	600.0	890SD-432730E	1253	475.0	475.0
HKW242_375DAD	DIGIVEX 300	13000			890SD-433105F	1875	450.8	450.8
HKW242_375DAC	DIGIVEX 300	13000			890SD-433145F	2500	420.8	420.8
HKW242_375DAB	-	-			-	890SD-433216G	3750	438.3
HKW242_375DAA	-	-	-	-	890SD-433480H	7500	448.5	448.5
HKW310_200HAJ	DIGIVEX 150	8000	600.0	677.1	890SD-432870E	1183	600.0	600.0
HKW310_200HAH	DIGIVEX 300	8000	580.0	900.0	890SD-433105F	1478	580.0	580.0
HKW310_200HAE	DIGIVEX 300	8000	575.0	677.1	890SD-433156F	2372	533.4	533.4
HKW310_200HAD	DIGIVEX 300	3314	565.0	565.0	890SD-433216G	2965	565.0	565.0
HKW310_200HAC	-	-	-	-	890SD-433316G	3750	550.0	550.0
HKW310_300HAJ	DIGIVEX 150	7200	940.0	1015.7	890SD-432870E	789	927.6	927.6
HKW310_300HAH	DIGIVEX 300	8000	940.0	1350.0	890SD-433105F	986	890.5	890.5
HKW310_300HAE	DIGIVEX 300	8000	930.0	1015.7	890SD-433156F	1579	795.7	795.7
HKW310_300HAD	DIGIVEX 300	2209	875.3	875.3	890SD-433216G	1977	866.4	866.4
HKW310_300HAC	-	-	-	-	890SD-433316G	2629	887.6	887.6
HKW310_400HAJ	DIGIVEX 150	5200	1250.0	1354.2	890SD-432870E	592	1236.3	1236.3
HKW310_400HAH	DIGIVEX 300	6800	1250.0	1800.0	890SD-433105F	740	1184.2	1184.2
HKW310_400HAF	DIGIVEX 300	8000	1250.0	1625.1	890SD-433145F	986	1110.2	1110.2
HKW310_400HAE	DIGIVEX 300	8000	1250.0	1354.2	890SD-433156F	1183	1057.7	1057.7
HKW310_400HAD	DIGIVEX 300	1652	1168.3	1168.3	890SD-433216G	1478	1156.4	1156.4
HKW310_400HAC	-	-	-	-	890SD-433316G	1977	1179.9	1179.9
HKW310_400HAY	-	-	-	-	890PX/0580/B/00/A	3750	1080.0	1080.0

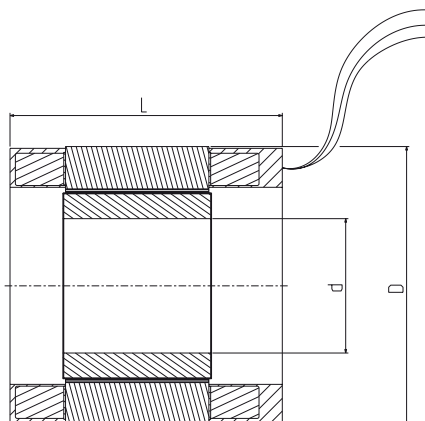
(1) Due to the back emf or the maximal drive frequency

Dimensions

Stator with cooling jacket



Stator without housing



Servo Motors
HKW Series

Dimensions	Without housing			With cooling jacket						
	d [mm]	D [mm]	L [mm]	d [mm]	D [mm]	L [mm]				
HKW085_066	32	85	134	32	100	136				
HKW085_099			167			169				
HKW108_080			148			150				
HKW108_140	47	108	208	47	130	210				
HKW108_200			268			270				
HKW155_080			152			154				
HKW155_120	75	155.5	192	75	180	194				
HKW155_160			232			234				
HKW195_120CAx			214			216				
HKW195_120CAF	90	195	223	90	220	225				
HKW195_120CAE			231			233				
HKW195_180CAx			274			276				
HKW195_180CAF			283			285				
HKW195_180CAC			291			293				
HKW195_300CAM/J			394			396				
HKW195_300CAF			403			405				
HKW195_300CAE/C			411			413				
HKW242_375DAN/F			130			242	313	130	270	315
HKW242_375DAD							322			324
HKW242_375DAC	330	332								
HKW242_375DAB	333	335								
HKW242_226DAF	463	465								
HKW242_226DAD	472	474								
HKW242_226DAC	480	482								
HKW242_226DAB	477	479								
HKW310_200HAJ	180	310	308	180	340	310				
HKW310_200HAH			317			319				
HKW310_200HAE			328			330				
HKW310_200HAD			322			324				
HKW310_200HAC			325			327				
HKW310_300HAJ			408			410				
HKW310_300HAH			417			419				
HKW310_300HAE			428			430				
HKW310_300HAD			422			424				
HKW310_300HAC			425			427				
HKW310_400HAJ			508			510				
HKW310_400HAH			517			519				
HKW310_400HAF			525			527				
HKW310_400HAE			528			530				
HKW310_400HAD			522			524				
HKW310_400HAC			525			527				
HKW310_400HAZ	540	542								

Order Code

HKW Series

	1	2	3	4	5	6	7	8	9
Order example	HK	W	155	-	120	CAP	R	0	000

1 Motor type	HK	Frameless permanent magnet servomotors
2 Cooling	W	Water cooling (standard)
	A	Natural convection (available with derating, consult us)
3 External diameter	085	85 mm
	108	108 mm
	155	155 mm
	195	195 mm
	242	242 mm
	310	310 mm
4 Element	-	Motor (stator + rotor)
	S	Stator
	R	Rotor
5 Length L [mm]	136	
	169	see table "Dimensions"
	150	
	...	

6 Torque/Speed characteristics	BAU	
	BAP	see table "Technical data"
	BAK	
	...	
7 Fix Code	R	
8 Mechanical options	0	Without housing, without hub
	1	With housing, without hub
	2	Without housing, with hub
	3	With housing, with hub
9 Interface	000	Standard motor

Correspondence table between HW and HKW

HW	HKW	HW	HKW	HW	HKW
HW420BU	HKW085_066BAU	HW840CP	HKW155_160CAP	HWA30DC	HKW242_225DAC
HW420BP	HKW085_066BAP	HW840CH	HKW155_160CAH	HWA30DB	HKW242_225DAB
HW420BK	HKW085_066BAK	HW840CF	HKW155_160CAF	HWA50DF	HKW242_375DAF
HW430BQ	HKW085_099BAQ	HW840CD	HKW155_160CAD	HWA50DD	HKW242_375DAD
HW430BL	HKW085_099BAL	HW920CV	HKW195_120CAV	HWA50DC	HKW242_375DAC
HW430BI	HKW085_099BAI	HW920CP	HKW195_120CAP	HWA50DB	HKW242_375DAB
HW620CN	HKW108_080CAN	HW920CI	HKW195_120CAI	HWA50DA	HKW242_375DAA
HW620CI	HKW108_080CAI	HW920CF	HKW195_120CAF	HWB20HJ	HKW310_200HAJ
HW620CF	HKW108_080CAF	HW920CE	HKW195_120CAE	HWB20HH	HKW310_200HAH
HW635CI	HKW108_140CAI	HW930CT	HKW195_180CAT	HWB20HE	HKW310_200HAE
HW635CF	HKW108_140CAF	HW930CP	HKW195_180CAP	HWB20HD	HKW310_200HAD
HW635CD	HKW108_140CAD	HW930CM	HKW195_180CAM	HWB20HC	HKW310_200HAC
HW650CJ	HKW108_200CAJ	HW930CJ	HKW195_180CAJ	HWB30HJ	HKW310_300HAJ
HW650CF	HKW108_200CAF	HW930CF	HKW195_180CAF	HWB30HH	HKW310_300HAH
HW650CD	HKW108_200CAD	HW930CC	HKW195_180CAC	HWB30HE	HKW310_300HAE
HW820RR	HKW155_080CRR	HW950CM	HKW195_300CAM	HWB30HD	HKW310_300HAD
HW820RP	HKW155_080CRP	HW950CJ	HKW195_300CAJ	HWB30HC	HKW310_300HAC
HW820CR	HKW155_080CAR	HW950CF	HKW195_300CAF	HWB40HJ	HKW310_400HAJ
HW820CP	HKW155_080CAP	HW950CE	HKW195_300CAE	HWB40HH	HKW310_400HAH
HW830CR	HKW155_120CAR	HW950CC	HKW195_300CAC	HWB40HF	HKW310_400HAF
HW830CK	HKW155_120CAK	HW950CX	HKW195_300CAX	HWB40HE	HKW310_400HAE
HW830CH	HKW155_120CAH	HWA30DN	HKW242_225DAN	HWB40HD	HKW310_400HAD
HW830CF	HKW155_120CAF	HWA30DF	HKW242_225DAF	HWB40HC	HKW310_400HAC
HW840CR	HKW155_160CAR	HWA30DD	HKW242_225DAD	HWB40HY	HKW310_400HAY

Frameless Servo Motor - TK Series

Overview

Description

Delivered as separate rotor and stator to be integrated into the mechanical structure of the machine, TK series torque motors lead to simplified designs, reduced costs, and increased accuracy.

TK series is distinguished from existing solutions by their exceptional robustness, making them particularly suited to harsh environments.

Benefiting from Parker's unprecedented know-how in the design and manufacture of torque motors, TK series can also be delivered as complete sub-assemblies including frame, cooling system, bearings, feedback sensor...

Advantages

- Simplified mechanical designs
- Reduced sizes and weights
- Reduced maintenance
- Increased rigidity and accuracy

Applications

- Material Forming
- Material Handling
- Tooling Machines
- Pulp & Paper

Features

- **Mounting**
Tapped holes on rotor and stator periphery
- **Cooling**
Water cooling (standard) or natural convection (available with derating, consult us)
- **Thermal protection**
PTC and KTY probes fitted into the stator winding
- **Feedback sensor**
Chosen depending upon mechanical conditions, required accuracy and drive specifics: resolver, sin/cos encoder...
- **Electrical connections**
Flying cables without connectors, 2 m length



Technical Characteristics - Overview

Shaft-heights	130 - 200 - 315 - 400 mm
Power supply	400 VAC three-phased
Torque	up to 21000 Nm
Stator winding's insulation according to CEI 60034-1	Class F

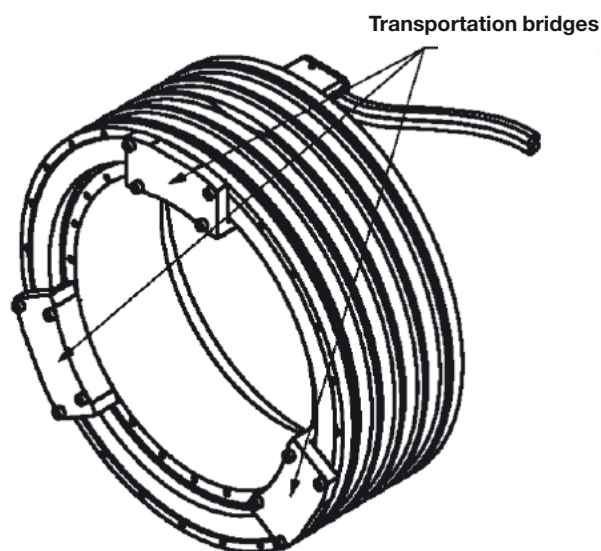
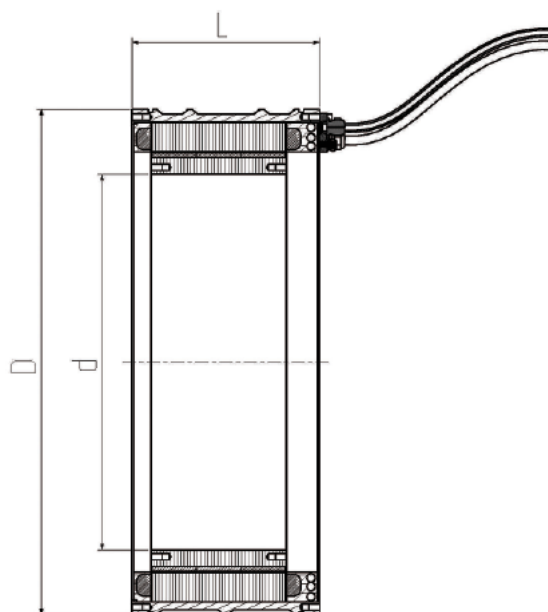
Technical Data

400 V power supply							
Motor	Nominal power P _n [kW]	Nominal speed N _n [min ⁻¹]	Nominal torque M _n [Nm]	Max. speed [min ⁻¹]	Low speed torque [Nm]	Low speed current I _o [A _{rms}]	Drive AC890
TKW131HL	6.9	750	88.3	935	90	15.2	AC890SD-532240C
TKW131HC	17.9	2500	68.3	2500	90	44.3	AC890SD-532590D
TKW132HL	10.1	480	201	720	205	23.4	AC890SD-532300C
TKW132HF	22.2	1120	189	1680	205	50.6	AC890SD-532590D
TKW133HN	14.8	450	314	675	320	35.2	AC890SD-532390D
TKW133HH	30.7	980	299	1470	320	70.4	AC890SD-432730E
TKW133HD	45.1	1550	278	2190	320	106	AC890SD-433145F
TKW134HN	15.3	340	431	510	435	38	AC890SD-532450D
TKW134HJ	27.8	630	422	945	435	64.6	AC890SD-432730E
TKW134HF	46.3	1100	402	1650	435	108	AC890SD-433145F
TKW135HM	27.7	490	540	735	550	65.4	AC890SD-432730E
TKW135HG	53.9	1000	515	1500	550	123	AC890SD-433156F
TKW136HM	30.9	450	656	675	660	72.7	AC890SD-432730E
TKW136HF	71.0	1100	616	1650	660	164	AC890SD-433216G
TKW201HF	20.6	900	219	1000	275	48.6	AC890SD-532590D
TKW201HM	10.0	365	262	540	275	21.6	AC890SD-532300C
TKW202HF	45	895	480	1040	610	108	AC890SD-433145F
TKW202HS	15.8	255	592	380	610	35.3	AC890SD-532450D
TKW203HD	57.5	670	819	940	960	133	AC890SD-433156F
TKW203HE	53.8	615	835	905	960	123	AC890SD-433156F
TKW203HR	18.2	185	936	275	960	43.2	AC890SD-532590D
TKW204HI	71.2	595	1140	890	1300	163	AC890SD-433250G
TKW204HV	18.9	140	1280	170	1300	46.5	AC890SD-532590D
TKW205HH	80.7	520	1480	780	1650	184	AC890SD-433316G
TKW205HM	51.8	315	1570	470	1650	118	AC890SD-433156F
TKW205HU	22.2	130	1630	195	1650	55.1	AC890SD-432730E
TKW206HG	92.1	485	1810	725	2000	209	AC890SD-433316G
TKW206HM	51.3	255	1920	380	2000	120	AC890SD-433156F
TKW206HS	30.9	150	1960	225	2000	76.1	AC890SD-432870E
TKW208HF	106	405	2500	605	2700	242	AC890SD-433361G
TKW208HM	51	185	2630	275	2700	121	AC890SD-433156F
TKW208HS	29.4	105	2670	135	2700	77.1	AC890SD-432870E
TKW301HB	36.1	695	497	695	680	87.6	AC890SD-433145F
TKW301HJ	14.7	215	651	320	680	31.1	AC890SD-532390D
TKW302HE	64	475	1290	605	1520	143	AC890SD-433216G
TKW302HJ	46	315	1390	470	1520	98.2	AC890SD-433145F
TKW302HP	23.2	150	1480	220	1520	50.7	AC890SD-432730E
TKW303HC	83.1	375	2120	550	2380	183	AC890SD-433316G
TKW303HJ	47.8	200	2270	295	2380	103	AC890SD-433145F
TKW303HN	30.5	125	2330	185	2380	68.4	AC890SD-432730E

400 V power supply							
Motor	Nominal power Pn [kW]	Nominal speed Nn [min ⁻¹]	Nominal torque Mn [Nm]	Max. speed [min ⁻¹]	Low speed torque [Nm]	Low speed current Io [A _{rms}]	Drive AC890
TKW304HG	96.4	310	2970	465	3250	211	AC890SD-433316G
TKW304HM	51.1	155	3150	230	3250	112	AC890SD-433156F
TKW304HN	44.8	135	3160	195	3250	99.1	AC890SD-433145F
TKW305HG	99.1	245	3870	360	4100	213	AC890SD-433316G
TKW305HN	50.6	120	4030	175	4100	113	AC890SD-433156F
TKW305HO	42.4	100	4050	125	4100	100	AC890SD-433145F
TKW306HF	113	230	4710	340	4950	245	AC890SD-433361G
TKW306HM	53.9	105	4900	150	4950	122	AC890SD-433156F
TKW306HO	41.3	80	4930	120	4950	101	AC890SD-433145F
TKW308HC	141	210	6400	315	6740	309	AC890SD-433480H
TKW308HL	55.7	80	6650	115	6740	135	AC890SD-433216G
TKW308HO	39.2	56	6690	80	6740	103	AC890SD-433145F
TKW30AHD	162	190	8110	280	8450	351	AC890SD-433520H
TKW30AHL	52	59	8420	70	8450	135	AC890SD-433216G
TKW30AHO	35.4	40	8450	60	8450	103	AC890SD-433145F
TKW401HA	45.6	380	1150	415	1460	108	AC890SD-433145F
TKW401HG	24.4	170	1370	255	1460	53	AC890SD-432730E
TKW402HG	78.8	265	2840	375	3270	180	AC890SD-433316G
TKW402HI	69	225	2930	335	3270	155	AC890SD-433250G
TKW402HP	42.5	130	3110	195	3270	94.8	AC890SD-433145F
TKW403HC	106	220	4590	325	5100	237	AC890SD-433361G
TKW403HJ	66.3	130	4860	195	5100	148	AC890SD-433216G
TKW403HL	56.7	110	4910	160	5100	127	AC890SD-433156F
TKW404HI	124	185	6400	275	6900	278	AC890SD-433420H
TKW404HQ	63.7	90	6760	135	6900	151	AC890SD-433250G
TKW404HR	60.3	85	6770	125	6900	139	AC890SD-433216G
TKW405HH	134	155	8270	200	8800	308	AC890SD-433480H
TKW405HQ	65.1	72	8630	105	8800	154	AC890SD-433250G
TKW406HG	148	140	10100	210	10600	338	AC890SD-433520H
TKW406HP	71.4	65	10500	95	10600	169	AC890SD-433250G
TKW406HQ	63.9	58	10500	70	10600	155	AC890SD-433250G
TKW408HF	166	115	13800	170	14400	379	AC890SD-433590J
TKW408HN	84.8	57	14200	85	14400	211	AC890SD-433316G
TKW408HQ	59.9	40	14300	60	14400	158	AC890SD-433250G
TKW40AHE	184	100	17500	145	18100	424	AC890SD/5/0685K
TKW40AHM	88.3	47	17900	70	18100	225	AC890SD-433361G
TKW40AHQ	54.9	29	18100	40	18100	159	AC890SD-433250G
TKW40CHD	207	93	21200	135	21900	482	AC890SD/5/0798K
TKW40CHK	97.5	43	21700	60	21900	257	AC890SD-433420H

Dimensions

TK series dimensions			
Motor	L	d	D
TK131HL	90	132	230
TK131HC	100		
TK132HL/HN	140		
TK132HF	150		
TK133HN	190		
TK133HH	205		
TK133HD	215		
TK134HN	246		
TK134HJ	256		
TK134HF	261		
TK135HM	306		
TK135HG	311		
TK136HM	356		
TK136HF	376		
TK201	110	250	385
TK202HS	160		
TK202HF	170		
TK203HR	210		
TK203HE/HD	220		
TK204	270		
TK205	340		
TK206	390		
TK208	480		
TK301	110		
TK302HP/HJ	160		
TK302HE	170		
TK303HN/HJ	210		
TK303HC	220		
TK304	275		
TK305	340		
TK306HO/HM	380		
TK306HF	395		
TK308HO/HL	485		
TK308HC	520		
TK30AHO/HL	590		
TK30AHD	650		
TK401	130	620	795
TK402	180		
TK403	230		
TK404	280		
TK405	350		
TK406	400		
TK408	500		
TK40A	605		
TK40C	710		



Order Code

TK-Series

	1	2	3	4	5	6	7	8	9	10	11	12
Order example	TK	W	20	4HG	Y	Z	B	2	R	9	0	00

1 Motor type	TK	Frameless torque motors
2 Cooling method	W	Water cooling (standard)
	A	Natural convection (available with derating, consult us)
3 Shaft heights	13	130 mm
	20	200 mm
	30	315 mm
	40	400 mm
4 Torque/Speed characteristics	1HL	
	1HC	see table TK-Series technical data
	2HL	
	...	
5 Feedback sensor	K	Without sensor
	B	Direct Endat encoder
6 Transportation bridge	B	Bridges on both sides
	C	Bridges on cables output side
	D	Bridges on cables output opposite side
	Z	Without bridges (standard)
7 Cables output	B	Output towards the rear
8 Cable length	2	2 m
9 Fix code	R	
10 Connections	1	Flying cables (3 phases + ground)
	9	Terminal box
11 Thermal protection	0	1 PTC 140°C + 1 PTC 150°C + 1 KTY (+1 in reserve)
12 Mechanical interface	00	Standard motor

Stepper Motor - SY

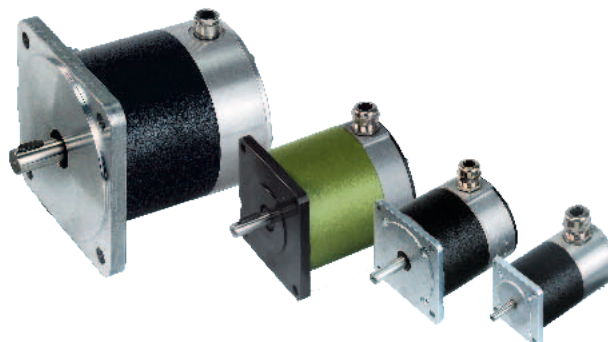
Overview

Description

The stepper motors of the SY-series are two-phase steppers and are designed for industrial applications. Flying leads and terminal box versions are available and encoders can be ordered as optional items.

Features

- 1.8 degree - 2 phase hybrid stepper motors
- Nema 23 , Nema 34 & Nema 42 frame sizes with 1-, 2- and 3-stack motor lengths
- Rated at IP55 as standard
- Option for: IP68 on terminal box version
- Option for: 200 or 500 line encoder
- Option for: Vacuum preparation to 10⁻⁶ Torr
- Holding brake available
- Rear shaft options
- Terminal box or flying leads
- Maximum holding torque 0.45 - 13 Nm
- Current per phase: 4.2 - 10 A (rms)
- Inductance per phase: 1 - 2.7 mH
- Rotor inertias: 12.5 - 1200 kgmm²



Technical Characteristics - Overview

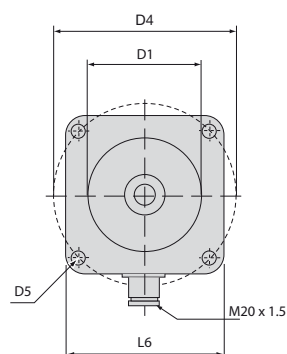
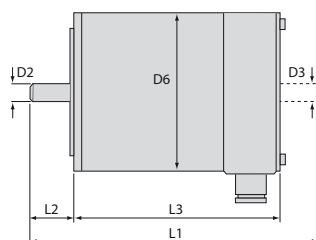
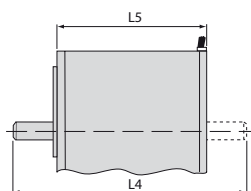
Type	SY56	SY87	SY107
Maximum holding torque [Nm]	0.45...1.25	1.8...5.4	9...13
Current per phase (parallel) [Arms]	4.2...6.5	4.2...8.4	8.0...10
Inductance per phase [mH]	1.0...1.2	1.6...1.7	2.4...2.7
Rotor inertia [kgmm ²]	12.5...32.5	65...195	800...1200
Axial bearing loading [N]	80	180	400
Radial bearing loading [N]	150	280	650
Weight [kg]	0.6...1.35	1.7...2.85	7.2...9.8

Technical Characteristics

Part number	Maximum holding torque [Nm]	Current per phase (parallel) [Arms]	Inductance per phase [mH]	Rotor inertia [kgmm ²]	Weight [kg]	Axial bearing loading [N]	Radial bearing loading [N]
SY561	0.45	4.2	1	12.5	0.6	80	150
SY562	0.85	4.2	2.6	25.0	1		
SY563	1.25	6.5	1.2	37.5	1.35		
SY871	1.8	4.2	1.6	65.0	1.7	180	280
SY872	3.6	6.5	1.5	1300	2.65		
SY873	5.4	8.4	1.7	1950	3.65		
SY1072	9	8	2.4	800	7.2	400	650
SY1073	13	10	2.7	1200	9.8		

Standard IP ratings are IP55 for screw terminal version (T) and IP41 for flying leads (L). Information on additional variants including double shaft, encoder, brake, higher IP rating and alternative windings is available on request.

Dimensions



Dimensions in mm

Series	Type	D1	D2	D3	D4	D5	D6	L1	L2	L3	L4	L5	L6
56	SY561	38.1	6.35	6.35	66.5	5.3	56.5	108	21	76	90	50	56.5
	134							102		116	76		
	162							130		144	104		
87	SY871	73	9.52	9.52	99	6.5	86	137	31.5	85.5	137	60.5	86
	169							117.5		169	92.5		
	201							149.5		201	124.5		
107	SY1072	55.54	15.87	12.7	125.5	8.5	108	238	50	161	-	-	108
	288							211		-	-		

Order Code

	1	2	3	4
Order example	SY	56	2	T

1	Type	
	SY	Stepper motor
2	Frame Size	
	56	Frame Size 56
	87	Frame Size 87
	107	Frame Size 103

3	Stack length	
	1	1-Stack length
	2	2-Stack length
	3	3-Stack length
4	Connection	
	T	Terminal box
	L	Flying leads

High Performance DC Servo Motor - RS Series

Overview

Description

Using high energy magnets, RS DC motors combined with RTS drives are particularly suitable for applications which require a very compact solution or a high dynamic level.

Characteristics and advantages

- High performance characteristics
- Excellent low-speed functioning
- High compactness
- Very long service life
- Rare earth magnets
- Tacho, encoder resolver and brake in option

Features

- **Shaft**
 - RS1 to RS4: Smooth full shaft
 - RS5 and RS6: Full keyed shaft
- **2nd Shaft end**
 - RS1 to RS3: possibility to mount standard tacho or encoder
 - RS5 and RS6: possibility to mount standard tacho, adaptation for encoder mounting in option
- **Output cables 1 m without connector**
- **Options**
 - Brake (RS2 to RS6)
 - Tachometer
 - Adaptation 2nd shaft end for encoder mounting (RS5 and RS6)



Technical Characteristics - Overview

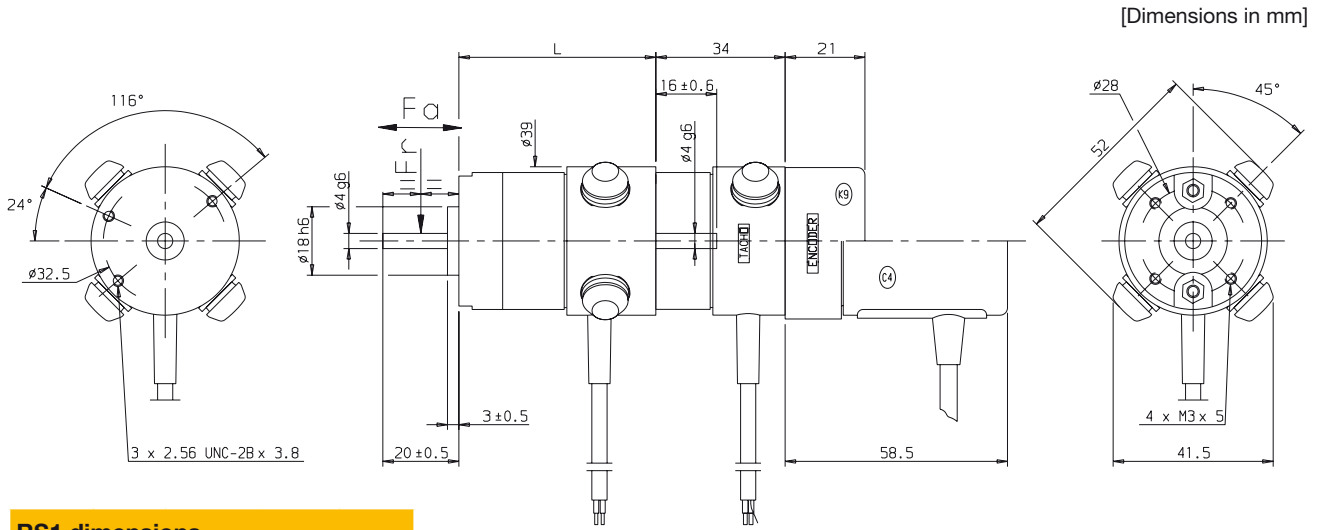
Motor type	DC motors with rare earth magnets
Number of poles	4
Protection degree	<ul style="list-style-type: none"> • RS1 to RS4: IP40 • RS5 and RS6: IP54
Insulation	Class F
Torque at low speed	0.05 ... 13 Nm
Permanent current at low speed	1.5 ... 28 A
Rated voltage	20.7 ... 105 V
Rated speed	2 000 ... 3 000 min ⁻¹
Rotor inertia	2.4 ... 8 300 kgmm ²

Technical Data

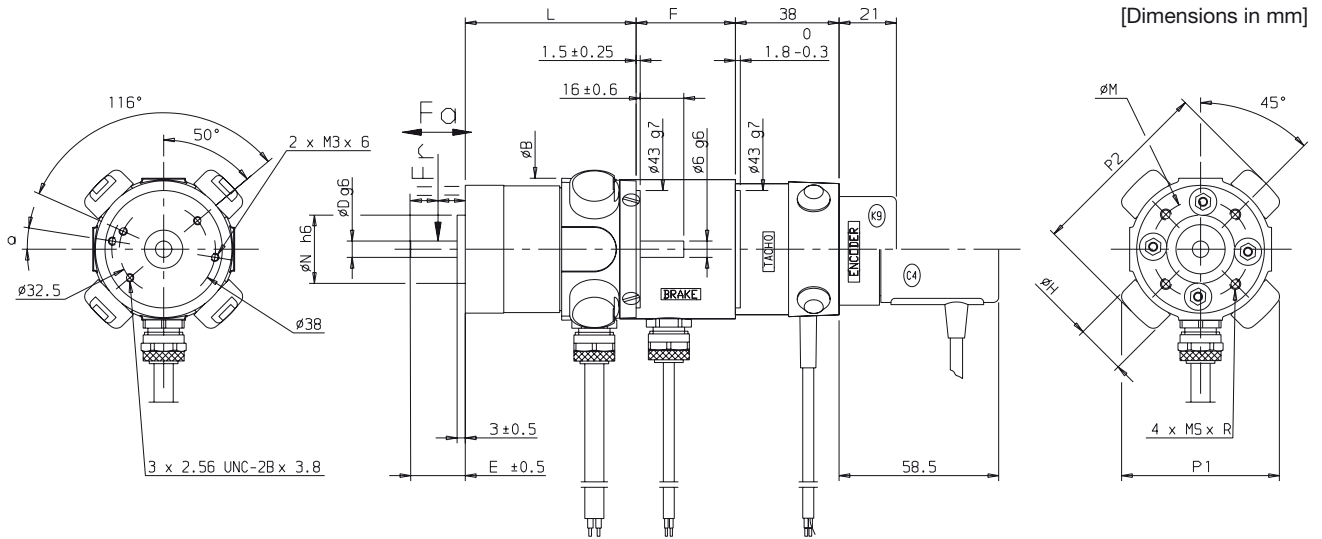
Torque at low speed M_0 [Nm]	Permanent current at low speed I_0 [A]	Rated Voltage U [V]	Rated Speed N [min ⁻¹]	Rotor Inertia [kgmm ²]	Product Code			Typical combination
0.05 0.092 0.13	1.5 2.3 2.7	20.7 21.2 23.7	3000 3000 3000	2.4 4.1 5.8	RS110MR1 RS120GR1 RS130ER1	■ ■ ■	00 00 00	RTS 3/10-40M RTS 3/10-40M RTS 3/10-40M
0.11 0.225 0.232 0.31 0.39	2.5 4.1 2.8 5.6 6	24 25.4 38.6 24 27.6	3000 3000 3000 3000 3000	13 195 195 26 325	RS210LR1 RS220FR1 RS220KR1 RS230CR1 RS240BR1	■ ■ ■ ■ ■	00 00 00 00 00	RTS 3/10-40M RTS 10/20-60 ⁽¹⁾ RTS 3/10-40M RTS 10/20-60 ⁽¹⁾ RTS 10/20-60 ⁽¹⁾
0.28 0.54 0.78 0.98	2.6 4.5 5.9 6.9	49 49 51 53	3000 3000 3000 3000	54 83 110 140	RS310NR1 RS320HR1 RS330ER1 RS340CR1	■ ■ ■ ■	00 00 00 00	RTS 10/20-60 ⁽¹⁾ RTS 10/20-60 ⁽¹⁾ RTS 10/20-60 ⁽¹⁾ RTS 10/20-60 ⁽¹⁾
0.48 0.93 1.3 1.36 1.74	3.6 6.2 8.1 6.6 7	60 60 43 78 90	3000 3000 2000 3000 3000	137 225 310 310 400	RS410RR1 RS420JR1 RS430FR1 RS430HR1 RS440GR1	■ ■ ■ ■ ■	00 00 00 00 00	RTS 10/20-60 ⁽¹⁾ RTS 10/20-60 ⁽¹⁾ RTS 10/20-60 ⁽¹⁾ RTS 12/24-130 T RTS 12/24-130 T
1.9 3.1 4 5	7.9 10.9 13 15	82 92 97 104	2700 2700 2700 2700	1000 1350 1700 2050	RS510LR1 RS520GR1 RS530ER1 RS540CR1	■ ■ ■ ■	00 00 00 00	RTS 12/24-130 T RTS 12/24-130 T RTS 20/40-130 T RTS 20/40-130 T
8 10.8 13	22.3 25 28	100 100 105	2400 2000 2000	5300 6800 8300	RS620GR1 RS630FR1 RS640ER1	■ ■ ■	00 00 00	RTS 40/80-190 T RTS 40/80-190 T RTS 40/80-190 T

⁽¹⁾ M = single phase or T = three phase

Dimensions



RS1 dimensions				
Motor	L	Weight [kg]	Fr ⁽¹⁾ [daN]	Fa ⁽¹⁾ [daN]
RS110	52.1	0.27	6	3
RS120	68.1	0.36	6	3
RS130	84.1	0.45	6	3



RS2, RS3 and RS4 with brake, tacho and encoder dimensions																
Motor	a	N	D	E	B	L	F	P1	P2	H	MSxR	M	Weight [kg]	Fr ⁽¹⁾ [daN]	Fa ⁽¹⁾ [daN]	
RS210	9°	25	6	20	52	63	36.4	58	68	18.5	M4x6	36	0.54	18	10	
RS220	9°	25	6	20	52	79	36.4	58	68	18.5	M4x6	36	0.7	18	10	
RS230	9°	25	6	20	52	95	36.4	58	68	18.5	M4x6	36	0.86	18	10	
RS240	9°	25	6	20	52	111	36.4	58	68	18.5	M4x6	36	1	18	10	
RS310	-	32	9	25	68	80.5	41	69	83	18.5	M5x8	45	0.9	28	15	
RS320	-	32	9	25	68	100.5	41	69	83	18.5	M5x8	45	1.3	28	15	
RS330	-	32	9	25	68	120.5	41	69	83	18.5	M5x8	45	1.6	28	15	
RS340	-	32	9	25	68	140.5	41	69	83	18.5	M5x8	45	2	28	15	
RS410	-	50	11	32	83	95.5	40	82	98	22	M5x8	65	1.2	40	20	
RS420	-	50	11	32	83	115.5	40	82	98	22	M5x8	65	1.8	40	20	
RS430	-	50	11	32	83	135.5	40	82	98	22	M5x8	65	2.4	40	20	
RS440	-	50	11	32	83	155.5	40	82	98	22	M5x8	65	3	40	20	

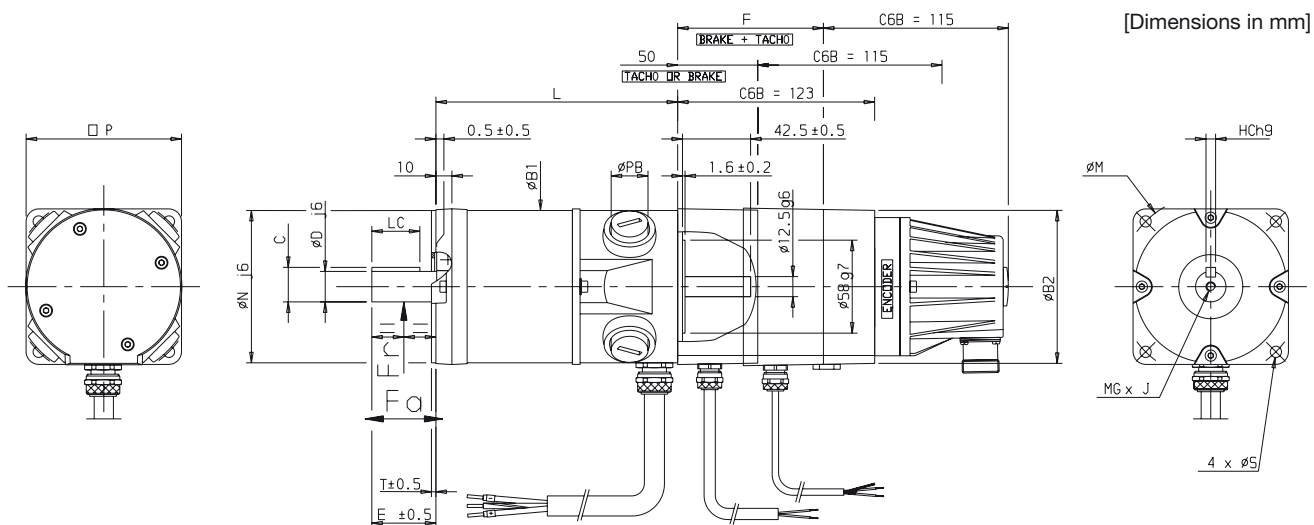
⁽¹⁾ Fr and Fa not cumulative

DC Servo Motors
RS Series

RS5 and RS6 with brake, tacho and encoder dimensions																			
Motor	P	N	C	D	LC	E	T	B1	PB	L	F	B2	S	M	MGxJ	HC	Weight [kg]	Fr ⁽¹⁾ [daN]	Fa ⁽¹⁾ [daN]
RS510	97	95	21.5	19	30	40	3	96	25	151	91	96	7	115	M6x18	6	5.1	70	23
RS520	97	95	21.5	19	30	40	3	96	25	180	91	96	7	115	M6x18	6	6.3	70	23
RS530	97	95	21.5	19	30	40	3	96	25	209	91	96	7	115	M6x18	6	7.5	70	23
RS540	97	95	21.5	19	30	40	3	96	25	238	91	96	7	115	M6x18	6	8.7	70	23
RS620	120	110	27	24	40	50	3.5	117	30	246	93	117	10	130	M8x20	8	11.5	80	26
RS630	120	110	27	24	40	50	3.5	117	30	284	93	117	10	130	M8x20	8	14	80	26
RS640	120	110	27	24	40	50	3.5	117	30	321	93	117	10	130	M8x20	8	16.3	80	26

⁽¹⁾ Fr and Fa not cumulative

DC Servo Motors
RS Series



Options

Tachometers and brakes						
Motors	Tachometer		Brakes [Voltage 24 VDC +/- 10 %]			
	Model	EMF [V/1000 min ⁻¹]	Holding torque [Nm]		Inertia [kgmm ²]	Weight [kg]
			20 °C	100 °C		
RS1	TBN 103	3	-	-	-	-
RS2	TBN 206	6	0.6	0.55	2	0.2
RS3	TBN 206	6	1.5	1.4	10	0.18
RS4	TBN 206	6	1.5	1.4	10	0.18
RS5	TBN 306	6	6	5.5	53	0.45
RS6	TBN 306	6	12	11.5	157	0.9

Encoders					
Model	Associated motors	Pulse per rev	Encoder reference	Mounting kit reference	Connector reference
C2	RS1	500	220215P0002	220071R0025	
	RS1	1000	220215P0012	220071R0025	
	RS2 / RS3 / RS4	500	220215P0001	220071R0025	
	RS2 / RS3 / RS4	1000	220215P0004	220071R0025	
C6	RS5 / RS6	500	220024P0001	220071R0002	220065R4621
	RS5 / RS6	1000	220024P0003	220071R0002	220065R4621
	RS5 / RS6	2000	220024P0006	220071R0002	220065R4621
	RS5 / RS6	5000	220024P0005	220071R0002	220065R4621
C6B	RS5 / RS6	500	220031R0001	220071R0004	220065R4621
	RS5 / RS6	1000	220031R0003	220071R0004	220065R4621
	RS5 / RS6	2000	220031R0008	220071R0004	220065R4621
	RS5 / RS6	2500	220031R0004	220071R0004	220065R4621
	RS5 / RS6	5000	220031R0005	220071R0004	220065R4621

Order Code

RS Series

	1	2	3	4	5	6	7
Order example	RS	120	E	R	1	0	11

1	Motor type	
	RS	Motor with neodyme magnets
2	Motor size and length	
	120	
	130	see table "Technical data"
	320	
	...	
3	Winding	
	L	Depend of motor size, speed and voltage/current, see table "Technical data"
	H	
	M	
	...	
4	Fix code	
	R	
5	Mechanical features	
	1	Output cables (standard)
	2	Terminal box
	3	Motor with resolver
	5	Special motor
6	Options	
	0	No accessories (standard)
	1	Tacho
	2	Brake (RS2 to RS6)
	3	Tacho + brake (RS2 to RS6)
	4	Encoder adaptation ⁽¹⁾ (size 5 and 6 only)
	5	Tacho + Encoder adaptation (size 5 and 6 only)
	6	Brake + Encoder adaptation (size 5 and 6 only)
	7	Tacho + Brake + Encoder adaptation (size 5 and 6 only)
7	Customer specification	
	00	Standard catalogue definition - smooth shaft (size 1 -> 4) - shaft with key way (size 5-6)

⁽¹⁾ Encoder adaptation is standard for RS1, RS2, RS3 and RS4.

Low-Cost DC Servo Motor - RX Series

Overview

Description

The RX DC motors, combined with RTS drives, provide an economical solution for any servo applications. They are particularly suitable for low power systems in clean atmospheres.

Advantages

- Excellent price/performance ratio
- Very low torque modulation
- High quality construction
- Very long service life
- 2nd shaft end for tacho and encoder mounting
- Tacho and brake as option

Applications

- Factory Automation
- Life Science Diagnostic

Features

- **Shaft**
 - RX1 and RX3: Smooth full shaft
 - RX5 and RX6: Full keyed shaft
- **2nd Shaft end**
 - RX1 and RX3: possibility to mount standard tacho or encoder
 - RX5 and RX6: possibility to mount standard tacho, adaptation for encoder mounting in option
- **Output cables 1 m without connector**
- **Options**
 - Brake
 - Tachometer
 - Adaptation 2nd shaft end for encoder mounting (RX5 and RX6)



Technical Characteristics - Overview

Motor type	CC Motors with rare ferrite magnets
Protection degree	<ul style="list-style-type: none">• RX1 and RX3: IP40• RX5 and RX6: IP54
Insulation	Class F

Technical Data

Torque at low speed M_0 [Nm]	Permanent current at low speed I_0 [A]	Rated Voltage U [V]	Rated Speed N [min ⁻¹]	Rotor Inertia [kgmm ²]	Product Code			Typical combination
0.285 0.4	2.8 3.6	44.5 46	3000 3000	50 68	RX120LR1 RX130HR1	■ ■	00 00	RTS 3/10-40 M RTS 10/20-60 ⁽¹⁾
1.08 1.54	7.8 9.4	54 59	3000 2900	500 720	RX320ER1 RX330CR1	■ ■	00 00	RTS 10/20-60 ⁽¹⁾ RTS 10/20-60 ⁽¹⁾
2.7 3.7	7.7 10.3	119 116	2800 2700	1280 1740	RX520KR1 RX530FR1	■ ■	00 00	RTS 12/24-130 T RTS 12/24-130 T
5 7.8	10.5 16	134 134	2400 2400	3500 5000	RX620JR1 RX630ER1	■ ■	00 00	RTS 12/24-130 T RTS 20/40-130 T

⁽¹⁾ M = single phase or T = three phase

Options

Tachometers and brakes						
Motors	Tachometer		Brakes [Voltage 24 VDC +/- 10 %]			
	Model	EMF [V/1000 min ⁻¹]	Holding torque [Nm]		Inertia [kgmm ²]	Weight [kg]
			20 °C	100 °C		
RX1	TBN 206	6	1	0.9	10	0.4
RX3	TBN 206	6	1.5	1.4	10	0.18
RX5	TBN 306	6	6	5.5	53	0.45
RX6	TBN 306	6	12	11.5	157	0.9

Encoders					
Model	Associated Motors	Pulse per rev	Encoder Reference	Mounting kit Reference	Connector Reference
C 2	RX1 / RX3	500	220215P0001	220071R0025	-
	RX1 / RX3	1000	220215P0004	220071R0025	-
C 6	RX5 / RX6	500	220024P0001	220071R0002	220065R4621
	RX5 / RX6	1000	220024P0003	220071R0002	220065R4621
	RX5 / RX6	2000	220024P0006	220071R0002	220065R4621
	RX5 / RX6	5000	220024P0005	220071R0002	220065R4621
C 6 B	RX5 / RX6	500	220031R0001	220071R0004	220065R4621
	RX5 / RX6	1000	220031R0003	220071R0004	220065R4621
	RX5 / RX6	2000	220031R0008	220071R0004	220065R4621
	RX5 / RX6	2500	220031R0004	220071R0004	220065R4621
	RX5 / RX6	5000	220031R0005	220071R0004	-

Order Code

RX Series

	1	2	3	4	5	6	7
Order example	RX	120	E	R	1	0	11

1	Motor type	
	RX	Motor with ferrite magnets
2	Motor size and length	
	120	
	130	see table "Technical data"
	320	
	...	
3	Winding	
	L	Depend of motor size, speed and voltage/current, see table "Technical data"
	H	
	M	
	...	
4	Fix code	
	R	
5	Mechanical features	
	1	Output cables (standard)
	2	Terminal box
	3	Motor with resolver
	5	Special motor
6	Options	
	0	No accessories (standard)
	1	Tacho
	2	Brake (RX3, RX5, RX6)
	3	Tacho + brake (RX3, RX5, RX6)
	4	Encoder adaptation ⁽¹⁾ (size 5 and 6 only)
	5	Tacho + Encoder adaptation (size 5 and 6 only)
	6	Brake + Encoder adaptation (size 5 and 6 only)
	7	Tacho + Brake + Encoder adaptation (size 5 and 6 only)
7	Customer specification	
	00	Standard catalogue definition - smooth shaft (size 1 -> 4) - shaft with key way (size 5-6)

⁽¹⁾ Encoder adaptation is standard for RX1 and RX3.

Pancake DC Servo Motor - AXEM Series

Overview

Description

The AXEM motor, with more than 2 million units produced, is one of the most widespread servo motors in the world. With its disk rotor, composed solely of copper and insulator the Axem motor achieves high dynamics and excellent regulation of motion at low speed, as well as silent and vibration-free functioning. It is robust, efficient, and low maintenance.

Advantages

- Very low speed modulation
- Exceptional regulation at low speed
- High dynamic characteristics
low rotor inertia
- Silent and vibration-free functioning
- Maintenance free
- Disk rotor
- Protection: IP44
IP20 for ventilated models
- Class F insulation

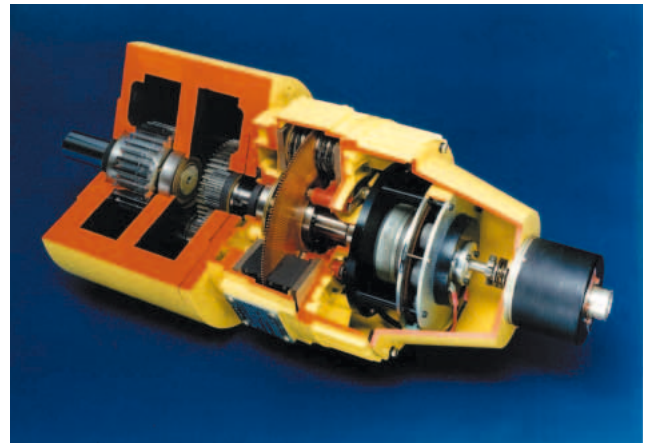
Applications

- Factory Automation
- Life Science Diagnostic



Technical Characteristics - Overview

Nominal torque	0.14 ... 19.2 Nm
Nominal current	6.4 ... 44 A
Nominal voltage	14 ... 178 V
Nominal speed	3 000, 4 800 min ⁻¹
Inertia	29 ... 7 400 kgmm ²



Technical Data

Motor	Nominal torque [Nm]	Nominal current [A]	Nominal voltage [V]	Nominal speed [min ⁻¹]	Inertia [kgmm ²]
F9M4R	0.14	6.4	22	4800	35
F9M2	0.282	11	14	3000	29
F9M4	0.346	6.7	26	3000	35
F9M4H	0.537	6.5	35	3000	34
F12M4R	0.42	8	37	4800	150
F12M2	0.61	11.7	24	3000	105
F12M4	0.77	7.7	43	3000	150
F12M4H	1.1	7.2	61	3000	160
MC13S	1.2	7.6	64	3000	235
MC17H	1.8	6.9	102	3000	790
MC17B	1.2	24	23.5	3200	790
MC19P	3.2	14.5	83	3000	1000
MC19P ⁽¹⁾	5.1	22.2	87	3000	1000
MC19S	3.2	7.3	165	3000	1000
MC19S ⁽¹⁾	5.1	11.1	171	3000	1000
MC19B	2.8	46	23.5	3000	1000
MC23S	6.1	13	170	3000	2300
MC23S ⁽¹⁾	10.5	21.8	178	3000	2300
MC24P	7.3	18.9	136	3000	3200
MC24P ⁽¹⁾	14.3	36	142	3000	3200
MC27P	14.3	33	152	3000	7400
MC27P ⁽¹⁾	19.2	44	154	3000	7400

⁽¹⁾ Cooling by external fan 10 l/sec

Encoder					
Type	Associated motor	Pulse/rev.		Inertia [kgmm ²]	Weight [kg]
		standard	option		
C2	F	500 250	1000	0.1	0.035
C4	F	500	1000 2500	2.3	0.2
C6B	MC	500	1000 2500 5000	3	0.45

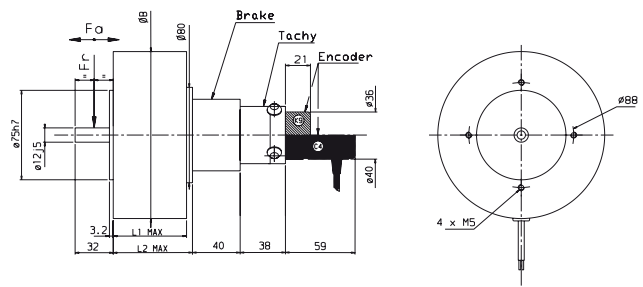
Tachy		
Type	Associated motor	EMF [V/1000 min ⁻¹]
F9T	F9	3
FC12T	F12 / MC	6
TBN 206	F9 / F12	6
TBN 420	MC	20

Brake (24 VDC ± 10%)				
Associated motor	Holding torque		Inertia [kgmm ²]	Weight [kg]
	Magnet brake [Nm]	Spring brake [Nm]		
F9 - F12	-	1.5	10	0.47
MC13	2	-	23	0.3
MC17 / MC19	5	-	65	0.6
MC23 / MC24	12	-	214	1.1
MC27	20	-	570	1.9
MC17	-	4	25	1.4
MC19	-	8	70	1.9
MC23 / 24 / 27	-	16	135	2.8

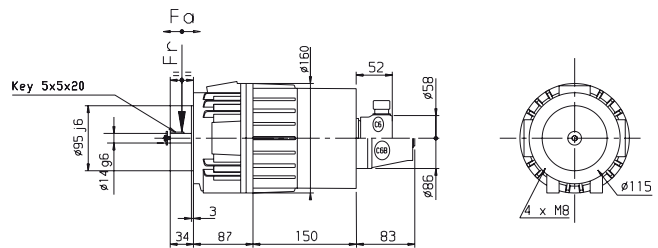
Dimensions

F9 - F12 dimensions					
Motor	L1 [mm]	L2 [mm]	Weight [kg]	Fr ⁽¹⁾ [daN]	Fa ⁽¹⁾ [daN]
F9M4R	34	46.5	1.1	14	2.5
F9M2	52.5	65	2.3	14	2.5
F9M4	52.5	65	2.3	14	2.5
F9M4H	64	76.5	2.8	14	2.5
F12M4R	37.5	51	2.9	14	2.5
F12M2	61.5	71.5	3.85	14	2.5
F12M4	61.5	71.5	3.85	14	2.5
F12M4H	74	84	5	14	2.5

F9: $\phi B = \phi 110$
F12: $\phi B = \phi 140$

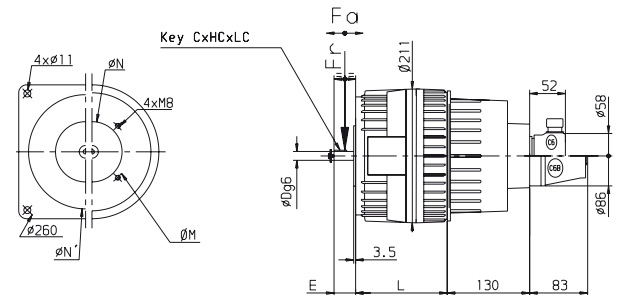


MC13 dimensions			
Motor	Weight [kg]	Fr ⁽¹⁾ [daN]	Fa ⁽¹⁾ [daN]
MC13	4	35	13



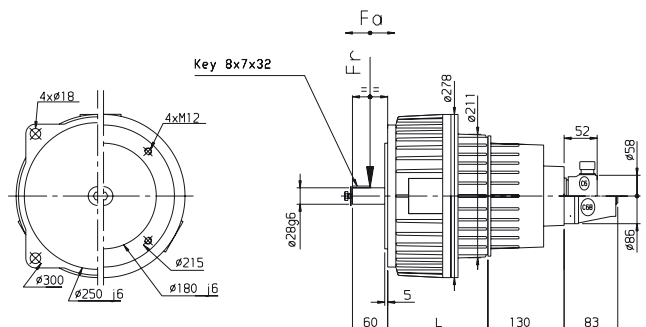
MC17 - MC19 dimensions								
Motor	M [mm]	N [mm]	N ⁽¹⁾ [mm]	E [mm]	L [mm]	Weight [kg]	Fr ⁽¹⁾ [daN]	Fa ⁽¹⁾ [daN]
MC17	115	95	180	34	163	6.5	60	35
MC19	165	130	130	50	163	9.7	60	35

MC17: C x HC x LC = 5 x 5 x 20
MC19: C x HC x LC = 8 x 7 x 32



MC23 - MC24 - MC27 Dimensions					
Motor	L [mm]	B [mm]	Weight [kg]	Fr ⁽¹⁾ [daN]	Fa ⁽¹⁾ [daN]
MC23	173	278	17	75	40
MC24	185	278	23	80	45
MC27	198	316	35	90	50

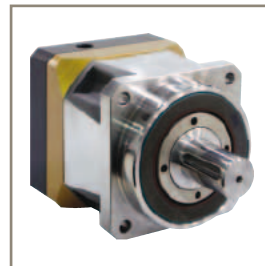
Dimensions including brake, tachy and encoder
(¹) Fr and Fa not cumulative



Planetary Gearboxes

Precision Gearboxes PS / RS Series

Economic Gearboxes PE Series



PR / RS



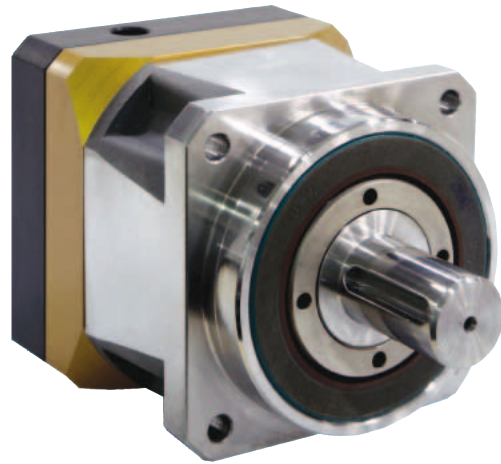
PE

Precision Planetary Gearboxes PS / RS Series

Overview

Description

The Helical Planetary Gearboxes incorporate design enhancements to provide superior performance for the most demanding high performance applications. The PS / RS gearboxes incorporate dual angular contact bearings providing higher radial load capacities while maintaining high input speeds. The design enhancements comprise among others, needle bearings to ensure a longer lifetime. Internal design changes and optimized gearing geometries provide the basis for the universal mounting position. Common mounting kits across multiple gear head lines promote quicker deliveries and ease of mounting to any servo motor. Mounting to any servo motor is as easy as A-B-C (adapter, bushing, collet).



Features

- **Higher radial load capacity:**
Angular contact output bearings
- **Increased service life:**
Needle bearings
- **Life time lubrication**
- **Universal Mounting Kits:**
Quicker deliveries and easier mounting
- **High nominal torque and low backlash:**
Helical planetary gearing
- **High stiffness:** Integrated planetary gear head
- **High wear resistance:**
Plasma Nitriding heat treating

Technical Characteristics - Overview

Series	Unit	PS	RS
Gear geometry		Helical Planetary	Helical Planetary/ Spur Bevel
Type		In-Line	Right Angle
Frame sizes	[mm]	60...115	
Maximum input speed	[min ⁻¹]	up to 6000	
Nominal torque	[Nm]	27...230	13...220
Radial force	[N]	>7500	
Life	[h]	20 000	
Backlash	[arcmin]	up to <3	up to <4

PS Series: In - Line Gearboxes

Technical Characteristics

Parameter	Unit	Ratio ⁽⁸⁾	PS60	PS90	PS115
Nominal output torque ⁽¹⁾ $T_{nom r}$	[Nm]	3 , 15, 30	27	76	172
		4, 5 , 7, 20 , 25, 40, 50 , 70	37	110	230
		10 , 100	32	93	205
Maximum acceleration torque $T_{acc r}$	[Nm]	3 , 15, 30	34	105	225
		4, 5 , 7, 20 , 25, 40, 50 , 70	48	123	285
		10 , 100	37	112	240
Emergency stop output torque ⁽²⁾ $T_{em r}$	[Nm]	3 , 15, 30	80	260	600
		4, 5 , 7, 20 , 25, 40, 50 , 70	70	230	500
		10 , 100	60	200	430
Nominal drive speed $N_{nom r}$	[min ⁻¹]	3	3000	2500	2000
		4, 5	3500	3000	2500
		7, 10 , 15	4000	3500	3000
		20 , 25, 30	4500	4000	3500
		40, 50	4800	4400	3800
		70, 100	5200	4800	4200
Maximum input speed $N_{max r}$ ⁽³⁾	[min ⁻¹]	3...100	6000	5500	4500
Maximum radial force P_{rmax} ⁽⁴⁾	[N]		1650	4800	7500
Maximum axial load P_{amax} ⁽⁵⁾	[N]		2100	3600	6800
Life	[h]		20 000 (lifetime lubrication)		
Backlash - standard ⁽⁶⁾	[arcmin]	3...10 (1 step)	<6	<6	<4
		15...100 (2 step)	<8	<8	<6
Backlash - reduced ⁽⁶⁾	[arcmin]	3...10 (1 step)	<4	<4	<3
		15...100 (2 step)	<6	<6	<5
Efficiency at nominal torque	%	3...10	97	97	97
		15...100	94	94	94
Noise level at 3000 min⁻¹ ⁽⁷⁾	[db]	3...100	<62	<62	<65
Torsional rigidity	[Nm/arcmin]	3...100	3	12	27
Operating temperature	[°C]	3...100	-20...90		
Lubrication		3...100	per maintenance schedule		
Orientation		3...100	any		
Direction of Rotation		3...100	same as input		
Enclosure rating			IP65		
Rotor inertia			see page 230		
Weight	[kg]	3...10	1.3	3.0	7.0
		15...100	1.7	5.0	10.0

⁽¹⁾ At nominal speed $N_{nom r}$.

⁽²⁾ Maximum of 1000 stops.

⁽³⁾ Cycle mode.

⁽⁴⁾ Max. radial load applied to the center of the shaft at 100 min⁻¹

⁽⁵⁾ Max. axial load at 100 min⁻¹.

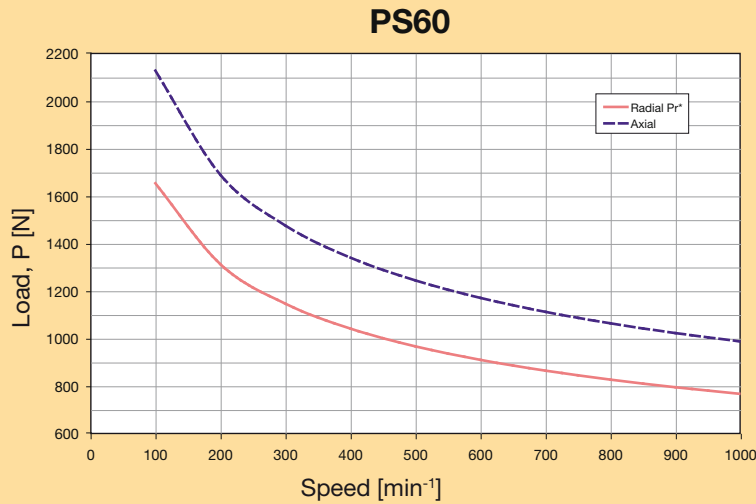
⁽⁶⁾ Measured at 2 % of rated torque.

⁽⁷⁾ Measure at 1 m.

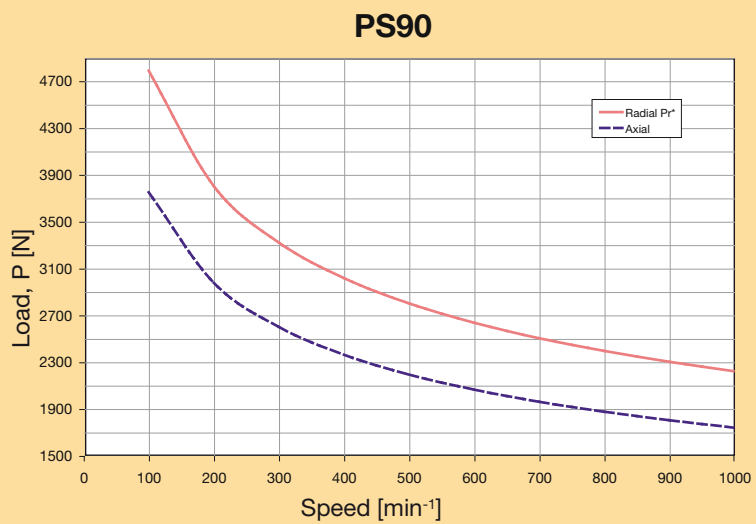
⁽⁸⁾ Gearboxes in bold print - ratios with standard reversing play are on stock.

Load on Input Shaft

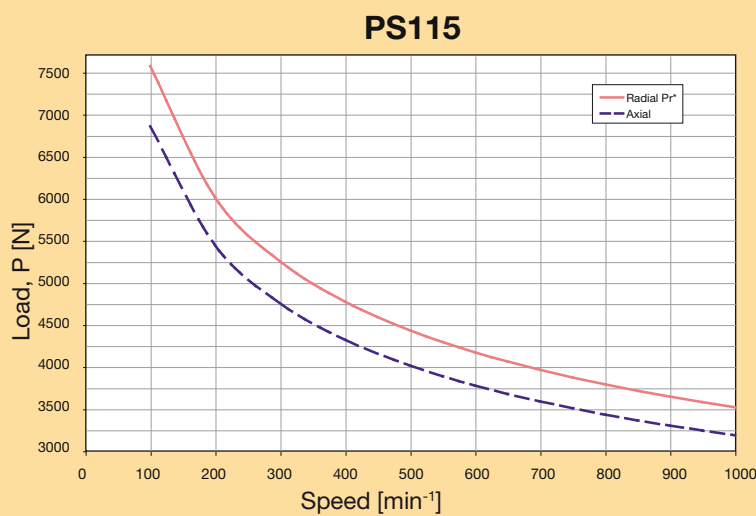
Formulas to calculate radial load (P_{rx}) at any distance "X" from the gearbox mounting surface:



$$P_{rx} = P_r * 75 \text{ mm} / (49 \text{ mm} + X)$$



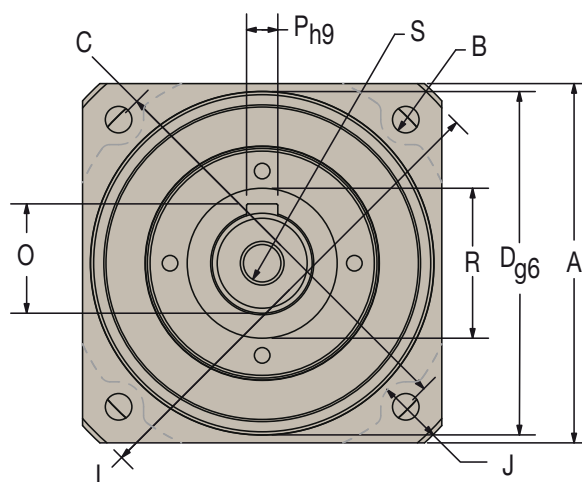
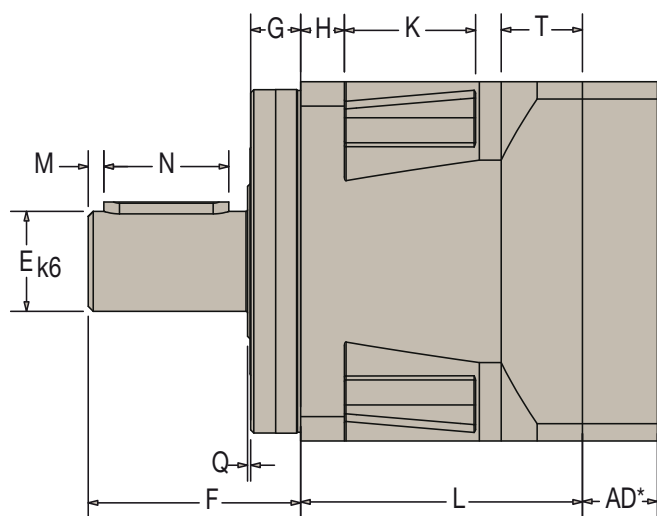
$$P_{rx} = P_r * 96 \text{ mm} / (62 \text{ mm} + X)$$



$$P_{rx} = P_r * 124 \text{ mm} / (81 \text{ mm} + X)$$

* Radial load applied to center of the shaft.

Dimensions



AD*: see table "Universal Mounting Kits"

Frame size	All dimensions in mm	PS60	PS90	PS115
A	Flange cross section	62	90	115
B	Fixing bore	5.5	6.5	8.5
C	Bolt circle	70	100	130
D	Motor pilot Ø	50	80	110
E	Drive shaft Ø	16	22	32
F	Drive shaft length	40	52	68
G	Motor pilot depth	11	15	16
H	Flange width	8	10	14
I	Ø Housing	80	116	152
J	Housing recess	5	6.5	7.5
K	Recess length	24	33	42
L1	Length single stage	59.8	69.5	90.2
L2	Length double stage	94.8	113	143.4
M	Distance from shaft end	2	3	5
N	Keyway length	25	32	40
O	Key height	18	24.5	35
P	Keyway width	5	6	10
Q	Collar height	1	1	1.5
R	Collar Ø	22	35	50
S	Center bore (shaft end)	M5x8	M8x16	M12x25
T	Width of flange on output side	20.5	20	26

Universal Mounting Kits

Adapter length "AD" dimension

Frame size	Motor shaft length [mm]	Gearbox adapter length [mm]
60	16...35	16.5
	35.1...41	22.5
90	20...40	20
	40.1...48	28.5
115	22...50	24
	50.1...61	35

PS: Rotor Inertia

All rotor inertias refer to the gearbox input

Ratio	Unit	PS60	PS90	PS115
3	[kgmm ²]	25	97	340
4	[kgmm ²]	17	67	220
5	[kgmm ²]	15	51	170
7	[kgmm ²]	14	41	130
10	[kgmm ²]	14	37	110
15	[kgmm ²]	15	52	170
20	[kgmm ²]	15	51	170
25	[kgmm ²]	15	51	170
30, 40, 50, 70, 100	[kgmm ²]	13	37	110

RS Series: Right - Angle Gearboxes

Technical Characteristics

Parameter	Unit	Ratio	RS60	RS90	RS115
Nominal output torque ⁽¹⁾ $T_{nom r}$	[Nm]	5	13	55	85
		10	24	80	160
		15, 20, 25, 50	35	88	220
		30, 40, 100	30	86	195
Maximum acceleration torque $T_{acc r}$	[Nm]	5	19	83	127
		10	36	120	240
		15, 20, 25, 50	45	123	255
		30, 40, 100	37	112	240
Emergency stop output torque ⁽²⁾ $T_{em r}$	[Nm]	5	40	150	270
		10	72	240	480
		15, 20, 25, 50	80	250	510
		30, 40, 100	60	200	430
Nominal drive speed $N_{nom r}$	[min ⁻¹]	5, 10	3200	2800	2400
		15, 20, 25, 30, 40	3700	3300	2900
		50, 100	4200	3800	3400
Maximum input speed $N_{max r}$ ⁽³⁾	[min ⁻¹]	5...100	6000	5300	4500
Maximum radial force $P_{r max}$ ⁽⁴⁾	[N]		1650	4800	7500
Maximum axial load $P_{a max}$ ⁽⁵⁾	[N]		2100	3600	6800
Life	[h]		20 000 (lifetime lubrication)		
Backlash - standard ⁽⁶⁾	[arcmin]	5...10 (1 step)	<14	<12	<12
		15...100 (2 step)	<12	<10	<10
Backlash - reduced ⁽⁶⁾	[arcmin]	5...10 (1 step)	<10	<8	<8
		15...100 (2 step)	<8	<6	<6
Efficiency at nominal torque	%	5...10	94	94	94
Noise level at 3000 min⁻¹ ⁽⁷⁾	[db]	5...100	<65	<68	<68
Torsional rigidity	[Nm/arcmin]	5...100	2.5	10	22
Operating temperature	[°C]	5...100	-20...90		
Lubrication		5...100	per maintenance schedule		
Orientation		5...100	any, details see ordering information		
Direction of Rotation		3...100	Direction turns		
Enclosure rating			IP65		
Rotor inertia			see page 233		
Weight	[kg]	5...10	2.0	6.0	11.0

(1) At nominal speed $N_{nom r}$.

(2) Maximum of 1000 stops.

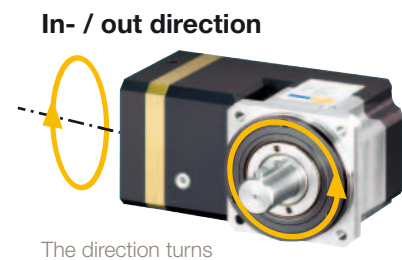
(3) Cycle mode.

(4) Max. radial load applied to the center of the shaft at 100 min⁻¹

(5) Max. axial load at 100 min⁻¹.

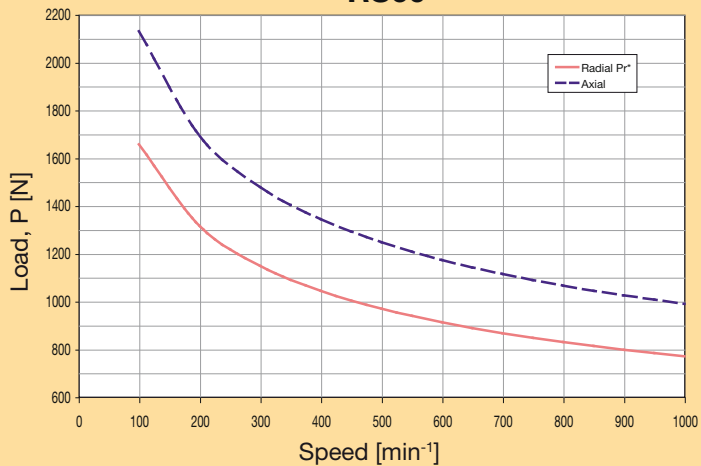
(6) Measured at 2 % of rated torque.

(7) Measure at 1 m.



Load on Input shaft

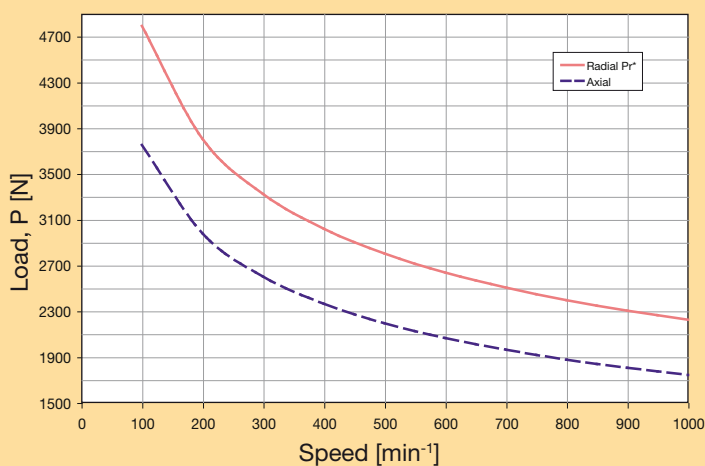
RS60



Formulas to calculate radial load (Prx) at any distance "X" from the gearbox mounting surface:

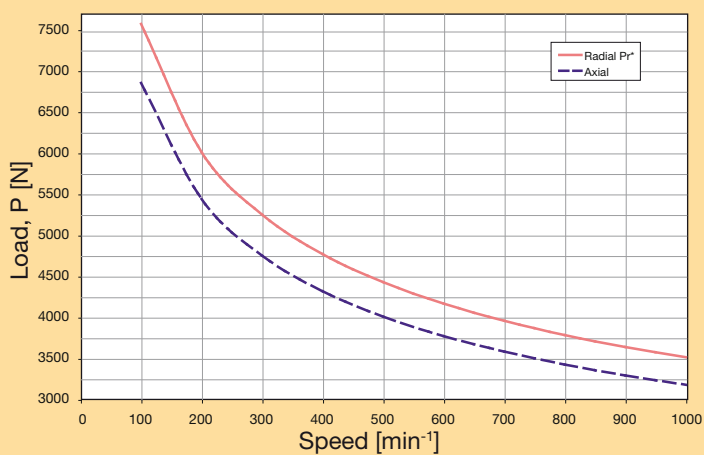
$$Pr_x = Pr * 75 \text{ mm} / (49 \text{ mm} + X)$$

RS90



$$Pr_x = Pr * 96 \text{ mm} / (62 \text{ mm} + X)$$

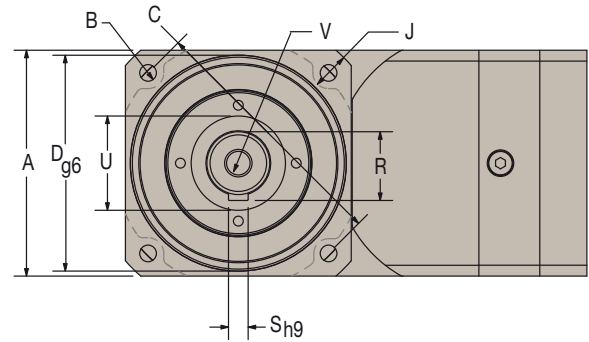
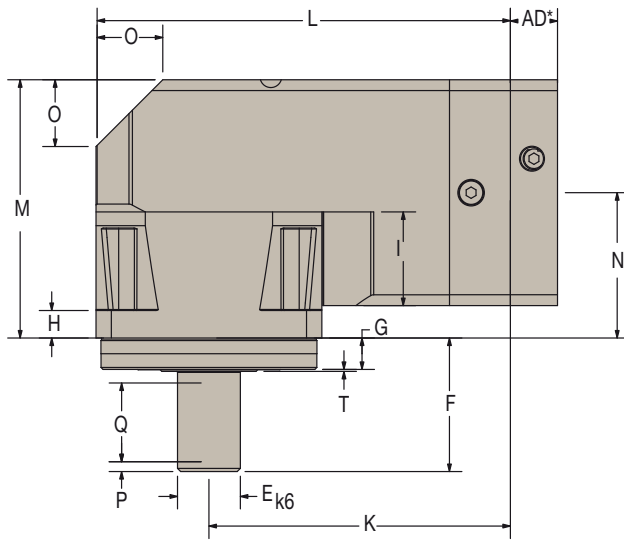
RS115



$$Pr_x = Pr * 124 \text{ mm} / (81 \text{ mm} + X)$$

* Radial load applied to center of the shaft.

Dimensions



AD*: see table "Universal Mounting Kits"

Frame size	All dimensions in mm	RS60	RS90	RS115
A	Flange cross section	62	90	115
B	Mounting bore	5.5	6.5	8.5
C	Bolt circle	70	100	130
D	Motor pilot Ø	50	80	110
E	Input shaftØ	16	22	32
F	Length of input shaft	40	52	68
G	Motor pilot depth	11	15	16
H	Flange width	8	10	14
I	Enclosure recess	23.5	40.5	47.5
J	Recess length	5	6.5	7.5
K	Distance to output centerline	93.7	132	153.5
L	Housing length	124.7	177	211
M	Housing width	76.8	103	132
N	Distance to input centerline	47	58	74
O	Bevel height	14	25	32
P	Distance from shaft end	2	3	5
Q	Keyway length	25	32	40
R	Key height	18	24.5	35
S	Keyway width	5	6	10
T	Collar height	0.5	0.5	1
U	Collar Ø	22	35	45
V	Center bore (shaft end)	M5x8	M8x16	M12x25

Universal Mounting Kits

Adapter length "AD" dimension

Frame size	Motor shaft length [mm]	Gearbox adapter length [mm]
60	16...35	16.5
	35.1...41	22.5
90	20...40	20
	40.1...48	28.5
115	22...50	24
	50.1...61	35

RS: Rotor Inertia

All rotor inertias refer to the gearbox input

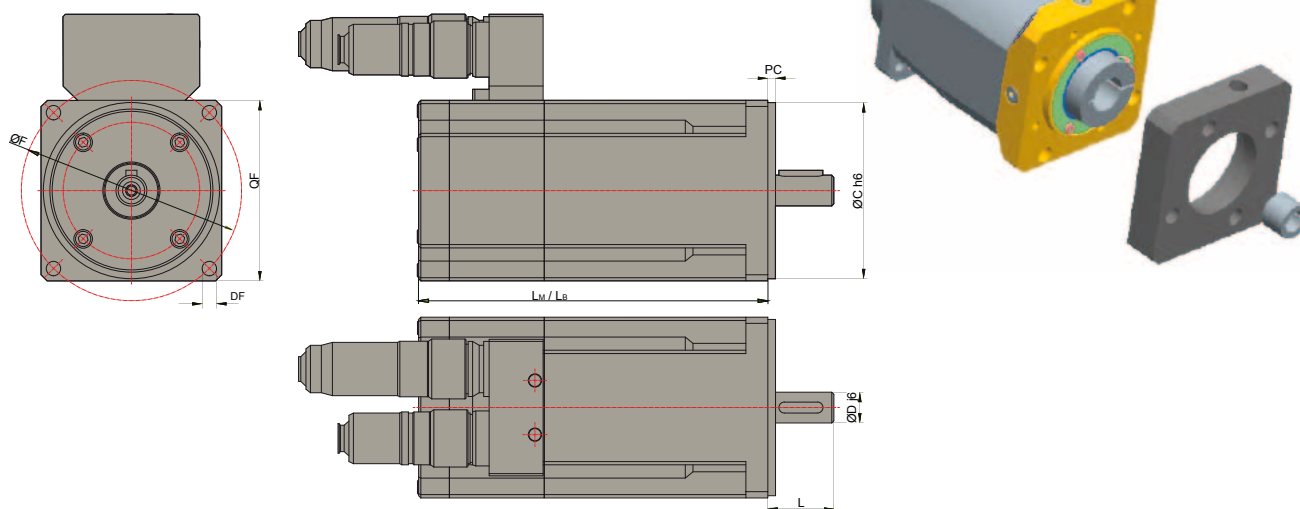
Ratio	Unit	RS60	RS90	RS115
5	[kgmm ²]	22	81	250
10	[kgmm ²]	19	61	190
15	[kgmm ²]	18	60	170
20	[kgmm ²]	17	51	140
25	[kgmm ²]	16	42	130
30	[kgmm ²]	18	60	170
40	[kgmm ²]	17	51	140
50	[kgmm ²]	15	40	110
100	[kgmm ²]	15	40	110

Adapter Flange / Motor - Dimensions (Gear Unit Input Side)

Dimensions [mm]

Motor ⁽¹⁾	Flange Type	Motor flange	Flange depth	Bolt circle Ø	Bore Ø	Pilot Ø	Pilot depth	Shaft Ø	Shaft length	Adapter flange		
		QF	PC	F	DF	C	S	D	L	Order No.	Fastening thread	AD ⁽²⁾ (short)
SM_60,###,##,5,11,S	B5	70	7	75	6	60	2.5	11	23	MU60-001	M5	16.5
M_70,###,##,5,11,S	B5	70	7	75	6	60	2.5	11	23	MU60-001	M5	16.5
NX3		56	8.5	75	5.5	60	2.5	11	23	MU60-001	M5	16.5
M_56,###,##,5,9,S	B5	56	6.5	63	5.5	40	2.5	9	20	MU60-003	M5	16.5
SM_60,###,##,8,9,S	B5	60	7	63	5.5	40	2.5	9	20	MU60-003	M5	16.5
SY56#	Nema23	56.5	4.83	66.67	5.3	38.1	1.6	6.35	25.4	MU60-005	M5	16.5
M_56,###,##,5,11,S	B5	56	6.5	63	5.5	40	2.5	11	23	MU60-254	M5	16.5
NX2		56	7.2-18	63	5.5	40	2.5	11	25	MU60-254	M5	16.5
NX1		42.5	6	50	3.2	30	2.5	9	25	MU60-255	M3	16.5
SM_82,###,##,8,14,S	B8	82	10	100	6.5	80	3.5	14	30	MU60-321	M6	16.5
SM_82,###,##,8,14,S	B8	82	10	100	6.5	80	3.5	14	30	MU90-001	M6	20
SM_82,###,##,8,19,S	B8	82	10	100	6.5	80	3.5	19	40	MU90-085	M6	20
NX4		91.5	10.5	100	7	80	3	19	40	MU90-085	M6	20
M_105,###,##,5,19,S	B5	105	10	115	9.5	95	3.5	19	40	MU90-088	M9	20
SM_100,###,##,5,19,S	B5	100	10	115	9	95	3.5	19	40	MU90-088	M8	20
SM_115,###,##,8,19,S	B8	115	10	130	9	95	3.5	19	40	MU90-345	M8	20
M_105,###,##,5,24,S	B5	105	10	115	9.5	95	3.5	24	50	MU115-005	M8	24
SM_100,###,##,5,24,S	B5	100	10	115	9	95	3.5	24	50	MU115-005	M8	24
SM_115,###,##,8,19,S	B8	115	10	130	9	95	3.5	19	40	MU115-006	M8	24
M_105,###,##,6,24,S	B6	105	10	130	9	110	3.5	24	50	MU115-010	M8	24
SM_115,###,##,7,24,S	B7	130	10	130	9	110	3.5	24	50	MU115-010	M8	24
NX6		121	10.5	130	9	110	3.5	24	50	MU115-010	M8	24
SM_82,###,##,8,14,S	B8	82	10	100	6.5	80	3.5	14	30	MU115-015	M6	24
SM_115,###,##,5,24,S	B5	145	10	165	11	130	3.5	24	50	MU115-026	M10	24
SM_142,###,##,5,24,S	B5	145	10	165	11	130	3.5	24	50	MU115-026	M10	24
SM_82,###,##,5,19,S	B5	100	10	115	9	95	3.5	19	40	MU115-039	M8	24
SM_100,###,##,5,19,S	B5	100	10	115	9	95	3.5	19	40	MU115-039	M8	24
SM_82,###,##,8,19,S	B8	82	10	100	6.5	80	3.5	19	40	MU115-089	M6	24
SM_115,###,##,8,24,S	B8	115	10	130	9	95	3.5	24	50	MU115-257	M8	24
M_105,###,##,9,24,S	B9	96	10	100	7	80	3.5	24	50	MU115-269	M6	24

⁽¹⁾ MB/SMB: for drives TPDM, SLVDN, TwinN, SPDN, HiDrive
MH/SMH: for drive Compax3
⁽²⁾ AD: Adapter length (please refer to the "dimensions" chapter)



Gearbox Sizing

Parker has prepared the following procedure to provide a quick method for selecting a gearbox.

1) Application parameters:

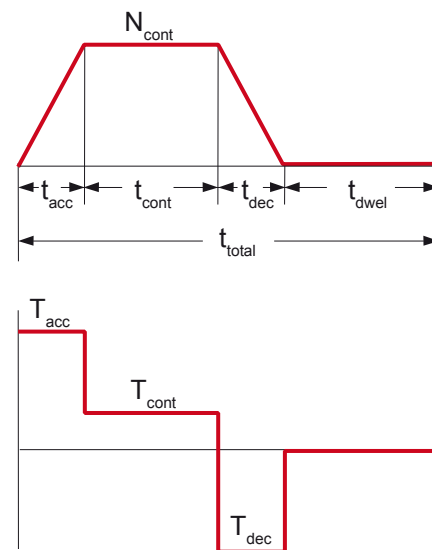
- Acceleration time (t_{acc})
- Continuous run time (t_{cont})
- Deceleration time (t_{dec})
- Dwell time (t_{dwell})
- Acceleration torque (T_{acc})
- Continuous torque (T_{cont})
- Deceleration torque (T_{dec})
- Application speed (N_{cont})
- Transmission ratio (i)
- Gearbox nominal torque ($T_{nom r}$)
- Max. permissible acceleration torque ($T_{acc r}$)
- Percentage of acceleration torque vs. continuous cycle time (t_{total})
- Max. input speed ($N_{max r}$)

2) Duty cycle:

$$\text{Duty cycle} = t_{acc} + t_{cont} + t_{dec} / t_{total} \times 100 \%$$

If duty cycle is <60 % and ($t_{acc} + t_{cont} + t_{dec}$) is less than 20 minutes, the motion is considered to be intermittent.

If duty cycle is <60 % and ($t_{acc} + t_{cont} + t_{dec}$) is more than 20 minutes, the motion is considered to be continuous.



3) For Cycle mode applies:

Determine T_{acc} % of ($T_{acc} + T_{cont} + T_{dec}$):
 $T_{acc} / (T_{acc} + T_{cont} + T_{dec}) \times 100\%$

Define the ratio: T_{cont} / T_{acc}

Use the table to select the load factor K.

Compare Accel/Decel torque to the maximum permissible accel torque of the gearbox $T_{acc r}$: $T_{acc} < T_{acc r} \times K$, if not, please select a more suitable gearbox.

Compare the required maximum speed to the maximum rated speed of the gearbox.

$$N_{max} < N_{max r / i} \text{ (i-gearbox ratio)}$$

Table: Load Factor K

T_{acc} %	$0 < T_{cont} / T_{acc} < 0.25$	$0.25 < T_{cont} / T_{acc} < 0.5$
10-15	1.0	1.0
15-20	1.0	0.95
20-25	0.94	0.89
25-30	0.88	0.84
30-35	0.81	0.79
35-40	0.76	0.75
40-45	0.71	0.70
45-50	0.66	0.66

4) For continuous operation applies:

$$T_{nom} < T_{nom r}$$

$$N_{nom} < N_{nom r} / i$$

5) Check the Emergency Stop Torque Rating.

6) Verify Radial and Axial Shaft Load of the Application for the selected Gearbox.

Order Code

PS / RS Gearboxes

	1	2		3		4	5		6
Order example	PS	60	-	003	-	S	2	/	MU60-088

1 Gearbox type

- **PS** Gearbox for in-line mounting
- **RS** Right-angle gearboxes

2

- **60** Flange 60
- **90** Flange 90
- **115** Flange 1150

3 Ratio

	i	PS	RS
003	3	● x	
004	4	x	
005	5	● x	x
007	7	x	
010	10	● x	x
015	15	x	x
020	20	● x	x
025	25	x	x
030	30	x	x
040	40	x	x
050	50	● x	x
070	70	x	
100	100	x	x

4 Reverse play / orientation

- **S** Standard
- **L** Reduced

5 Series

- **2** Gen 2 Gearboxes

- **On stock, short delivery times**

6 Adapter flange / Motor assignment (Dimensions see next page)

- **MU60-001** SMH60,###,##,5,11,S
MH70,###,##,5,11,S
NX3
- **MU60-003** MH56,###,##,5,9,S
SMH60,###,##,8,9,S
- **MU60-005** SY56
- **MU60-254** MH56,###,##,5,11,S
NX2
- **MU60-255** NX1
- **MU60-321** SMH,###,###,8,14,S
- **MU90-001** SMH82,###,##,8,14,S
- **MU90-085** SMH82,###,##,8,19,S
NX4
- **MU90-088** MH105,###,##,5,19,S
SMH100,###,##,5,19,S
- **MU90-345** SMH115,###,##,8,19,S
- **MU115-005** MH105,###,##,5,24,S
SMH100,###,##,5,24,S
- **MU115-006** SMH115,###,##,8,19,S
- **MU115-010** MH105,###,##,6,24,S
SMH115,###,##,7,24,S
NX6
- **MU115-015** SMH82,###,##,8,14,S
- **MU115-026** SMH115,###,##,5,24,S
SMH142,###,##,5,24,S
- **MU115-039** SMH82,###,##,5,19,S
SMH100,###,##,5,19,S
- **MU115-089** SMH82,###,##,8,19,S
- **MU115-257** SMH115,###,##,8,24,S
- **MU115-269** MH105,###,##,9,24,S
- **MUxxx-yyy** Additional motors: Selection of the adapter flange on www.parker-eme.com/gear_kits

Economical Planetary Gearheads - PE

Overview

Description

The PLE is the perfect economy alternative to the PS gearbox. This planetary gearbox was especially designed for all applications where a considerably low backlash is not of vital importance.

Features

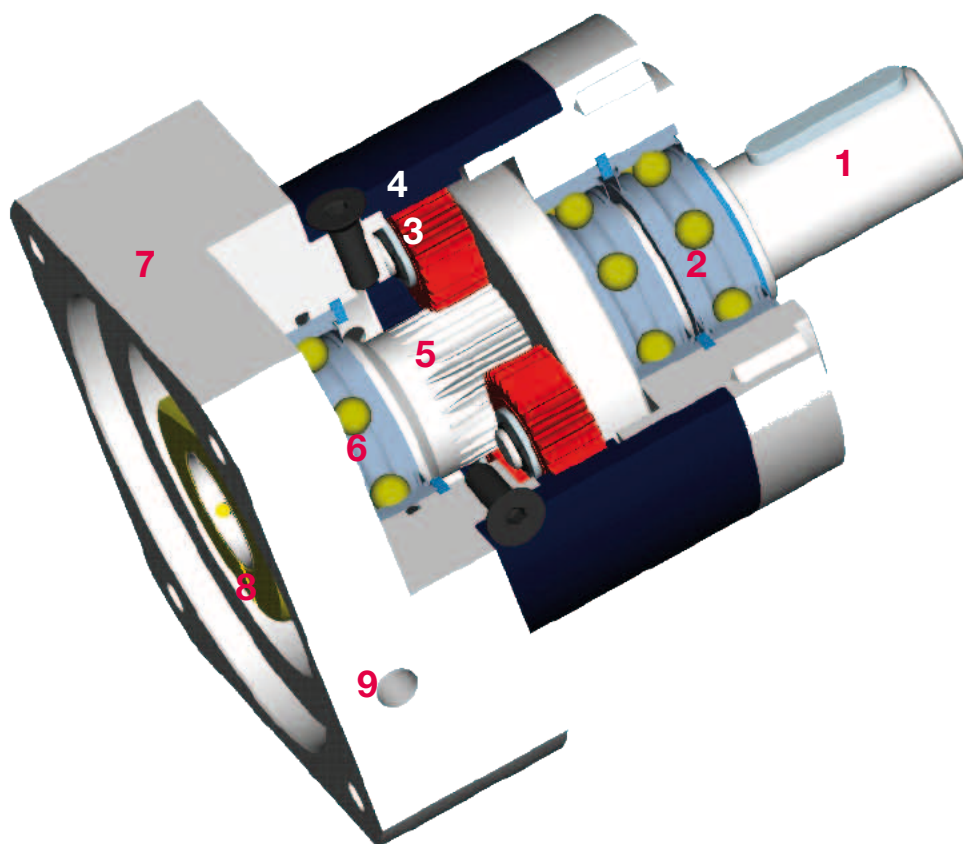
- Excellent price/performance ratio
- Input speeds up to 8000 min⁻¹
- Low backlash
- High output torques
- PCS-2 system
- High efficiency (96 %)
- 22 ratios $i=3...512$
- Low noise
- High quality (ISO 9001)
- Any fitting position possible
- Simple motor fitting
- Life time lubrication
- Direction of rotation equidirectional
- Balanced motor pinion



Technical Characteristics Overview

Features	Unit	Division
Geometry		Planetary Gearheads
Type		Inline
Drives sizes	[mm]	60, 90, 115
Maximum input speed	[min ⁻¹]	up to 13000
Nominal torque	[Nm]	260
Radial force	[N]	up to 2400
Service life	[h]	30000
Backlash	[arcmin]	< 8

Layout / Features



1 Output shaft

The input shaft is case-hardened and offers a very good torsional rigidity.

2 Output shaft bearing

Double ball bearings distribute the load evenly which results in a high radial and axial load bearing capacity.

3 Planet wheel

Case-hardened and precision ground.

4 Annulus gear in the housing

Case-hardened and precision ground.

5 Sun gear

Case-hardened and precision ground.

6 Sun gear bearing

The integral sun gear allows precise mounting within a few minutes. The inside of the gearhead is protected against contamination.

7 Mounting flanges

The gearheads are available with motor flanges for a variety of common servo and stepper motors.

8 Clamping bushing

Consists of clamp collar and clamp screw.

The proven clamped joint for the motor shaft with even pressure distribution ensures safe torque transmission even at high loads.

9 Fitting aperture

Easy access for tightening and loosening the clamped joint.

Technical Data

Parameter	Unit	Ratio	PE3	PE4	PE5	
Nominal torque $T_{nom r} /$ Maximum permissible acceleration torque $T_{acc r}$ $T_{nom r} / T_{acc r}$ (1)(2)(3)(4)	[Nm]	1 step	3	28/45	85/136	115/184
			4	38/61	115/184	155/248
			5	40/64	110/176	195/312
			8	18/29	50/80	120/192
		2 step	9	44/70	130/208	210/336
			12	44/70	120/192	260/416
			15	44/70	110/176	230/368
			16	44/70	120/192	260/416
			20	44/70	120/192	260/416
			25	40/64	110/176	230/368
			32	44/70	120/192	260/416
			40	40/64	110/176	230/368
		3 step	64	18/29	50/80	120/192
			60	44/70	110/176	260/416
			80	44/70	120/192	260/416
			100	44/70	120/192	260/416
			120	44/70	110/176	230/368
160	44/70		120/192	260/416		
200	40/64		110/176	230/368		
256	44/70		120/192	260/416		
320	40/64		110/176	230/368		
512	18/29		50/80	120/192		
Emergency off torque $T_{em r}$ ⁽⁵⁾	[Nm]	Double nominal torque $T_{nom r}$				
Nominal drive speed at 100 % $T_{nom r}$ $N_{nom r}$ ⁽⁶⁾	[min ⁻¹]	3	4450	2400	2550	
		4	4400	2300	2500	
		5	4500	2800	2500	
		8	4500	4000	3500	
		9	4500	2900	2650	
		12	4500	4000	2650	
		15	4500	3350	3200	
		16	4500	4000	3100	
		20...512	4500	4000	3500	
Maximum drive speed $N_{max r}$ ⁽⁶⁾	[min ⁻¹]	3...512	13 000	7000	6500	
Maximum radial force $P_{r max}$ ^{(1) (7)}	[N]		340	1700	2400	
Maximum axial force $P_{a max}$ ^{(1) (7)}	[N]		450	2000	2100	
Service life	[h]	30 000 (lifetime lubrication)				
Backlash	[arcmin]	(1 step)	< 12	< 8	< 8	
		(2 step)	< 15	< 12	< 12	
		(3 step)	< 18	< 14	< 14	

⁽¹⁾ the data refer to an output shaft speed of $n_2=100 \text{ min}^{-1}$ and application factor $KA=1$ as well as S1 operating mode for electrical machines and $T=30 \text{ °C}$

⁽²⁾ dependent on the respective motor shaft diameter

⁽³⁾ with keyway; for dynamic loads

⁽⁴⁾ permitted for 30 000 revolutions of the output shaft

⁽⁵⁾ permitted 1000 times

⁽⁶⁾ permitted operating temperatures may not be exceeded.

⁽⁷⁾ referred to the center of the output shaft

Parameter	Unit	Ratio	PE3	PE4	PE5	
Efficiency at nominal torque ⁽⁸⁾	%	(1 step)	96			
		(2 step)	94			
		(3 step)	90			
Noise level at 3000 min⁻¹ ⁽⁹⁾	[dB (A)]		58	60	65	
Torsional rigidity	[Nm/arcmin]	(1 step)	2.3	6	12	
		(2 step)	2.5	6.5	13	
		(3 step)	2.5	6.3	12	
Operating temperature ⁽¹⁰⁾	[°C]		-25 ... +90			
Lubrication			Lifetime lubrication			
Orientation			any			
Direction of Rotation			same as input			
Product Enclosure Rating			IP54			
Moment of inertia ⁽¹¹⁾	[kgmm ²]	1 step	3	13.5	77	263
			4	9.3	52	179
			5	7.8	45	153
			8	6.5	39	132
		2 step	9	13.1	74	262
			12	12.7	72	256
			15	7.7	71	253
			16	8.8	50	175
			20	7.5	44	150
			25	7.5	44	149
			32	6.4	39	130
			40	6.4	39	130
		3 step	64	6.4	39	130
			60	7.6	51	257
			80	7.5	50	150
			100	7.5	44	149
			120	6.4	70	250
			160	6.4	39	130
200	6.4		39	130		
256	6.4		39	130		
320	6.4	39	130			
512	6.4	39	130			
Weight	[kg]	(1 step)	0.9	3.2	6.6	
		(2 step)	1.1	3.7	8.6	
		(3 step)	1.3	4.2	10.6	

⁽⁸⁾ depends on the ratio, $n_2=100 \text{ min}^{-1}$

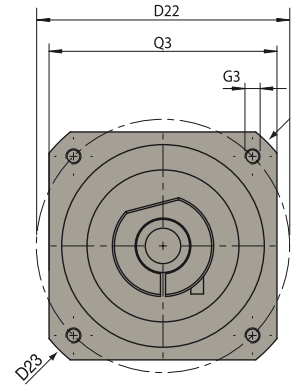
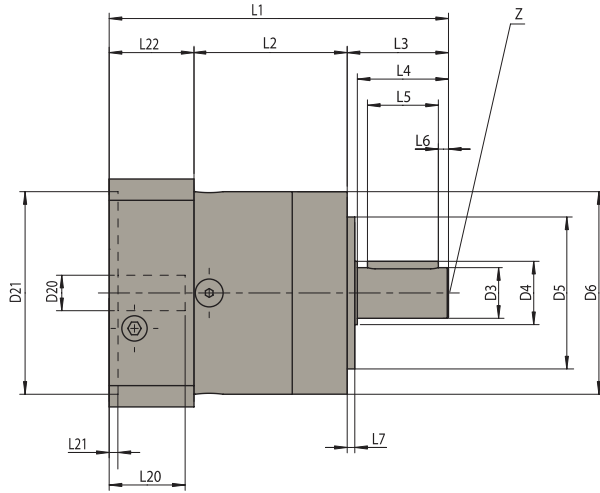
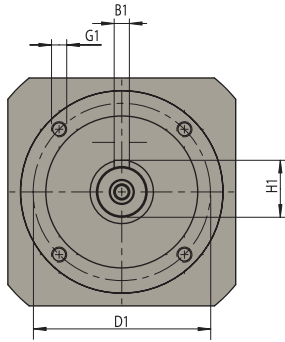
⁽⁹⁾ Noise level at a distance of 1 m; measured at a drive speed of $n_1=3000 \text{ min}^{-1}$ without load; $i=5$

⁽¹⁰⁾ referred to the center of the housing surface

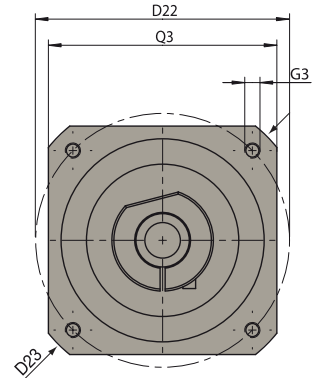
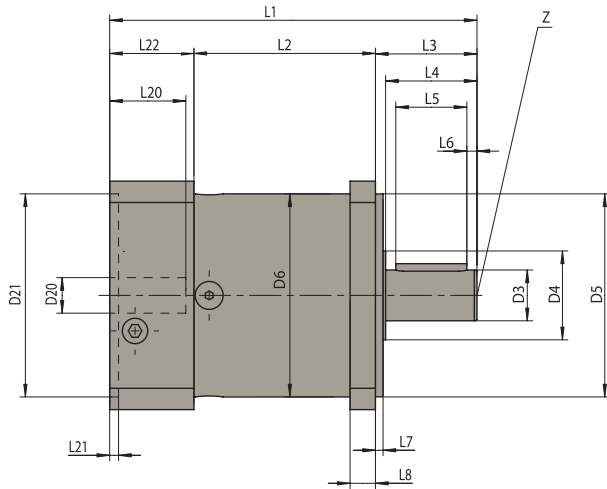
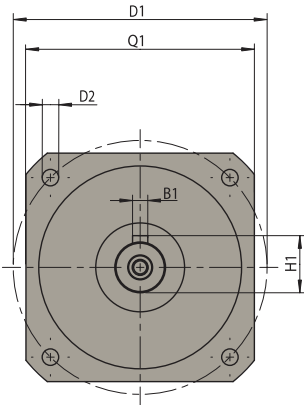
⁽¹¹⁾ Inertia refers to the input shaft and to the standard motor shaft diameter D20

Dimensions

PE3



PE4, PE5



Gearboxes
PE Series

		Frame size		
		PE3	PE4	PE5
All dimensions in mm				
B1	Keyway DIN 6885 T1	5	6	8
D1	Flange bolt circle	52	100	130
D2	Mounting bore	-	6.5	8.5
D3	Shaft diameter	14	20	25
D4	Shaft collar	17	35	35
D5	Centering	40	80	110
D6	Housing diameter	60	80	115
D20	Hole	9	14	19
D21	Centering diameter for motor	40	80	95
D22	Bolt circle	63	100	115
D23	Diagonal dimension	80	115	145
G1	Tapped hole x depth	M5x8	-	-
G3	Tapped hole x depth	Depending on the adapter flange (see table with the motor-gearbox combinations)		
H1	Keyway DIN 6885 T1	16	22.5	28

			Frame size		
			PE3	PE4	PE5
All dimensions in mm					
L1	Overall length	1 step	106.5	145	201.5
		2 step	119	162.5	229.5
		3 step	131.5	180	257
L2	Housing length	1 step	47	71.5	99
		2 step	59.5	89	127
		3 step	72	106.5	154.5
L3	Input shaft end		35	40	55
L4	Shaft end to collar		30	36	50
L5	Length of keyway		25	28	40
L6	Distance to shaft end		2.5	4	5
L7	Pilot		3	3	4
L8	Flange width		-	10	15
L20	Shaft length motor		23	30	40
L21	Centering drive		2.5	3.5	3.5
L22	Motor flange length		24.5	33.5	47.5
Q1	Flange cross section		-	90	115
Q3	Flange cross section		60	90	115
Z	Centering bore DIN332, sheet 2, form DR		M5x12	M6x16	M10x22

Order Code

PE Gearheads

	1	2	3	4	5	6	7	8	9
Order example	PE	3	003	10	M	038	063	06	20

1 Gearhead Type	PE	Economy planetary gearbox
2 Gearhead Size	3	PE3
	4	PE4
	5	PE5
3 Ratio	003	3
	...	
	512	512
4 Output shaft	10	Input shaft with keyway
5 Motor connection flange	M	
6 Pilot diameter	038	38 mm
	...	
	130	130mm
7 Distance between holes	063	63 mm
	...	
	165	165 mm
8 Shaft diameter	06	6 mm
	...	
	24	24 mm
9 Motor shaft length	20	20 mm
	...	
	50	50 mm

Motor Gearhead Combination

	Motor 1	Motor 2	Motor 3	Order Code (Gearhead)	Mounting thread G3
PE3	SMH60/B08/09		MH056/B05/09	PE3 XXX 10 M 040/063/09/20	M5
			MH056/B05/11	PE3 XXX 10 M 040/063/11/23	M5
	SMH60/B05/11		MH070/B05/11	PE3 XXX 10 M 060/075/11/23	M5
			MH070/B05/14	PE3 XXX 10 M 060/075/14/23	M5
	SY56 (NEMA 23)			PE3 XXX 10 M 038/066/06/21	M5
	SY87 (NEMA 34)			PE3 XXX 10 M 073/098/09/32	M6
PE4	SMH60/B05/11		MH070/B05/11	PE4 XXX 10 M 060/075/11/23	M5
	SMH82/B08/14			PE4 XXX 10 M 080/100/14/30	M6
	SMH82/B08/19		MH105/B09/19	PE4 XXX 10 M 080/100/19/40	M6
	SMH82/B05/19	SMH100/B05/19	MH105/B05/19	PE4 XXX 10 M 095/115/19/40	M8
	SY107 (NEMA 42)			PE4 XXX 10 M 055/125/15/32	M8
	SY87 (NEMA 34)			PE4 XXX 10 M 073/098/09/32	M6
PE5	MH105/B09/19			PE5 XXX 10 M 080/100/19/40	M6
	SMH82/B05/19	SMH100/B05/19	MH105/B05/19	PE5 XXX 10 M 095/115/19/40	M6
	SMH100/B05/24		MH105/B05/24	PE5 XXX 10 M 095/115/24/50	M8
	SMH115/B05/24		MH105/B06/24	PE5 XXX 10 M 110/130/24/50	M8
			MH145/B05/24	PE5 XXX 10 M 130/165/24/50	M10

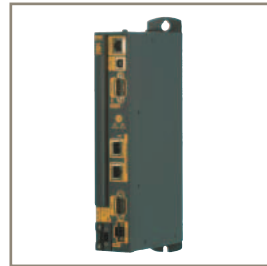
Bold = Preferred motor gearhead combinations
Only for motors with mounting bores (no mounting thread)

Controller Products

Controller

HMI

I/Os



ACR9640



InteractXpress HMI



*power*PLmC-E30



Parker I/Os

IEC61131-3 Controller with Powerlink - ACR9640

Overview

Description

The ACR EPL family is Parker's premier standalone motion controller family, capable of controlling up to 16 axes of motion. Connectivity and communication features give the ACR EPL flexibility for use in a wide variety of machine architectures. The ACR EPL excels as a standalone machine and motion controller, interfacing with a PC or working alongside a PLC. A powerful DSP makes the ACR EPL an outstanding multitasking servo controller. The ACR EPL includes easy-to-use project-development tools that enable fast, efficient application creation and maintenance. The ACR EPL is the solution for standalone applications requiring industry-leading performance in an affordable and easy-to-use package. The ACR9640 is a compact, cost-effective, EPL-only controller including Ethernet, USB and an integrated 2-port hub for ETHERNET Powerlink connections. I/O can be added using CANopen or by utilizing the inputs and outputs on the EPL drives. ETHERNET Powerlink expands the ACR EPL family by adding a real-time motion controller over standard Ethernet hardware. The high speed digital communications network enhances machine performance and configuration possibilities while reducing set-up time and installation complexity.

Features

- Control of 16 ETHERNET Powerlink drives
- 10/100 Base-T Ethernet
- USB 2.0
- EtherNet/IP compatibility
- CANopen expansion I/O
- CE (EMC & LVD), UL and cUL Recognized
- Multitasking of up to 24 simultaneous programs
- Interpolation of 8 axes in any combination
- IEC61131-3 programming with structured text, continuous function chart and ladder diagram



Technical Characteristics - Overview

	ACR9640
Power supply	24 VDC, 1A
Processor	32 bit DSP @150 MFLOPS/75 Hz
User memory	2 MB flash-based
Motion bus	ETHERNET Powerlink: 16 axes
Operating system	Multi-tasking RTOS
Ethernet	TCP/UDP, ETHERNET/IP
CANopen	DS401 protocol

Proven Control Engine with IEC61131-3 Programming

The ACR-9640 Controller provides multitasking of up to 16 simultaneous programs with multiple coordinate systems.

Motion and programming capabilities:

- IEC61131 programming
 - Structured text, ladder logic and CFC
 - PLCOpen motion function blocks
 - Parker function blocks
- Linear interpolation up to 8 axes
- Up to 16 PLC tasks: timer, cyclic or interrupt configurable task priority
- Additional 16 AcroBasic tasks available
- Segmented electronic camming
- Electronic gearing with real-time phase advance
- Linear, circular, helical and spline interpolation
- Gantry lock
- Backlash and ballscrew compensation

Hardware features:

- EPL versions support up to 16 axes of coordinated motion
- Equipped with 2 MB of user memory standard
- Robust connectors hold up in harsh environments
- EtherNet/IP, CANopen, USB2.0, RS232 and RS485 communications are supported, with multiple channels available simultaneously
- Industry-standard Ethernet/IP communications
- ETHERNET Powerlink digital motion bus
- CANopen I/O support for over 1000 points of I/O
- Indicator LED's improve your troubleshooting capability



ACR-9640 supports standard PLCOpen function blocks, and adds Parker custom multi-axis functions

PLCOpen Function Blocks:		Parker Function Blocks:		
Administrative	Motion	Gear	Cam	Other Custom Functions
MC_Power	MC_MoveAbsolute	ACR_GearIn	ACR_Camin	ACR_ReadFlag
MC_ReadStatus	MC_MoveRelative	ACR_GearIn_lhpos	ACR_Camin_lhpos	ACR_ReadDintParameter
MC_ReadAxisError	MC_MoveAdditive	ACR_GearIn_Trq	ACR_Camin_Trq	ACR_ReadRealParameter
MC_ReadParameter	MC_MoveVelocity	ACR_GearIn_Trqp	ACR_Camin_Trqp	ACR_WriteFlag
MC_ReadBoolParameter	MC_Home	ACR_GearOut		ACR_WriteDintParameter
MC_WriteParameter	MC_Stop	ACR_GearOut_Trq		ACR_WriteRealParameter
MC_WriteBoolParameter		ACR_GearOut_Trqp		ACR_MoveCoordinated
MC_ReadActualPosition				ACR_TouchProbe

Industry-standard programming in a proven platform

The ACR9640 offers the best of IEC61131-3 standard programming. With structured text, continuous function chart and ladder diagram programming, we offer the right language for your application.

Multiple fieldbus options

The ACR9640 supports EPL for high-speed motion and CANopen for analog and discrete I/O. EtherNet/IP is also supported for integration with other PLC's and HMI's. EtherNet/IP, CANopen, USB2.0, RS232 and RS485 communications are supported, with multiple channels available simultaneously.

Connectivity

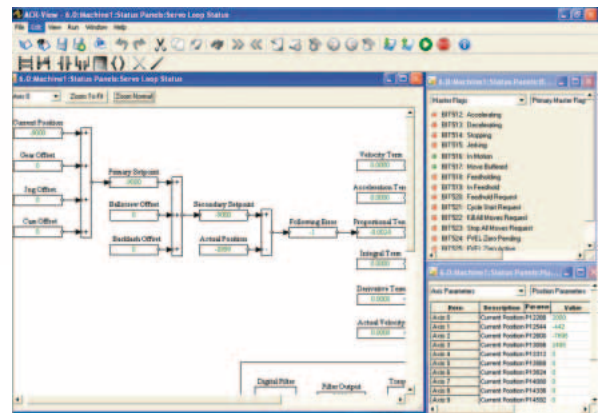
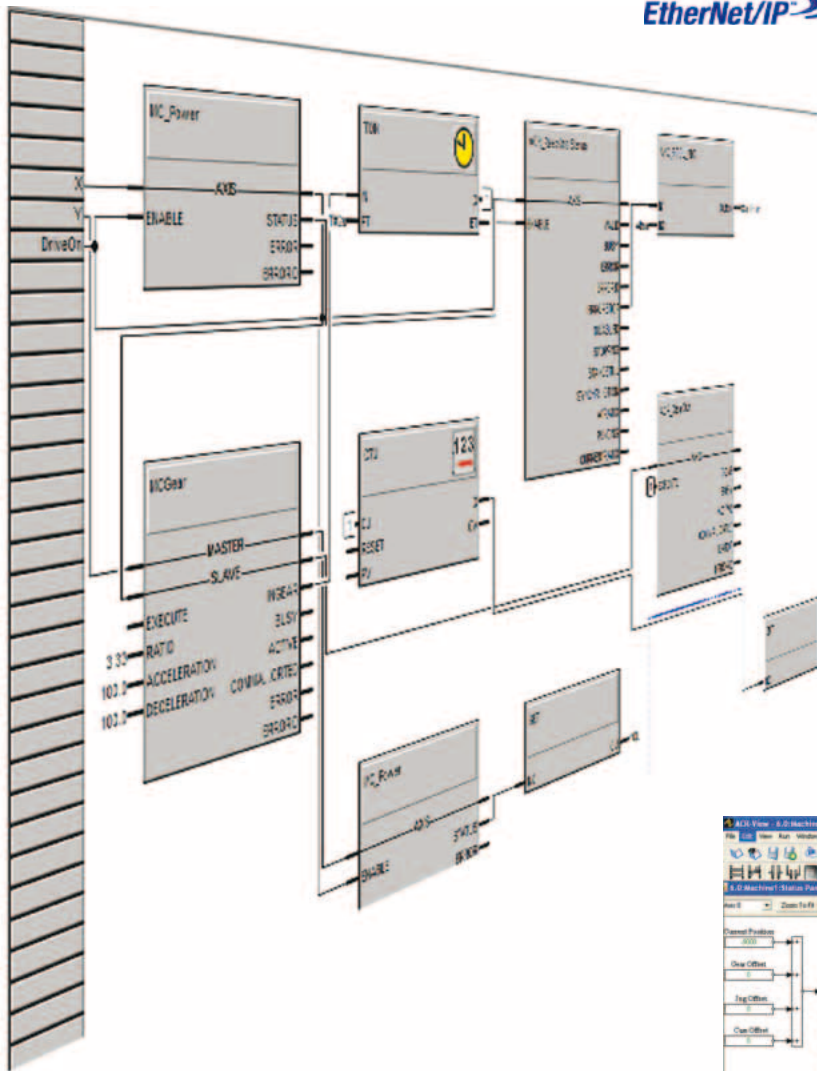
The ACR EPL controllers include a separate Ethernet port for TCP/IP and EtherNet/IP™ traffic. The ACR controller acts as a gateway between the real-time EPL domain and other communications, allowing the EPL network to remain focused on time-critical motion and I/O functions. The controller can service multiple communications channels at once, giving users many options for PC and PLC connectivity in development and normal operation.

The EtherNet/IP™ network is designed to use standard Ethernet and TCP/IP equipment for the industrial environment. The application layer protocol is an open standard - CIP™ (Control and Information Protocol).

CIP is the same upper layer protocol used by DeviceNet™ and ControlNet™ networks, allowing interoperability between various industrial devices.

ACR-View

ACR-View automatically generates a suite of common tags for each project you define. These tags can be automatically used in your Xpress HMI application.



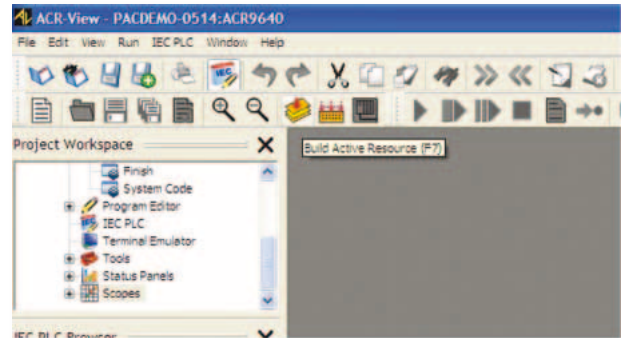
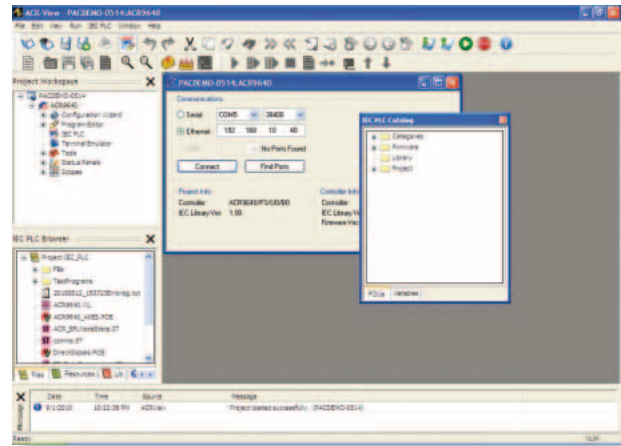
Controller Products
ACR9640

ACR-View Software Development Kit

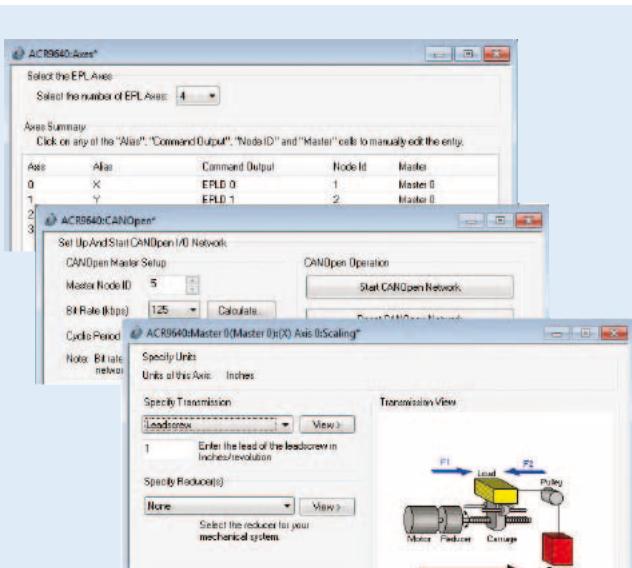
ACR-View is a powerful project-development suite that assists the user of the ACR family products in programming, debugging and commissioning their application. Many features are incorporated to assist both the novice and expert users in developing code. All the tools needed to build and maintain a motion project are included:

- Ethernet, USB, CANOpen and serial connection support
- Project Configuration Wizard
- Servo tuning tools
- Built-in oscilloscope, strip chart and XY plot
- IEC61131-3 editor (structured text, ladder diagram and continuous function chart)
- Real-time terminal interface
- Servo loop diagnostic tool
- Comprehensive status panels
- Integrated help files

Development Overview



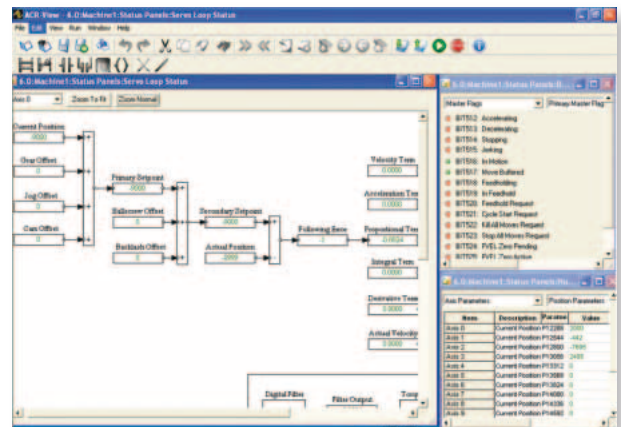
Configuration Wizard



Project set-up is streamlined through the use of the Configuration Wizard. The ACR9640 can be configured in a matter of minutes as the user is guided through a series of simple steps. ACR-View will set the necessary parameters to have the controller ready for motion and code development.

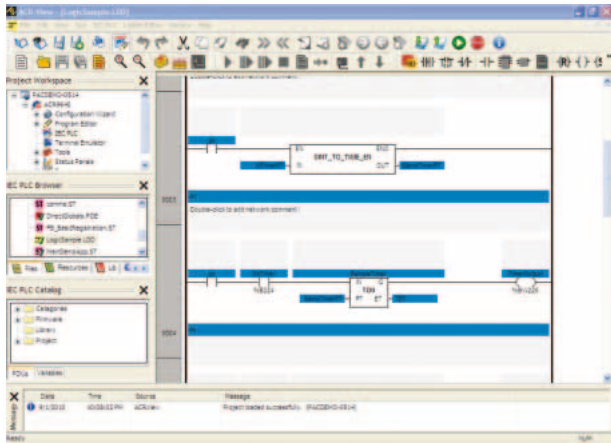
ACR-View's configurable environment allows you to create a development system that works the way you do. Elements of the environment can be docked, floated or moved to where they work best for you. Additional information is available from tool tips and a context sensitive help system.

Status Panels

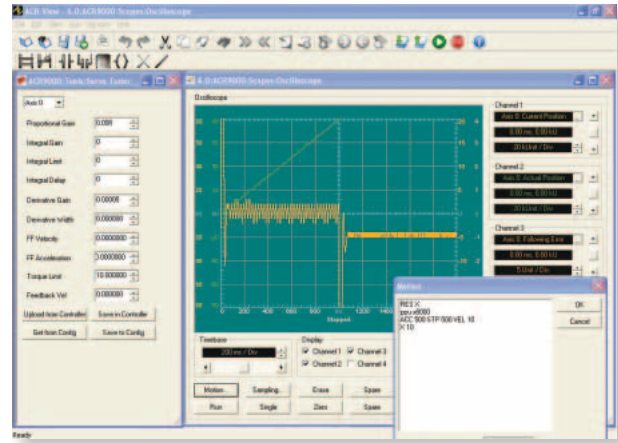


View virtually any parameter or flag within the controller using the Bit and Numeric Status panels. The Servo Loop Status panel allows in-depth analysis of servo operation.

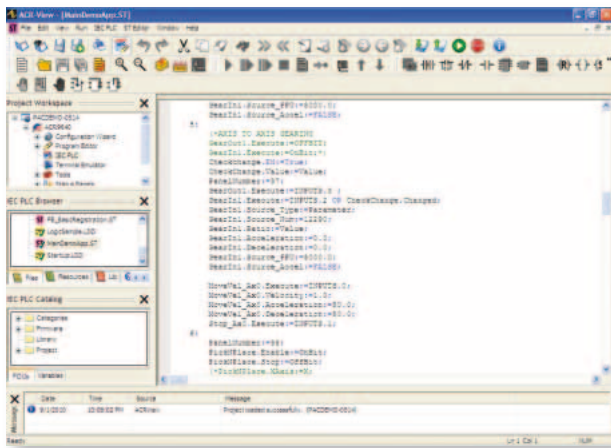
Editors



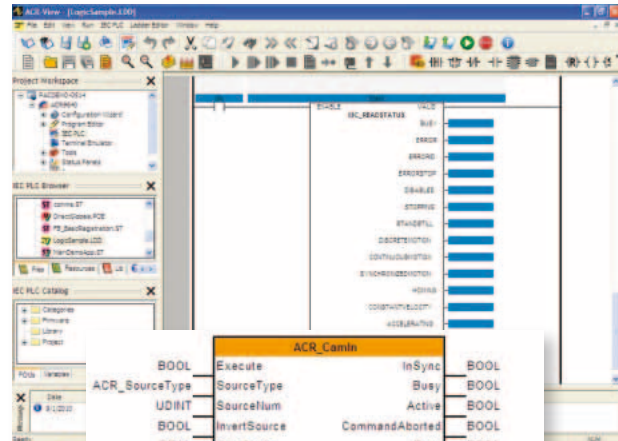
Tuning



Servo tuning can be optimized with ACR-View's powerful oscilloscope feature. Up to four channels of data can be observed and stored. Tuning gains are updated immediately and move profiles can be tailored to best fit the application's needs.

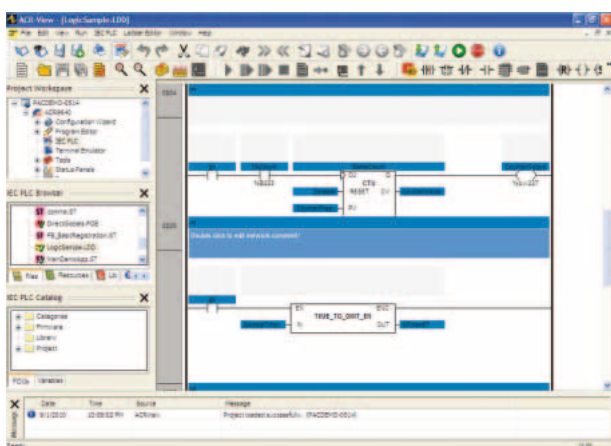


Motion Control Function Blocks



ACR_CamIn			
BOOL	Execute	InSync	BOOL
ACR_SourceType	SourceType	Busy	BOOL
UDINT	SourceNum	Active	BOOL
BOOL	InvertSource	CommandAborted	BOOL
REAL	CamScale	Error	BOOL
REAL	CamOffset	ErrorID	WORD
UDINT	CamCycles	EndOfProfile	BOOL
DINT	IndexOffset		

ACR_GearIn			
BOOL	Execute	InGear	BOOL
ACR_SourceType	SourceType	Busy	BOOL
INT	SourceNum	Active	BOOL
REAL	Ratio	CommandAborted	BOOL
REAL	Acceleration	Error	BOOL
REAL	Deceleration	ErrorID	WORD
REAL	SourcePPU		
BOOL	SourceAccel		
DINT	OffsetMax		
DINT	OffsetMin		



IEC61131-3 editors support complete project development in one or several supported languages. Motion and I/O logic are supported in all languages.

ACR-View not only incorporates the industry-standard PLOpen function blocks for motion, but goes beyond with proprietary multi-axis and coordinated function blocks.

ETHERNET Powerlink

EPL Controller Managing Node (MN)

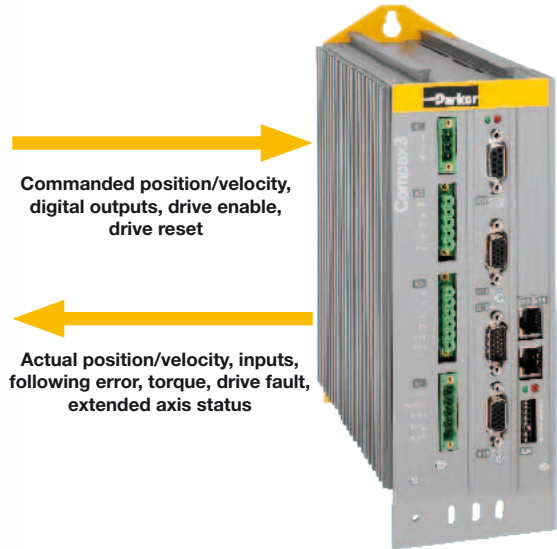
- Stores and runs the motion program
- Supervises and controls local drive I/O and system expansion I/O
- Generates motion trajectories for all axes
- Sends position set points to drives
- Synchronizes positions of multiple axes for tightly coordinated motion

Compax3 EPL I30 Controlled Node (CN)

- Closing servo loops including torque, velocity and position loops
- Local I/O (8 in, 4 out)
- High-speed inputs for registration
- Encoder feedback from motor, Resolver ...
- STO



ACR9640 Multi-axis
EPL Controller



Compax3
EPL Servo Drive

ETHERNET Powerlink Communications

- Replace the traditional ± 10 V analog control and feedback cables with an all-digital Ethernet network
- Real-time, deterministic data to and from nodes is guaranteed each cycle with the slot communications network protocol, illustrated in the diagram below
- Proven, robust CANopen profiles are sent over proven, robust Ethernet hardware
- Standard TCP/IP communications does not interrupt determinism, as it takes place during the asynchronous slot at the end of the cycle
- Excellent performance with timing jitter $< 1 \mu s$



Technical Characteristics

Technical Data

ACR9640 EPL Controller

Hardware	Axes/controller	16 EPL axes
	Power requirement	24 VDC, 1 A
	Processor	32 bit floating-point DSP @150 MFLOPS / 75 MHz
	User memory	2 MB flash-based. Retains user programs and system configuration parameters
	Firmware	Flash-based
	Operating system	Multi-tasking RTOS
	Battery backup	Non-volatile memory retains all system and user variables (5 years @25 °C)
Performance	Multi-tasking	8 coordinated systems/16 text programs/8 ladder programs
	Trajectory update	64 bit precision, 500 µs (axes dependent)
	Interpolation	Linear, circular, sinusoidal, helical, elliptical, spline, 3D arcs
Communications	ETHERNET Powerlink	ETHERNET Powerlink V2. Integrated 2-port hub, RJ-45 connectors Supports EPL DS402 drives in interpolated position mode
	Serial interface	1 serial port (RS232 and/or RS422)
	Ethernet	10/100 Base-T, RJ-45 connector. Supports IP protocols TCP/UDP, EtherNet/IP
	USB	USB 2.0, type B connection
	CANopen	Standard 9-pin D-sub connector Supports DS401 protocol for I/O devices
Provided software	Development software	ACR-View software development kit
	Language support	Libraries for C++, VB6, C#, VB.NET, LabVIEW

Environmental Characteristics

Ambient conditions

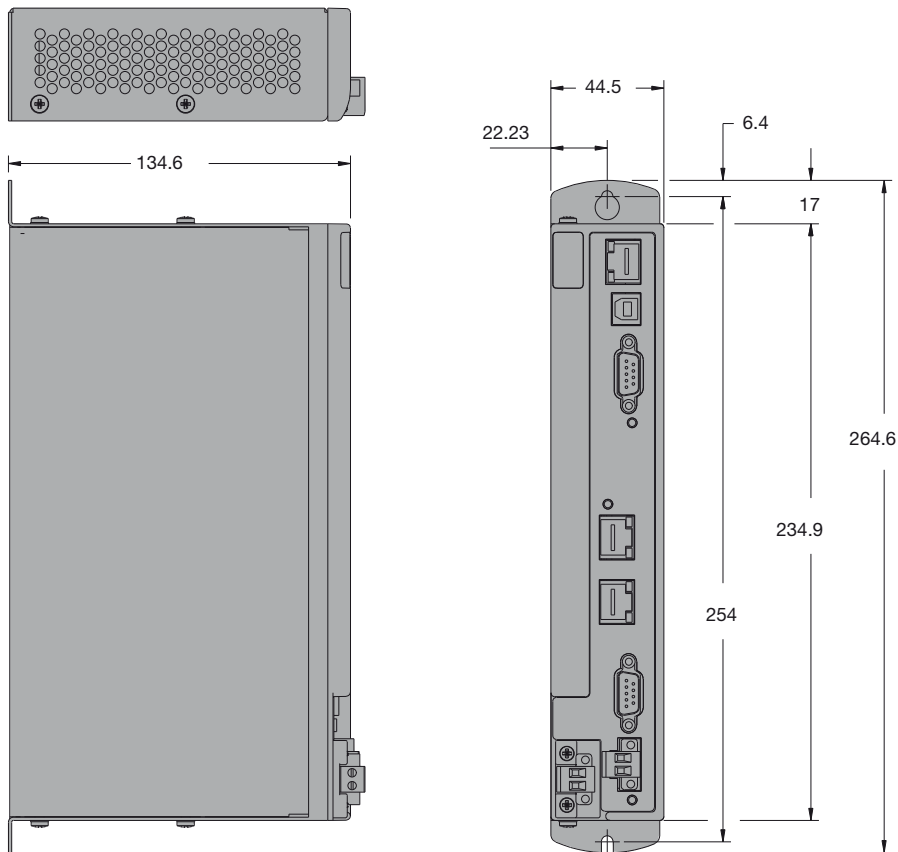
Temperature range	<ul style="list-style-type: none"> Operating temperature: 0...+50 °C Storage temperature: -40...+75 °C
Humidity	Operating humidity: 0...95 % non-condensing
Pollution degree	2 (per IEC61010)
Shock	15 g, 11 ms half-sine
Vibration	10...2000 Hz @2 g

Standards and Conformance

CE compliance	CE (EMC) CE (LVD)
UL certification	UL Recognized
RoHS compliance	Complies with European Union Directive 2002/95/EC - Restriction of Hazardous Substances (RoHS)

Dimensions

Dimensions [mm]



Order Code

ACR9640 EPL

	1	2	3	4
Order example	9640	P1	U0	B0

1	Controller version¹⁾	
	9640	24 VDC input
2	Communication	
	P3	Ethernet, USB, serial and CANopen
3	Number of axes, encoder inputs	
	U0	16 EPL axes
4	Memory	
	B0	Battery backed RAM

¹⁾ All models include ACR-View Software Development Kit CD

Accessories

Cables

	1		2		3
Order example	71	-	016939	-	10

1	Type number of accessory	
	71	Cable
2	Communication	
	016939	RS232 communication cable PC-ACR
3	Cable length	
	10	3 m

EPL accessory ACR-Compax3

	1		2
Order example	SSK28	/	01

1	Type number of accessory	
	SSK28	RJ45 crossover cable (Powerlink)
2	Cable length	
	20	0.25 m
	21	0.5 m
	01	1.00 m

CANopen accessory ACR-PIO

	1
Order example	BUS10/01

1	Type number of accessory	
	SSL02	CANopen cable (length per 1 m) ¹⁾
	BUS10/01	Bus terminator

¹⁾ Example: 2 pieces of SSL02 = 1 SSL02 with 2 m cable length

Parker I/O System - PIO

	1		2
Order example	PIO	-	337

1	Series	
	PIO	Parker I/O system

2	Fieldbus coupler	
	337	CANopen coupler
	347	CANopen coupler ECO

Bus terminals

Digital inputs

400	2DI 24 VDC 3.0 ms
402	4DI 24 VDC 3.0 ms
430	8DI 24 VDC 3.0 ms

Analog inputs

456	2AI ±10 VDC differential input
468	4AI 0-10 VDC S.E.
480	2AI 0-20 mA differential input

Digital outputs

501	2DO 24 VDC 0.5 A
504	4DO 24 VDC 0.5 A
530	8DO 24 VDC 0.5 A

Analog outputs

550	2AO 0-10 VDC
552	2AO 0-20 mA
556	2AO ±10 VDC

System terminals

600	Bus terminal (required as terminal for each fieldbus node)
602	Power supply terminal 24 VDC

Accessories

PIO quick designation system (designation indicators for manual labeling)

501-WEISS	white
501-GELB	yellow
501-ROT	red
501-BLAU	blue
501-GRAU	grey
501-ORANGE	orange
501-HELLGRUEN	light green

IEC61131-3 Controller with CANopen - C3 *powerPLmC*-E30

Overview

Description

Compax3 *powerPLmC* is a control system for combined PLC, motion and visualization tasks. CANopen combines the bus components with the CANopen master "Compax3 *powerPLmC*". The power range of commands based IEC61131-3 is available for control tasks.

Programming takes place in the "CoDeSys" high-power programming system via Ethernet. The implementation of the motion tasks is supported by PLCopen function modules.



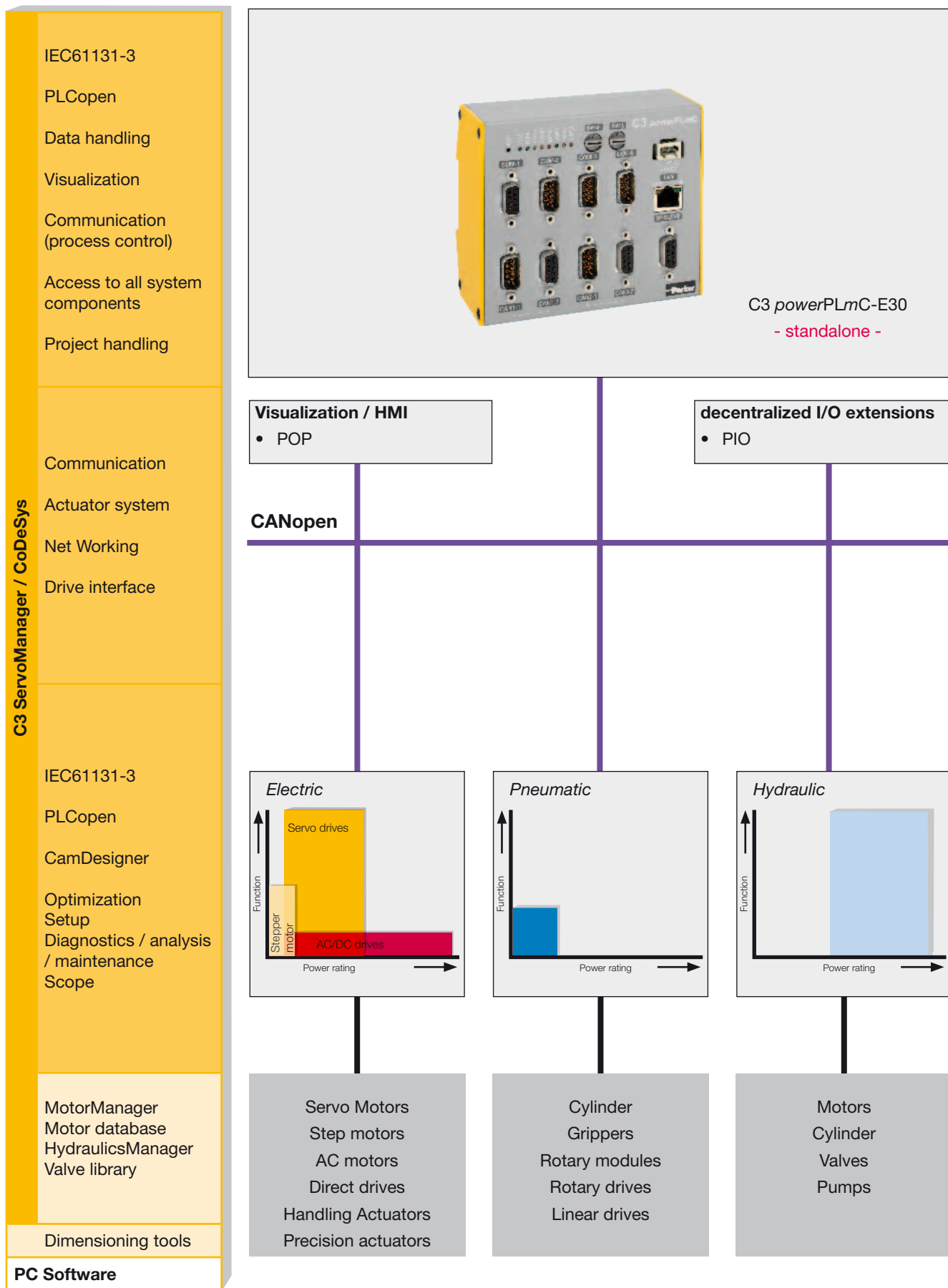
Features

- **32 Bit - RISC - Processor:** <100 µs for 1000 IL commands
- **CANopen multi-axis communication**
- **Simple integration of the servo axes via the Drive Interface**
- **Ethernet:**
 - Programming interface,
 - Remote diagnostics via Internet/Intranet
 - Process visualization,
 - System integration
- **Programmable based on IEC61131-3 / PLCopen**
- **CoDeSys V2.3 development tool**
- **PLC functionality**
 - 4 real-time task types: free-running, cyclical, event-triggered (internal or external events)
 - Debugging, single step, watch function, log
 - Online program change
- **PLC extensions offered by Parker:**
 - POP: Parker Operator Panel (MMI) - from the 4-line display to the color touch screen
 - PIO: Parker digital and analogue inputs/outputs - modular extensions
 - InteractXpress (HMI)

Technical Characteristics - Overview

Platform	32 bit RISC processor 200 MHz
Program memory	128MB Compact Flash card
Data memory SDRAM / Data memory non volatile	16 MB / 32 kB (Retain)
Controller features	
Processing time	<100 µs for 1000 IL rows
Minimal cycle time	Typical 1 ms
Programming and debugging	
Programming system	CoDeSys V2.3
Programming languages	IL, SFC, FBP, ST, LD, CFC
Visualization	
Locally on the programming system	Yes
Web Server	Yes
OPC Server	Yes
Interfaces	
general	2x RS232
Fieldbus options	<ul style="list-style-type: none"> • 2 x CANopen Master • DP - SLAVE (Profibus) • Ethernet <ul style="list-style-type: none"> • 10/100 MBauds • TCP / UDP • Modbus TCP/IP Server
Digital and analog inputs/outputs option	Any (depending on the number of axes) via PIO and CANopen

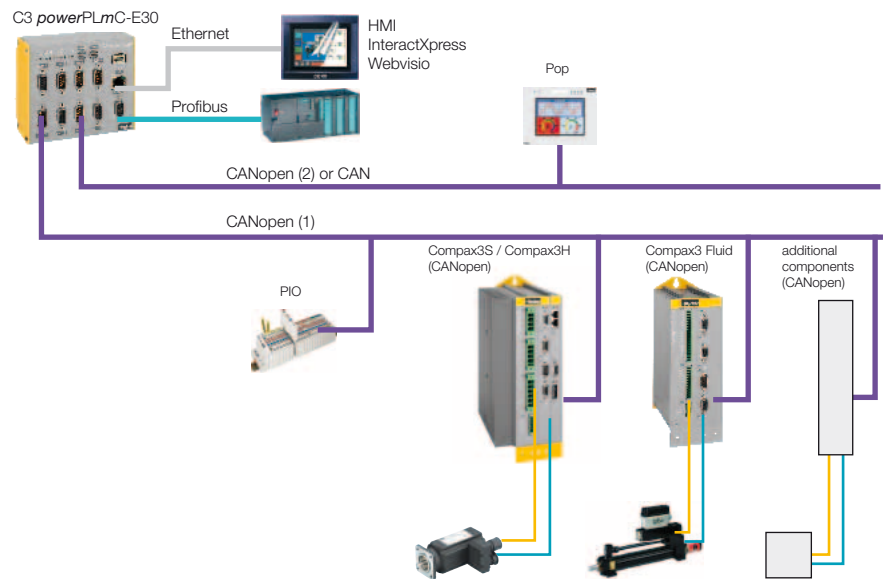
Application of the Multi-Axis Motion Controller C3 powerPLmC-E30



System Design with the Motion PLC C3 powerPLmC-E30

Main fields of application

- More than two axes for motion automation
- High degree of system integration (e.g. via Ethernet)
- Integration of complex devices for machine visualization and operation
- Connection to a wide number of digital and analog inputs
- Integration of pneumatic and hydraulic automation devices
- High proportion of PLC typical tasks
- Integration of additional automation components via a second CAN bus.
- Basis for the realization of hybrid machine concepts electromechanics, hydraulics and pneumatics



Functions

Motion Control

- Ready-made PLCopen compliant Motion Control function modules allow users to create programs effectively
- Drive interface
 - Integrating a servo axis without fieldbus knowledge
 - shortest transmission times due to internal cache memory; only modified data is transmitted

Project Management

- Saving and archiving an entire project (source file) including symbols and comments to make service calls easier, because there is no need for any project data on the device itself.
- Creating and protecting user-specific libraries that can be reused as tested sections of programs
- Various user levels make it possible to lock sections of the program with passwords
- 5 IEC languages plus CFC can be selected
- Data import / export

File Handling

- The controller can generate files (e.g. for error protocols, recipes, machine parameters)
- Files are available via the FTP server on a drive in C3 powerPLmC and can be downloaded onto a PC.
- Error messages can be assigned to an error string by means of the error number and then stored together with the time of day (from an integrated clock)

Networking control systems

- Multiple control systems can be networked together via Ethernet
- Exchanging information via network variables

Visualization

- Integrated into the local programming system
- Monitoring of machine or system states
- Debugging
- Diagnosis
- With integrated access to web server via standard browser
- OPC interface for integrating Windows-based visualization programs such as InteractX, WinCC, Intouch, Protool
- Remote diagnostics

Technical Characteristics

General information

- Platform: 32 bit RISC processor 200 MHz
- 128 MB Compact Flash card
- 4 MB FLASH program memory
- 16 MB SDRAM data memory
- 32 kB (Retain) non volatile data memory
- Real time clock
- Real time multitasking operating system
- 24 VDC supply

Controller features

- Processing time <100 µs for 1000 IL rows
- Real time tasks
 - Coasting
 - Cyclical
 - Event-controlled, internal / external events
- 1 ms minimum cycle time
- Online Program Change
- Watchdog Timer
- Data exchange in distributed systems (network variables)

Programming and debugging

- CoDeSys V2.3 programming system
- IL, SFC, FBP, ST, LD, CFC programming languages
- IEC61131-3 range of commands
- PLCopen - Motion control modules
- Debug, Single Step, Watch function
- Simulation, online trace
- Breakpoints (source level debugging)
- Source code download
- Write, read, force variables
- Fast Ethernet programming interface

Visualization

- Locally on the programming system
- Web - Server
- OPC Server

Interfaces

- 2 x CANopen Master
- DP - SLAVE (Profibus)
- Ethernet
 - 10/100 MBauds
 - TCP / UDP
- Modbus TCP/IP Server
- Any digital and analog inputs/outputs (depending on the number of axes) via PIO and CANopen

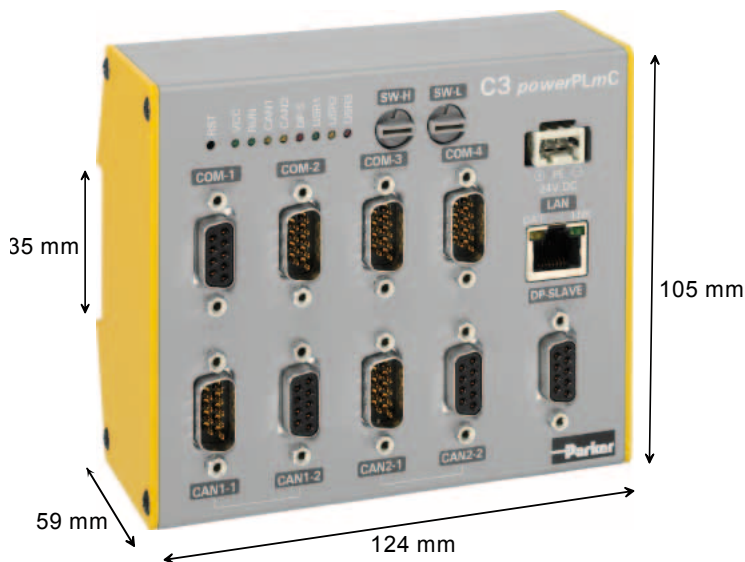
Standards and Conformance

CE compliance	<ul style="list-style-type: none"> • EC EMC directive EN 61 000-6-2 and EN 61 000-6-4
UL certification	<ul style="list-style-type: none"> • UL conform according to UL508C
RoHS compliance	Complies with European Union Directive 2002/95/EC - Restriction of Hazardous Substances (RoHS)

Ambient conditions

Temperature range	0...45 °C
Humidity	max. relative air humidity <=85% class 3K3; non-condensing

Dimensions



Connector Layout



Order Code

C3 powerPLmC

	1	2
Order example	C3 powerPLmC	-E30

1 Product	C3 powerPLmC Motion PLC	
2 Type	-E30 Standalone Version	

Interface cables and connectors

	1
Order example	SSK01/01

1 Accessories		
SSK28/01	RJ45 Crossover cable 1 m (PC-C3 powerPLmC-E30)	
SSL02⁽¹⁾	CAN Bus cable ⁽²⁾ not prefabricated	
BUS10/01	CAN bus connector Plug with 2 cable inputs (1x arriving, 1x continuing CANbus cable), as well as a switch for activating the terminal resistor.	

⁽¹⁾ Length given as number in meters

Parker I/O System - PIO

	1		2
Order example	PIO	-	337

1 Series	PIO Parker I/O system		
-----------------	------------------------------	--	--

2 Fieldbus coupler			
337	CANopen coupler		
347	CANopen coupler ECO		

Bus terminals

Digital inputs

400 2DI 24 VDC 3.0 ms

402 4DI 24 VDC 3.0 ms

430 8DI 24 VDC 3.0 ms

Analog inputs

456 2AI ±10 VDC differential input

468 4AI 0-10 VDC S.E.

480 2AI 0-20 mA differential input

Digital outputs

501 2DO 24 VDC 0.5 A

504 4DO 24 VDC 0.5 A

530 8DO 24 VDC 0.5 A

Analog outputs

550 2AO 0-10 VDC

552 2AO 0-20 mA

556 2AO ±10 VDC

System terminals

600 Bus terminal
(required as terminal for each fieldbus node)

602 Power supply terminal 24 VDC

Accessories

PIO quick designation system
(designation indicators for manual labeling)

501-WEISS

white

501-GELB

yellow

501-ROT

red

501-BLAU

blue

501-GRAU

grey

501-ORANGE

orange

501-HELLGRUEN

light green

Touchscreen HMI with Integrated Webserver - Interact Xpress

Overview

Description

Distributed HMI in a durable and affordable package

XPR2 PowerStation line offers a hardware/software solution that simplifies and cost-reduces distributed HMI applications. Available with a 6", 8", 10", 15" TFT panel mount touchscreen or new non-display system. XPR2 models are designed to optimize the performance, storage and connectivity features of Interact Xpress™ HMI software.

This CE-based workstations features the latest embedded processor technology supporting fanless operation, CompactFlash® storage, USB, serial and 100Base-T Ethernet connectivity.

Take full advantage of the web for; HMI design, publishing, runtime and support

Interact Xpress fully leverages the wide availability of web browsing software to enable distributed HMI software, remote support and application sharing on the internet and IP networks. Interact Xpress HMI applications are developed, edited, published and run in an HMI that is a web server, allowing users and OEMs to easily publish upgrades and applications to any global location with an internet connection and a web browser.

Interact Xpress combines a rich, graphical runtime interface with HMI development tools that can be accessed from either the HMI panel or any PC running Internet Explorer®.

Features

- Fanless operation
- More than 40 communication drivers
- Complex animation capabilities
- Alarm logging
- Sending email on alarms
- Recipes
- Real time trending
- PDF documents viewing
- Multi language support
- Screen templates



Technical Characteristics - Overview

Display	262 144 color TFT
Storage options	512 MB CompactFlash
Operating system	Windows CE
Ports	<ul style="list-style-type: none">• 2 USB• RS232/422/485• 10/100 Base-T Ethernet
Power supply	24 VDC

Complete Transparency and Supervisory Control

Interact Xpress provides your system with a connection to the rest of the company or the rest of the world. It offers a completely web-published environment where any plant-floor data or information can be accessed from any web browser with an Ethernet connection to the XPR PowerStation on your machine.

- Reduces HMI development time by automatically sharing tags with the ACR9640 programmable automation controller
- Pre-built template screens for common functions reduce your time to market
- Integrated development environment allows applications to be designed and edited on the runtime system
- HMI designer/editor supports multiple runtime versions, eliminating version control management headaches
- Easy, object-based screen development using a "tool bin" of pre-configured panels tools and drag-and-drop editing
- Panel tools include pushbuttons, numeric entry, selection entry, numeric displays, bar graphs, meters, gauges, sliders, message displays, time/date display and more
- 3-D, shaded panel tool graphic are available in multiple styles with no additional work
- Includes an integrated graphics library
- Jpeg (.jpg) and Flash (.swf) image support
- Complex animation capabilities and video support
- Web link support
- Pre-configured alarm tool with automatic collection of historical alarm data
- Integrated tag editor with drag-and-drop tools and import/export to Excel and other software packages



- Development software for offline design/editing supports Windows® 2000 and Windows® XP operating systems
- Reduces SCADA development time by up to 80 %, when used with our InteractX SCADA
- Interact Xpress is offered in everything from a no-display system to a 15" integrated display size
- More than 40 bundled communications servers allow Xpress to work with everything from our ACR9640 Xpress to virtually any legacy equipment you may have

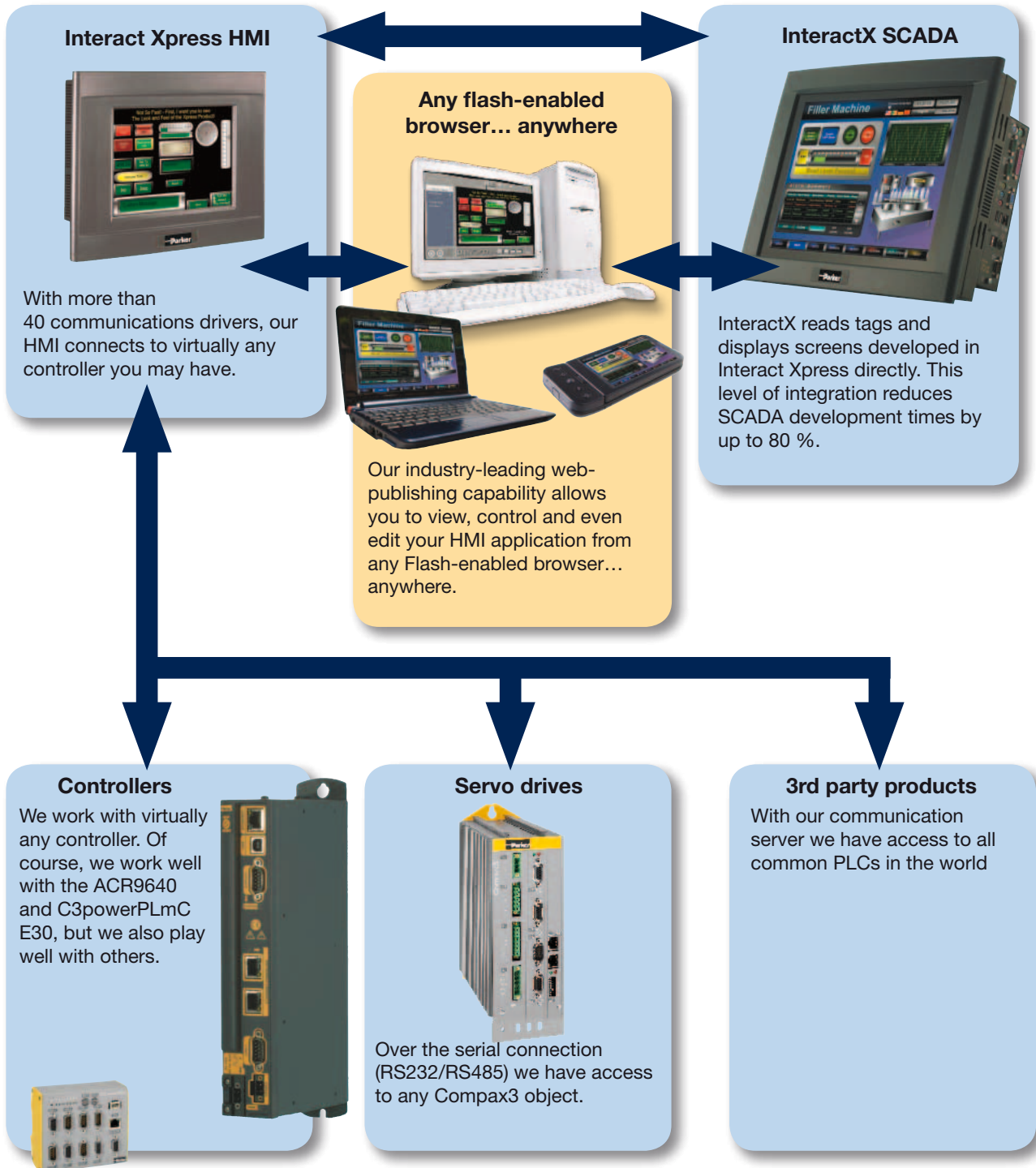
- Real time trend display capability: Up to 1000 point historical buffer Any tag or expression can be used for values
- Multi Language support: Support export applications Easily export an application and translate all text, using standard tools

Real-time trending with 1000-point buffer for each pen.



Windows® is a registered trademark of Microsoft Corporation.

Parker's Interact Xpress HMI with InteractX SCADA delivers your plant-floor data wherever it's needed, when it's needed.



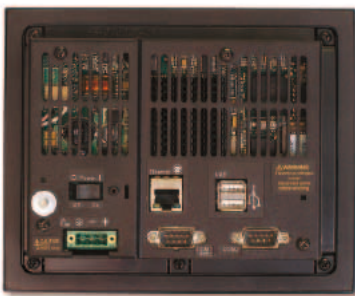
Controller Products
Interact Xpress

HMI Power and Connectivity In a Durable, Affordable Package

Interact Xpress software is pre-installed and bundled with XPR2 PowerStation hardware, which is designed to optimize the performance, storage and connectivity features of Xpress HMI. This CE-based workstation is available with 6", 8", 10" and 15" TFT touchscreen display models, embedded fanless CPU technology, 256 MB DRAM and a full range of standard features such as CompactFlash storage, 2 USB ports, 2 RS232 and RS232/422/485 ports and a 100Base-T Ethernet port.

With standard 512 MB CompactFlash storage, XPR2 models use non-rotating storage media for high system reliability. And like all PowerStations, these units are quality tested to endure more harsh conditions in a day than most operator stations see in a lifetime.

XPR2 PowerStations offer durability and no moving parts, to complement Xpress software in providing a high-value, Distributed HMI solution.



Interact Xpress Features

- Sophisticated graphics look and feel with ease of development
- Integrated Web Publishing capability for distributed applications
- Applications can be served, created and edited online from any PC with Internet Explorer
- Available offline, development software allows work on applications when a live Internet connection is not available
- Advanced security for single or multi-user applications
- Tools for historical alarm data
- Capacity for complex graphics and animations
- Standard Ethernet port for both networking and controller communications
- More than 40 device communication drivers
- Unlimited tags
- Color depth to 262 144 colors



Technical Characteristics

Technical Data

Model	XPR200	XPR206	XPR208	XPR210	XPR215
Display size	Remote unit No display	6" color TFT, 5.7" (145 mm) diagonal	8" color TFT, 8.0" (203mm) diagonal	10" color TFT, 10.4" (264mm) diagonal	15" color TFT, 15.0" (380mm) diagonal
Resolution	-	VGA (640x480), 262 144 color TFT	VGA (640x480), 262 144 color TFT	VGA (600x480)	XGA (1024x768), 262 144 color TFT
Luminance 1 NIT = 1 cd/m ²	-	350 NIT	400 NIT	200 NIT	250 NIT
Viewing angle	-	±80° L/R, 80° U, 70° D	+70 L/R, 60° U, 65° D	+70° L/R, 50° U, 60° D	+80° L/R, 80° U, 60° D
Backlight	-	75 000 h	50 000 h	50 000 h	40 000 h

Model	XPR200	XPR206	XPR208	XPR210	XPR215
Interface	Analog resistive touchscreen				
Operating system	Windows CE version 5.0				
Processor support					
Processor	AMD 500 MHz LX800 processor				
Cache	256 kB (L1/L2)				
Memory	256 MB DRAM				
Storage options					
CompactFlash	512 MB ¹⁾ CompactFlash external type II slot (IDE bootable)				
Floppy/CD ROM	External connection via USB				
Ports					
Keyboard	USB 2.0				
Mouse	USB 2.0				
USB	(2) USB 2.0 ports type-A, CD/floppy/USB drive bootable with over current protection				
Serial	(1) RS232 9-Pin D-sub (1) RS232/422/485 9-Pin D-sub				
Ethernet	(1) 10/100Base-T w/ RJ45				
Power requirement	24 VDC, 2 A maximum, optional AC adaptor				

¹⁾ Actual storage volumes may be higher

Environmental Characteristics

Ambient conditions

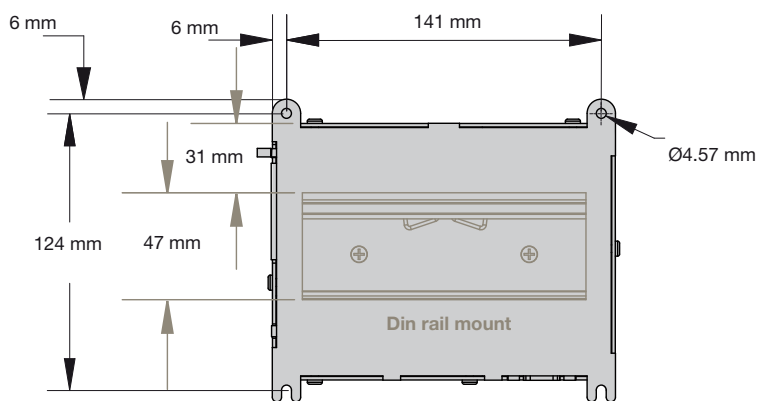
Temperature range	0...50 °C
Relative humidity	5...95 % (non-cond.)
Shock	10 g, 11 ms (operating) 30 g, 11 ms (non-operating)
Vibration	10...500 Hz, 2 grms (random-operational-CompactFlash)

Standards and Conformance

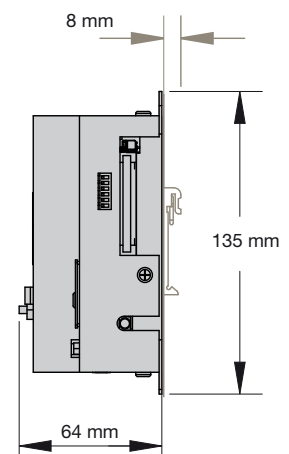
Agency approval	CE; UL/cUL
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Dimensions

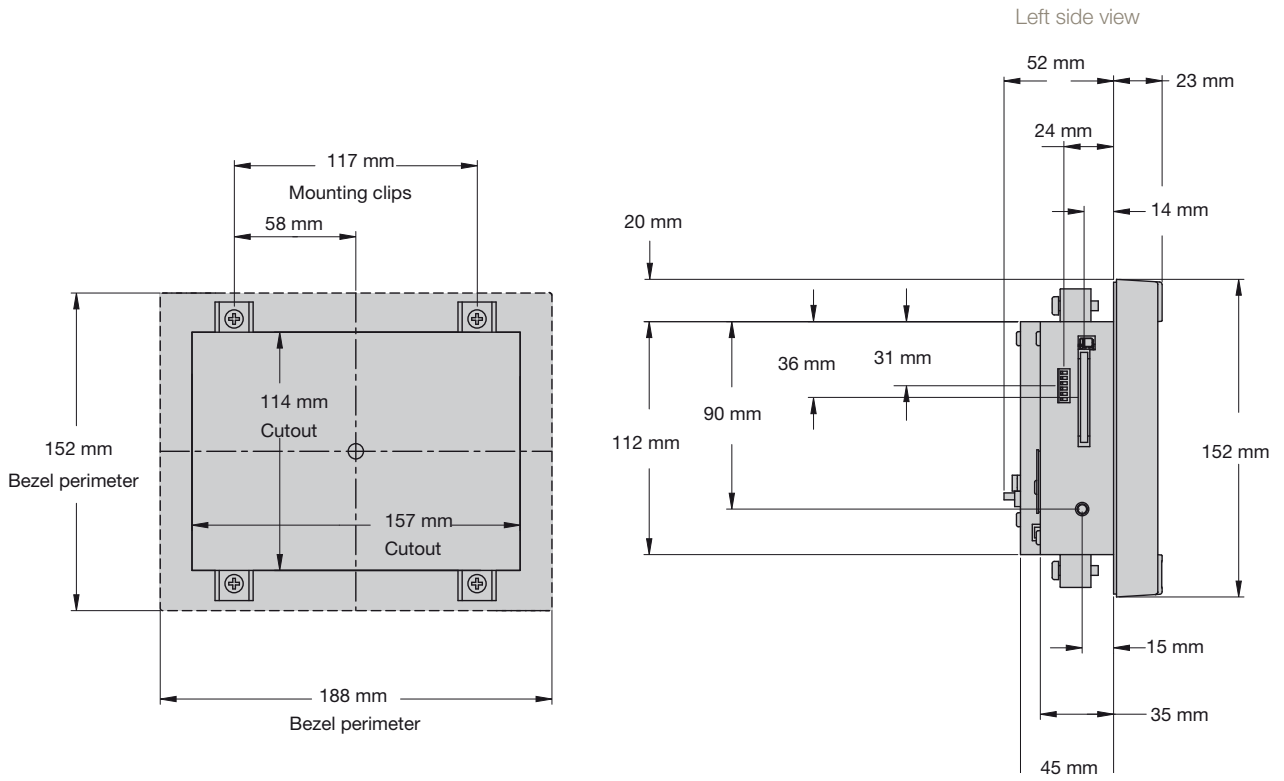
XPR200 mounting dimensions



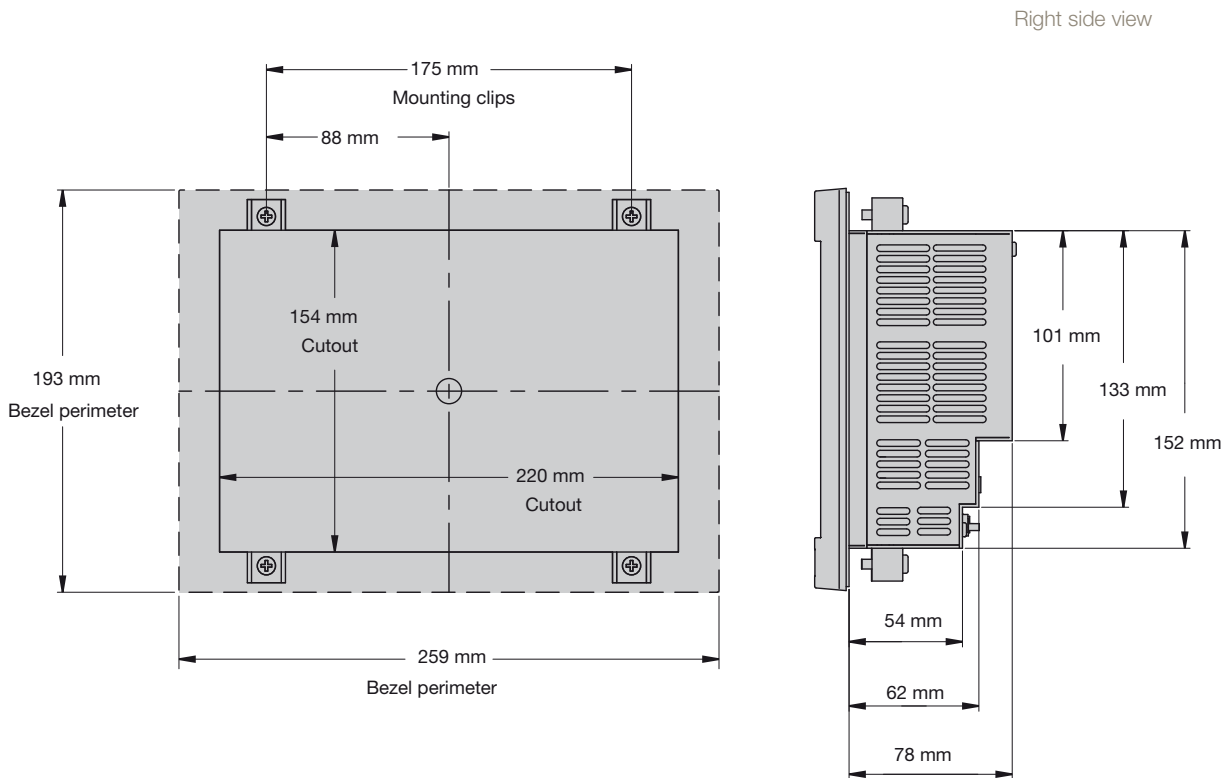
Right side view



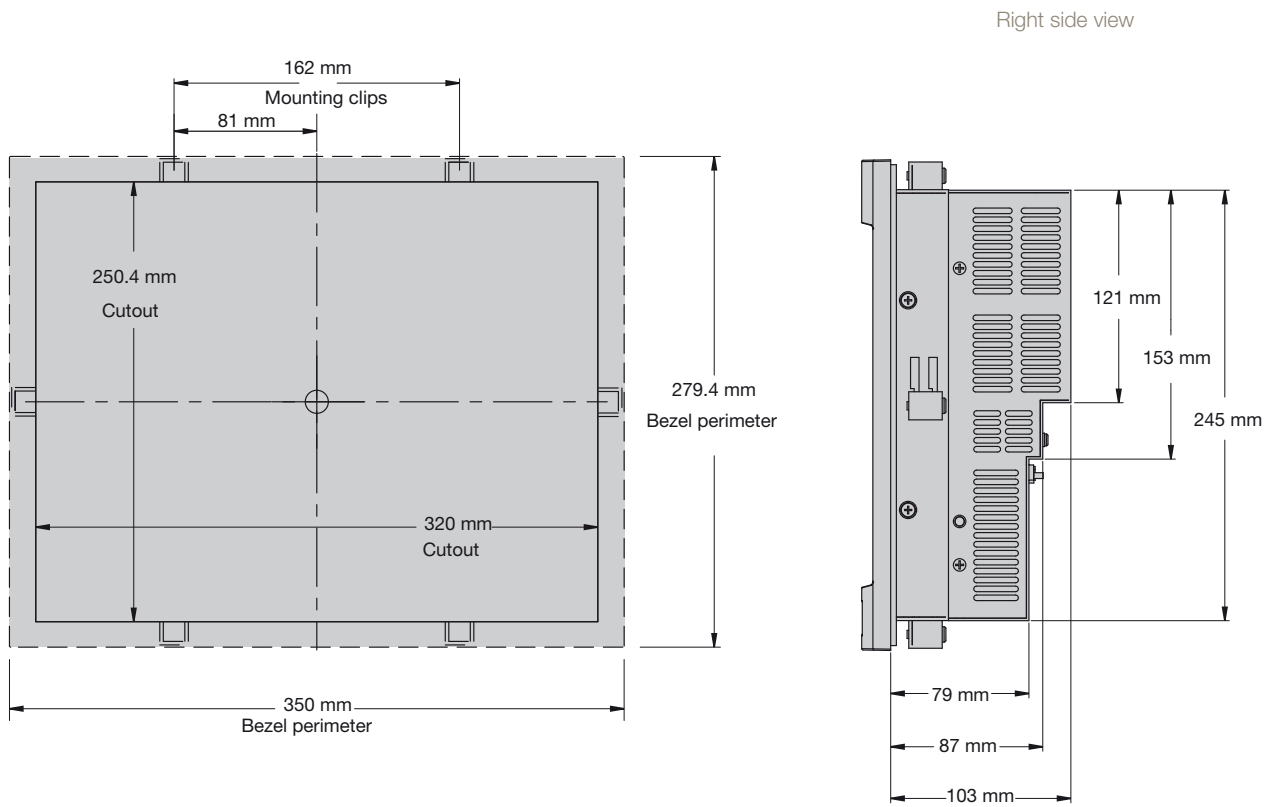
XPR206 cutout and mounting dimensions



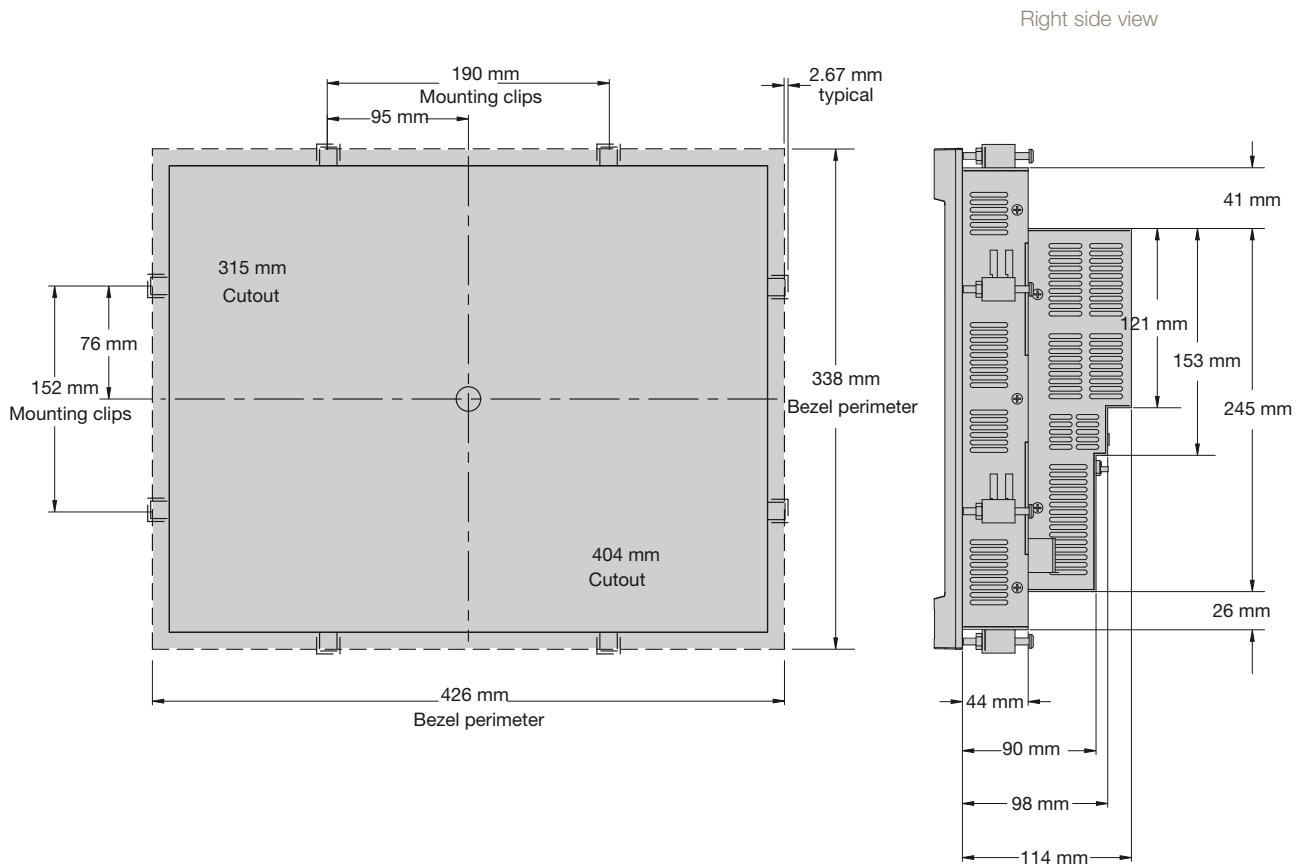
XPR208 cutout and mounting dimensions



XPR210 cutout and mounting dimensions



XPR215 cutout and mounting dimensions



Order Code

Interact Xpress

	1	2		3	4	5
Order example	XPR2	10VT	-	2	P	3

1 Series	XPR2	Industrial PC
2 Display	00XN	Non-display system
	06VT	6" color TFT VGA (640x480)
	08VT	8" color TFT VGA (640x480)
	10VT	10" color TFT VGA (640x480)
	15XT	15" color TFT XGA (1024x768)
	15AT	15" color TFT XGA (1024x768) Stainles Bezel

3 Processor	2	AMD LX800 500 MHz~
4 CompactFlash⁴⁾	P	512 MB FLASH
5 Agency approvals	3	UL/cUL/CE

Accessories

Software

	1
Order example	IXM-0200

1 Type number of accessory	IXM-0200	Xpress Manager, Offline Development Software
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Cables

	1		2
Order example	SSK01	/	01

1 Type number of accessory	SSK01/xx	RS232 cable XPR to Compax3 ¹⁾
	SSK28/xx	RJ45 Ethernet crossover cable ²⁾

Length code for cables

¹⁾ Length code 1 (Example: SSK01/09 = length 25 m)

Length [m]	1.0	2.5	5.0	7.5	10.0	12.5	15.0	20.0	25.0	30.0	35.0	40.0	45.0	50.0
Order code	01	02	03	04	05	06	07	08	09	10	11	12	13	14

²⁾ Length code 2 for SSK28

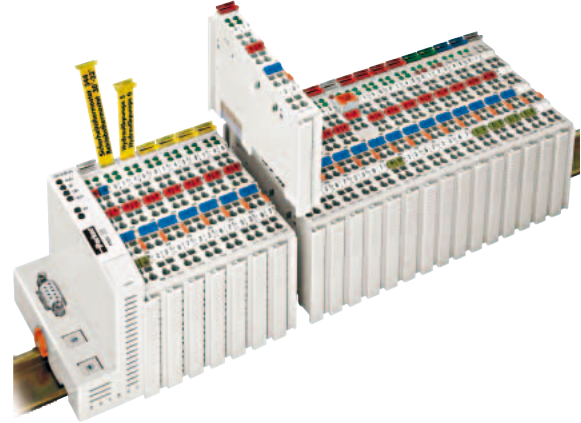
Length [m]	0.17	0.25	0.5	1.0	3.0	5.0	10.0
Order code	23	20	21	01	22	03	05

Modular I/O - System - PIO

Overview

Description

Parker Hannifin's modular expandable bus terminal system uses electronic devices to capture a wide variety of control signals from field devices. Connections to the field level can be implemented quickly and reliably with PIO. PIO offers the convenience of exceptionally simple installation. The individual modules can be installed and removed without any tools. Different modules can be combined with each other within the bus terminal system. Gold-plated contacts guarantee reliable connections between the individual modules. A conducting ground contact adds additional safety.



Features

- Fieldbus independent layout
- Easy to extend with additional modules
- Exceptionally compact design
- Intrinsically-safe contacts
- Maintenance free
- Mixed voltages can be combined
- Great flexibility ensures optimal adaptability in different applications
- Integrated input filter
- Opto-isolation
- Suitable for copper cables from 0.08 mm² to 2.5 mm²
- Error and status display (LED)
- Access options for simple signal test
- Short-circuit proof inputs
- Options for clear, unambiguous identification

Technical Characteristics - Overview

PIO - Parker I/O-System	
Bus terminals	Digital and analog input and output terminals
Fieldbus coupler (Standard and ECO version)	<ul style="list-style-type: none"> • CANopen • PROFIBUS • DeviceNet • ETHERNET TCP/IP
Current via power contacts	max. 10 A
Voltage isolation	500V System / Supply
Operating temperature	0...55 °C
Enclosure rating	IP20
Resistance to vibrations	in accordance with IEC 60068-2-6
Resistance to impact	in accordance with IEC 60068-2-27
EMC Interference immunity	in accordance with EN 50082-2 (96)
Interference emission	in accordance with EN 50081-2 (94)
International Standards	CE, UL 508

Technical Data

Fieldbus Coupler



CANopen

	PIO-337 Standard	PIO-347 ECO
Signals	digital and analog	digital and analog
max. number of couplers in the system	110	110
Transfer medium	screened copper cable 3 x 0.25 mm ²	screened copper cable 3 x 0.25 mm ²
max. bus length	40...1000 m depending on cable and baud rate	40...1000 m depending on cable and baud rate
Transfer rate	10 kBaud...1 MBaud	10 kBaud...1 MBaud
max. number of bus terminals	64	64
Fieldbus input process image	max. 512 bytes	max. 32 bytes
Fieldbus output process image	max. 512 bytes	max. 32 bytes
Supply voltage	24 VDC (-15 %...+20 %)	24 VDC (-15 %...+20 %)
Input current	max. 500 mA at 24 V	260 mA at 24 V typ. at nominal load
Internal current drain	350 mA at 5 V	350 mA at 5 V
max. vectorial sum current for bus terminals	1650 mA at 5 V	650 mA at 5 V
Power contacts	3; 24 VDC (-15 %...+20 %)	none
Current via power contacts	max. 10 A	-



PROFIBUS DP

	PIO-333 Standard	PIO-343 ECO
Signals	digital and analog	digital and analog
max. number of couplers in the system	96 with repeater	125 with repeater
Number of I/O points	Approx. 6000 (depending on the master)	Approx. 6000 (depending on the master)
Transfer medium	Copper cable as per EN 50170	Copper cable as per EN 50170
max. bus length	100...1200 m depending on cable and baud rate	100...1200 m depending on cable and baud rate
Transfer rate	9.6 kBauds...12 MBauds	9.6 kBauds...12 MBauds
Transmission time	typ. 1 ms, max. 3.3 ms	typ. 1 ms, max. 3.3 ms
max. number of bus terminals	63	63
Fieldbus input process image	max. 128 bytes	max. 32 bytes
Fieldbus output process image	max. 128 bytes	max. 32 bytes
Supply voltage	24 VDC (-15 %...+20 %)	24 VDC (-15 %...+20 %)
Input current	max. 500 mA at 24 V	260 mA at 24 V typ. at nominal load
Internal current drain	200 mA at 5 V	350 mA at 5 V
max. vectorial sum current for bus terminals	1800 mA at 5 V	650 mA at 5 V
Power contacts	3; 24 VDC (-15 %...+20 %)	none
Current via power contacts	max. 10 A	-



DeviceNet™

	PIO-306 Standard	PIO-346 ECO
Signals	digital and analog	digital and analog
max. number of couplers in the system	64 with scanner	64 with scanner
Number of I/O points	Approx. 6000 (depending on the master)	Approx. 6000 (depending on the master)
Transfer medium	screened copper cable trunk line: 2x0.82 mm ² + 2x1.7 mm ² drop line: 2x0.2 mm ² + 2x0.32 mm ²	screened copper cable trunk line: 2x0.82 mm ² + 2x1.7 mm ² drop line: 2x0.2 mm ² + 2x0.32 mm ²
max. bus length	100...500 m depending on cable and baud rate	100...500 m depending on cable and baud rate
Transfer rate	125 - 250 - 500 kBauds	125 - 250 - 500 kBauds
max. number of bus terminals	64	63
Fieldbus input process image	max. 512 bytes	max. 32 bytes
Fieldbus output process image	max. 512 bytes	max. 32 bytes
Supply voltage	24 VDC (-15 %...+20 %)	24 VDC (-15 %...+20 %)
Input current	<500 mA at 24 V	260 mA at 24 V typ. at nominal load
DeviceNet Interface	<120 mA at 11 V	<120 mA at 11 V
Internal current drain	350 mA at 5 V	350 mA at 5 V
max. vectorial sum current for bus terminals	1650 mA at 5 V	650 mA at 5V
Power contacts	3; 24 VDC (-15 %...+20 %)	none
Current via power contacts	max. 10 A	-



ETHERNET TCP/IP

	PIO-341 Standard
Signals	digital and analog
max. number of socket connections	3 HTTP, 5 MODBUS/TCP, 128 for ETHERNET/IP
Number of I/O modules	limited by ETHERNET specification
Transfer medium	Twisted Pair S-UTP 100 Ω CAT 5
max. bus length	100 m between hub and PIO-341; max. network length is limited by the ETHERNET specification
Transfer rate	10/100 Mbits/s
max. number of bus terminals	64
Fieldbus input process image	max. 2 kBytes
Fieldbus output process image	max. 2 kBytes
Supply voltage	24 VDC (-15 %...+20 %)
Input current	500 mA at 24 V
Internal current drain	300 mA at 5 V
max. vectorial sum current for bus terminals	1700 mA at 5 V
Power contacts	3; 24 VDC (-15 %...+20 %)
Current via power contacts	max. 10 A

ECO fieldbus couplers are used in situations where mainly digital inputs and outputs are to be connected and the number of analogue inputs and outputs is small.

The system is supplied directly via the coupler. The field supply is connected via a separate input terminal (PIO-602).

Bus Terminals



Digital inputs

	PIO-400 2DI 24 VDC 3.0 ms 2-channel digital input terminal	PIO-402 4DI 24 VDC 3.0 ms 4-channel digital input terminal	PIO-430 8DI 24 VDC 3.0 ms 8-channel digital input terminal
Number of inputs	2	4	8
Data width of the process image	2 Bits	4 Bits	8 Bits
Connection	2 - 4 wires, positive switching	2 - 3 wires, positive switching	single-wire, positive switching
Power contacts	3; 24 VDC (-15 %...+20 %)	2; 24 VDC (-15 %...+20 %)	2; 24 VDC (-15 %...+20 %)
Internal current drain	3.7 mA at 5 V	7.5 mA at 5 V	17 mA at 5 V
Signal voltage (0)	-3...+5 VDC	-3...+5 VDC	-3...+5 VDC
Signal voltage (1)	15...30 VDC	15...30 VDC	15...30 VDC
Input current (typ.)	4.5 mA	4.5 mA	2.8 mA
Dimensions (mm) WxHxD	12x64x100	12x64x100	12x64x100



Analog inputs

	PIO-456 2AI ±10 VDC differential input 2-channel analog input terminal	PIO-468 4AI 0-10 VDC S.E. 4-channel analog input terminal	PIO-480 2AI 0-20 mA differential input 2-channel analog input terminal
Number of inputs	2	4	2 (opto-isolated)
Data width of the process image	2*2 bytes	4*2 bytes	2*2 bytes
Connection	differential input	Single-ended	differential input
Power contacts	none	none	none
Internal current drain	80 mA at 5 V	60 mA at 5 V	<100 mA at 5 V
Signal input	±10 V	0...10 V	0...20 mA
Resolution	12 bits	12 bits	14 bits (A/D converter) 13 bits (measurement value)
Dimensions (mm) WxHxD	12x64x100	12x64x100	12x64x100



Digital outputs

	PIO-501 2DO 24 VDC 0.5 A 2-channel digital output terminal	PIO-504 4DO 24 VDC 0.5 A 4-channel digital output terminal	PIO-530 8DO 24 VDC 0.5 A 8-channel digital output terminal
Number of outputs	2	2	4
Data width of the process image	2 bits	4 bits	8 bits
Connection	short-circuit proof, positive switching	short-circuit proof, positive switching	short-circuit proof, positive switching
Power contacts	3; 24 VDC (-15 %...+20 %)	2; 24 VDC (-15 %...+20 %)	2; 24 VDC (-15 %...+20 %)
Internal current drain	3.5 mA at 5 V	7 mA at 5 V	25 mA at 5 V
Type of load	resistive, inductive, lamp load	resistive, inductive, lamp load	resistive, inductive, lamp load
Output current	0.5 A	0.5 A	0.5 A
Switching frequency (max.)	5 kHz	5 kHz	1 kHz
Dimensions (mm) WxHxD	12x64x100	12x64x100	12x64x100



Analog outputs

	PIO-550 2AO 0-10 VDC 2-channel analog output terminal	PIO-552 2AO 0-20 mA 2-channel analog output terminal	PIO-556 2AO ±10 VDC 2-channel analog output terminal
Number of outputs	2	2	2
Data width of the process image	2*2 bytes	2*2 bytes	2*2 bytes
Power contacts	none	2; 24 VDC (-15 %...+20 %)	none
Signal input	0...10 V	0...20 mA	±10 V
Internal current drain	65 mA at 5 V	60 mA at 5 V	65 mA at 5 V
Resolution	12 bits	12 bits	12 bits
Conversion time	Approx. 2ms	Approx. 2ms	Approx. 2ms
Load impedance	> 5 kOhm	< 500 Ohm	> 5 kOhm
Dimensions (mm) WxHxD	12x64x100	12x64x100	12x64x100

Power Supply Terminal

The power supply terminal is used to supply the field level when ECO couplers are used or if the supply is interrupted by bus terminals with no or only a single power contact.

Passive power supply terminal

	PIO-602
Voltage via power contacts	24 VDC (-15 %...+20 %)
Current via power contacts	max. 10 A

Bus Terminal

PIO-600: A terminal must be set at the end of each fieldbus node. The terminal closes the internal terminal bus and ensures correct data transmission.

Layout and Configuration Setup

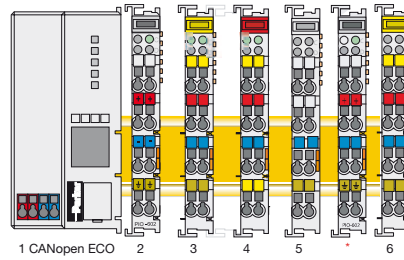
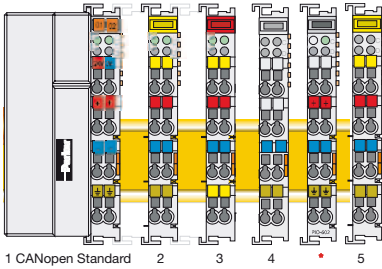
Example of a layout sequence (from left to right):

with standard coupler

1. Fieldbus coupler
2. Bus terminals with 3 power contacts
3. Bus terminals with 2 power contacts
4. Bus terminals without power contacts
5. *

with ECO coupler

1. ECO fieldbus coupler
2. PIO-602
3. Bus terminals with 3 power contacts
4. Bus terminals with 2 power contacts
5. Bus terminals without power contacts
6. *



* Expansion on the right side using bus terminals with power contacts requires the use of a PIO-602 potential voltage feed terminal.

Worked examples

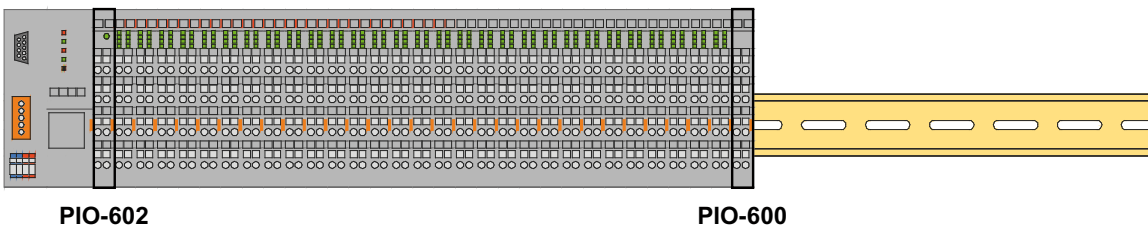
The data for the input currents must be available to calculate the vectorial sum!
The internal current drain of the bus terminals is specified in the technical data. The values of all PIOs in the node are added together to determine the total requirement.

Example 1

The following components are to be used in a node:

- 1 CANopen ECO coupler (PIO-347)
- 16 digital output terminals (PIO-530)
- 14 digital input terminals (PIO-430)

PIO-347 internal current drain	350 mA at 5 V
PIO-347 max. vectorial sum current for bus terminals	650 mA at 5V
Grand total I (5 V):	
	1000 mA at 5 V
PIO-347 fieldbus input process image	max. 32 bytes
PIO-347 fieldbus output process image	max. 32 bytes
PIO-530 internal current drain	16*25 mA = 400 mA
PIO-430 internal current drain	14*17 mA = 238 mA
Total:	
	638 mA
PIO-530 data width of the output process image	16*8 bits = 128 bits (16 bytes)
PIO-430 data width of the input process image	14*8 bits = 112 bits (14 bytes)



The **CANopen ECO coupler** (PIO-347) is capable of providing the required 638 mA (max. 650 mA) for the bus terminals. It is capable of administering a data width of 14 bytes for the input process image (max. 32 bytes) and a data width of 16 bytes for the output process image (max. 32 bytes). (A PIO-602 power supply terminal is required).

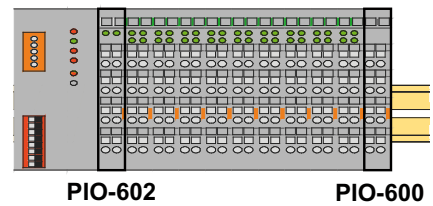
Example 2

The following components are to be used in a node:

- 1 CANopen ECO coupler (PIO-347)
- 9 analog input terminals (PIO-468)

PIO-347 internal current drain	350 mA at 5 V
PIO-347 max. vectorial sum current for bus terminals	650 mA at 5V
Grand total I (5 V):	1000 mA at 5 V
PIO-347 fieldbus input process image	max. 32 bytes
PIO-347 fieldbus output process image	max. 32 bytes
PIO-468 internal current drain	9*60 mA = 540 mA
Total:	540 mA
PIO-468 data width of the output process image	9*8 bytes = 72 bytes

The **CANopen ECO coupler** (PIO-347) is capable of providing the required 540 mA (max. 650 mA) for the bus terminals. However, this version requires the use of a **CANopen Standard coupler** (PIO-337), since the required data width of 72 bytes for the input process image cannot be administered by the CANopen ECO coupler (max. 32 bytes). The CANopen standard coupler (PIO-337) is capable of administering an input process image of 512 bytes. (No PIO-602 power supply terminal is required).

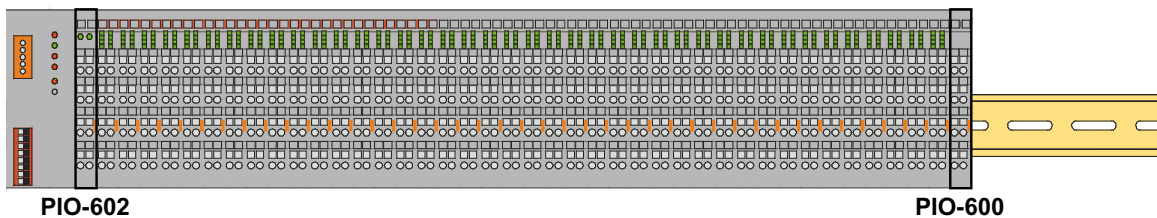


Example 3:

The following components are to be used in a node:

- 1 CANopen ECO coupler (PIO-347)
- 16 digital output terminals (PIO-530)
- 24 digital input terminals (PIO-430)

PIO-347 internal current drain	350 mA at 5 V
PIO-347 max. vectorial sum current for bus terminals	650 mA at 5V
Grand total I (5 V):	1000 mA at 5 V
PIO-347 fieldbus input process image	max. 32 bytes
PIO-347 fieldbus output process image	max. 32 bytes
PIO-530 internal current drain	16*25 mA = 400 mA
PIO-430 internal current drain	24*17 mA = 408 mA
Total:	808 mA
PIO-530 data width of the output process image	16*8 bits = 128 bits (16 bytes)
PIO-430 data width of the input process image	14*8 bits = 112 bits (14 bytes)

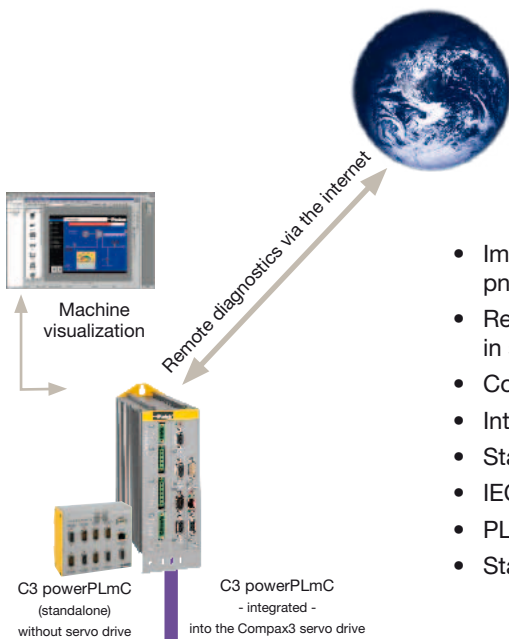


The **CANopen ECO coupler** (PIO-347) is capable of administering a data width of 14 bytes for the input process image (max. 32 bytes) and a data width of 16 bytes for the output process image (max. 32 bytes). This version requires the use of the **CANopen standard coupler** (PIO-337) since the total of currents is exceeded. The CANopen standard coupler (PIO-337) is capable of providing 1650 mA for bus terminals and can administer an input and output process image of 512 bytes each. (No PIO-602 power supply terminal is required).

System Solutions from Parker Hannifin

Integrating Drive Technology into the Automation Environment

- High-performance control systems
- Pneumatic and hydraulic drives
- Sensor systems
- Input/output modules
- Operator panels for control and monitoring
- Technology functions (winders, cams, etc.)
- Vertical integration (connection to company networks, remote maintenance, etc.)
- Handling and precision mechanics



- Implementation of modular machine concepts with electromechanics, pneumatics and hydraulics
- Relieves the logic and motion function load on the main control system (can in some instances remove the need for the main control system)
- Control, NC functionality and monitoring in a single device
- Integration into control systems and remote maintenance via the Internet
- Standard components make it easy to expand the system
- IEC 61131-3
- PLCopen motion components
- Standard fieldbusses

CANopen (Sync Telegram)



Features

- 5 programming languages
 - SFC (Sequential function chart)
 - IL (Instruction List)
 - ST (Structured Text)
 - LD (Ladder diagram)
 - FBD (Function block diagram)
 - CFC (Continuous function chart editor)
- Compax3 library
 - IEC - standard components
 - Compax3 - specific components
 - PLCopen Motion control components
 - Technology components

Order Code

Parker I/O System - PIO

	1		2
Order example	PIO	-	337

1 Series

PIO Parker I/O system

2 Fieldbus coupler

- 337** CANopen coupler
- 347** CANopen coupler ECO
- 306** DeviceNet coupler
- 346** DeviceNet coupler ECO
- 333** PROFIBUS coupler (DP/V1 12 MBd)
- 343** PROFIBUS coupler ECO (DP 12 MBd)
- 341** ETHERNET coupler (TCP/IP)

Bus terminals

Digital inputs

- 400** 2DI 24 VDC 3.0 ms
- 402** 4DI 24 VDC 3.0 ms
- 430** 8DI 24 VDC 3.0 ms

Analog inputs

- 456** 2AI ±10 VDC differential input
- 468** 4AI 0-10 VDC S.E.
- 480** 2AI 0-20 mA differential input

Digital outputs

- 501** 2DO 24 VDC 0.5 A
- 504** 4DO 24 VDC 0.5 A
- 530** 8DO 24 VDC 0.5 A

Analog outputs

- 550** 2AO 0-10 VDC
- 552** 2AO 0-20 mA
- 556** 2AO ±10 VDC

System terminals

- 600** Bus terminal
(required as terminal for each fieldbus node)
- 602** Power supply terminal 24 VDC

Accessories

PIO quick designation system

(designation indicators for manual labeling)

- 501-WEISS **white**
- 501-GELB **yellow**
- 501-ROT **red**
- 501-BLAU **blue**
- 501-GRAU **grey**
- 501-ORANGE **orange**
- 501-HELLGRUEN **light green**

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

- 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

- CO₂ 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

Parker Worldwide

Europe, Middle East, Africa

AE – United Arab Emirates, Dubai
Tel: +971 4 8127100
parker.me@parker.com

AT – Austria, Wiener Neustadt
Tel: +43 (0)2622 23501-0
parker.austria@parker.com

AT – Eastern Europe, Wiener Neustadt
Tel: +43 (0)2622 23501 900
parker.easteurope@parker.com

AZ – Azerbaijan, Baku
Tel: +994 50 2233 458
parker.azerbaijan@parker.com

BE/LU – Belgium, Nivelles
Tel: +32 (0)67 280 900
parker.belgium@parker.com

BY – Belarus, Minsk
Tel: +375 17 209 9399
parker.belarus@parker.com

CH – Switzerland, Etoy
Tel: +41 (0)21 821 87 00
parker.switzerland@parker.com

CZ – Czech Republic, Klecany
Tel: +420 284 083 111
parker.czechrepublic@parker.com

DE – Germany, Kaarst
Tel: +49 (0)2131 4016 0
parker.germany@parker.com

DK – Denmark, Ballerup
Tel: +45 43 56 04 00
parker.denmark@parker.com

ES – Spain, Madrid
Tel: +34 902 330 001
parker.spain@parker.com

FI – Finland, Vantaa
Tel: +358 (0)20 753 2500
parker.finland@parker.com

FR – France, Contamine s/Arve
Tel: +33 (0)4 50 25 80 25
parker.france@parker.com

GR – Greece, Athens
Tel: +30 210 933 6450
parker.greece@parker.com

HU – Hungary, Budaörs
Tel: +36 23 885 470
parker.hungary@parker.com

IE – Ireland, Dublin
Tel: +353 (0)1 466 6370
parker.ireland@parker.com

IT – Italy, Corsico (MI)
Tel: +39 02 45 19 21
parker.italy@parker.com

KZ – Kazakhstan, Almaty
Tel: +7 7273 561 000
parker.easteurope@parker.com

NL – The Netherlands, Oldenzaal
Tel: +31 (0)541 585 000
parker.nl@parker.com

NO – Norway, Asker
Tel: +47 66 75 34 00
parker.norway@parker.com

PL – Poland, Warsaw
Tel: +48 (0)22 573 24 00
parker.poland@parker.com

PT – Portugal, Leca da Palmeira
Tel: +351 22 999 7360
parker.portugal@parker.com

RO – Romania, Bucharest
Tel: +40 21 252 1382
parker.romania@parker.com

RU – Russia, Moscow
Tel: +7 495 645-2156
parker.russia@parker.com

SE – Sweden, Spånga
Tel: +46 (0)8 59 79 50 00
parker.sweden@parker.com

SK – Slovakia, Banská Bystrica
Tel: +421 484 162 252
parker.slovakia@parker.com

SL – Slovenia, Novo Mesto
Tel: +386 7 337 6650
parker.slovenia@parker.com

TR – Turkey, Istanbul
Tel: +90 216 4997081
parker.turkey@parker.com

UA – Ukraine, Kiev
Tel: +380 44 494 2731
parker.ukraine@parker.com

UK – United Kingdom, Warwick
Tel: +44 (0)1926 317 878
parker.uk@parker.com

ZA – South Africa, Kempton Park
Tel: +27 (0)11 961 0700
parker.southafrica@parker.com

North America

CA – Canada, Milton, Ontario
Tel: +1 905 693 3000

US – USA, Cleveland
Tel: +1 216 896 3000

Asia Pacific

AU – Australia, Castle Hill
Tel: +61 (0)2-9634 7777

CN – China, Shanghai
Tel: +86 21 2899 5000

HK – Hong Kong
Tel: +852 2428 8008

IN – India, Mumbai
Tel: +91 22 6513 7081-85

JP – Japan, Tokyo
Tel: +81 (0)3 6408 3901

KR – South Korea, Seoul
Tel: +82 2 559 0400

MY – Malaysia, Shah Alam
Tel: +60 3 7849 0800

NZ – New Zealand, Mt Wellington
Tel: +64 9 574 1744

SG – Singapore
Tel: +65 6887 6300

TH – Thailand, Bangkok
Tel: +662 186 7000-99

TW – Taiwan, Taipei
Tel: +886 2 2298 8987

South America

AR – Argentina, Buenos Aires
Tel: +54 3327 44 4129

BR – Brazil, Sao Jose dos Campos
Tel: +55 800 727 5374

CL – Chile, Santiago
Tel: +56 2 623 1216

MX – Mexico, Apodaca
Tel: +52 81 8156 6000



EMEA Product Information Centre

Free phone: 00 800 27 27 5374

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