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The Bosch Servodyn D Drive System

Fully digital drive technology for decisively superior dynamic response and precision

BOSCH
Automation

Consistently modular – a reliable hedge against obsolescense

Bosch Servodyn D is the embodiment of a 100% digital design concept. Uniformly modular structures extend from the supply and drive modules all the way to the output amplifier circuits and microprocessor cards, endowing this new drive concept for synchronous and asynchronous motors with enhanced flexibility while simultaneously facilitating future updates, letting you adapt your system's technology to keep pace with advancing technology. 100% digital closed-loop control for all process levels and high cycle frequency maintain extreme precision and consistent performance, even in the face of temperature fluctuations and long-term wear.

Three options to choose from

Bosch offers Servodyn D in three different configurations: with compact-format mechanical components for standard performance ranges, with folding or plug-in mechanical units, and with integral module links for high-performance applications. These options can be variously combined to produce inexpensive units to satisfy specific individual needs.

Narrow stand-alone converters including supply unit, ballast switch, buffer circuit capacitors and axis converter in a single housing provide maximum performance at minimal cost for single-axis applications. The option of incorporating a DC link circuit facilitates optimal utilisation of ballast potential for braking. The „flat and narrow“ book formats common to all versions fit in any control cabinet, even shallow compact units with an insertion depth of only 300 mm.

Projectable processor power, predictable communications

A range of processor cards is available for maintaining communications between the control circuit and drive unit. These cards are designed for use in all mechanical module versions.

SERCOS interface

The SERCOS interface copes easily with extreme performance demands. The specific advantages of this interface include real-time processing, interference-resistant fibre-optics communications and the ability to combine drive and control systems from different producers within single systems. The microprocessor card is equipped with a high-performance 32-bit signal processor for closed-loop digital control of position, rpm and current.

CAN data bus

Yet another cost-effective control option is provided by our own Bosch-developed CAN bus system. Available protocols include the Bosch CAN Protocol, already a successful veteran of years of use, along with the international CAN-open standard, allowing trouble-free integration of additional sensors and final-control elements within the bus system.

± 10 V analogue

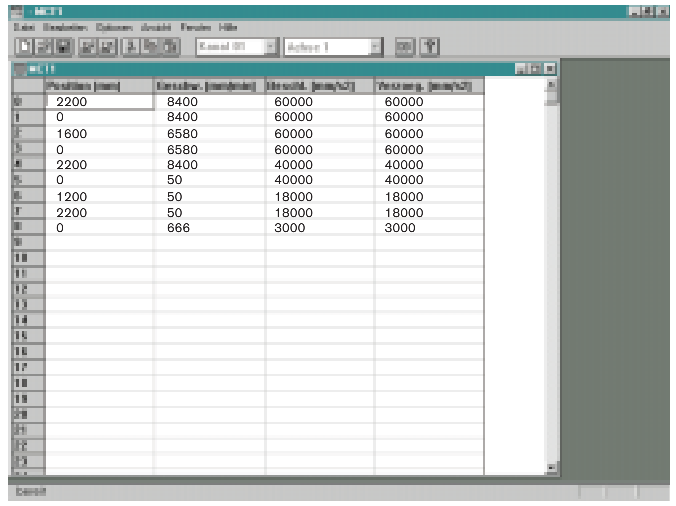
Triggering circuits relying on nominal analogue command values of ± 10V are available for satisfying „classical“ standard operating requirements. The corresponding microprocessor card features an ASIC for digital rpm and current control. This intelligent communications concept combines with a modular mechanical layout to allow configurations including various bus and interface systems for controlling a limited number of axes or for operating auxiliary axes with SPS.

SERCOS interface

CAN databus

Motion Control for standard positioning operations

We have opened the way to inexpensive decentralised design concepts by integrating the control functions within the drive system. Servodyn D's data-storage memory can accomodate up to 32 positioning command sets including end position, acceleration rate, deceleration and maximum velocity. This makes it possible to define precise point-to-point moition as well as absolute and incremental travel.



Motion Control

An array of options for feedback interrace

Graduated-response motor monitoring systems adapt measuring precision to fit the actual requirements.

Therefore, Servodyn converters can employ various modules to interpret data from an extended range of sensory systems, while a special option card allows analogue output of travel measurements. In addition, converters with an analogue interface also include integrated encoder simulation as standard equipment.

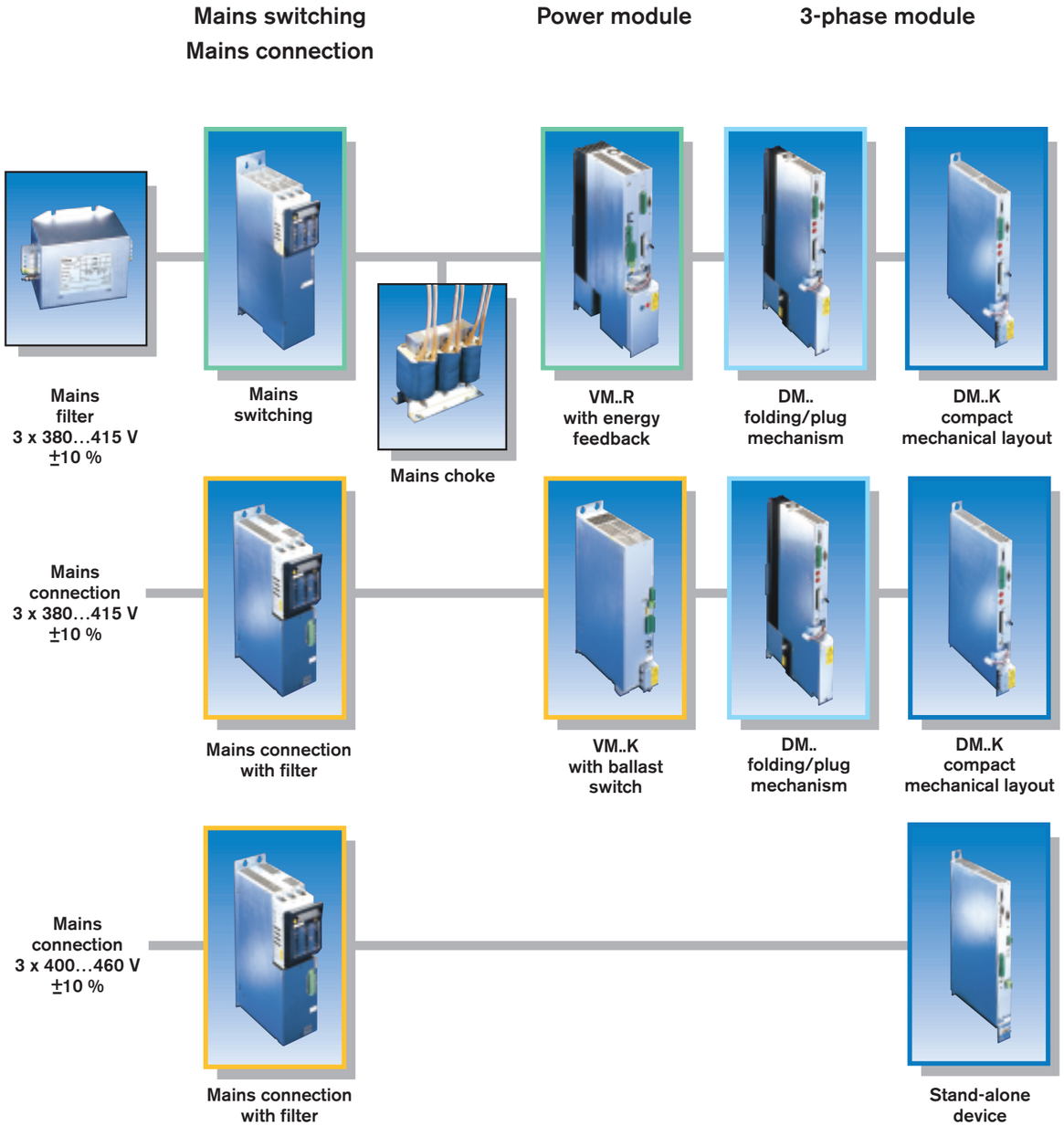
Electronic data plate

The converter's IGBT amplifier circuit and the attached motor each contain an integrated EEPROM – used to store the required operating data. The drive-control microprocessor automatically adapts the closed-loop motion control's operating parameters to reflect the system's combination of motor and module. Rapid identification of drive system components eases service and maintenance.

Reliability through redundance

The redundant safety concept provides a reliable backup to monitor the drive system during set-up operations, without the need for a second direct monitoring system. The motion-control system achieves full compliance with EN 954-1 by incorporating all of the functions defined in Category 3, making additional monitoring devices unneccessary. Extensive security functions covering such areas as voltage, current, temperature, short-circuit and grounding protection are all incorporated. The resulting high level of system reliability ensures trouble-free operation with cable lengths of up to 100 m, even without additional electronic devices.

Bosch Servodyn D: Configuration



Operating features

Interface/ bus system	Functions \ Motor versions / Feedback systems	SF Series Servo motors Single-Turn Absolute (STG) Multi-Turn Absolute (MTG)	SR series Servo motors Resolver	DU series asynchronous 3-phase motors Single-Turn Absolute (STG)	Standard asyn-cronous 3-phase motors with high frequency spindles Sensorless	Modular motors with high-fre-quency spindles Toothed rotor sensor	Linear motors LC 181 Length code monitoring system
SERCOS interface	Closed-loop RPM control Position control with high-resolution interpolation Position specification	●		●		●	●
CAN bus	Closed-loop RPM control Position control with high-resolution interpolation	●	●	●		●	
Analogue interface ± 10 V	Closed-loop RPM control Force control	●	●	●		●	
Analogue interface ± 10 V	Open-loop RPM control				●		
24 V input/output	Motion Control: 32-point position control	●	●	●		●	

Bosch Servodyn D: SF and SR servo motors

Standard features

- IM 5B layout
- Smooth shaft
- Vibration rating N
- Protection Class IP67, without flange
- Electronic data plate

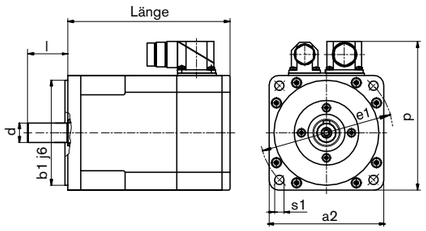
Options

- Shaft with key and keyway
- Flange seal
- Vibration ratings R, S
- Holding brake
- Externally cooled versions
- Various revolution rates

Motor type	Sensor type	Precision level	Resolution
SF	Single-turn (STG) Optional Multi-turn (MTG)	± 20 angular seconds	8 mio. incr./R
SR	Resolver	± 10 angular minutes	8192 lincr./R

S □ – A 2 0026 060 – 10 000

- **Brushless servomotor with sine-wave EMF**
- Design index
- Size
- Stationary torque as per table
- RPM mode
  e. g., 060 → n_N = 6000 min^{-1}
- Optionen: 10 = Standard configuration
  smooth shaft, without counterplug
  14 = Standard configuration with motion brake
  (refer to motor manual for additional information)
- Version



□ = S1, cycle frequency 2 kHz
■ = S1, cycle frequency up to 4 kHz
■ = S1, cycle frequency up to 8 kHz

SF and SR servo motors	Rated rotation speed	Stationary torque	Stationary current	Dimensions					Length without brake	Length with brake	Height	Inertia with sensor	Brake (24 V DC ± 10%)			Mass		Plug size Wire cross section	Motor/module combinations for maximum continuous load facors)								
				Shaft	Flange														DM.. 4K	DM.. 8K	DM.. 15K	DM.. 30K	DM.. 30A	DM.. 45A	DM.. 85B	DM.. 140D	DS.. 15K
	n_N [min^{-1}]	M_0 [N_m]	I_0 [A_{eff}]	Ø d k5 x l [mm]	a2 [mm]	b1 [mm]	e1 [mm]	s1 [mm]	[mm]	[mm]	P [mm]	J [10^{-4} kgm^2]	M_{Bf} [Nm]	I_{Bc} [A]	J_{Br} [10^{-4} kgm^2]	Motor [kg]	Brake [kg]										
SF(R)-A5.0250.020 SF(R)-A5.0460.020 SF(R)-A5.0700.020	2000	24 46 70	11 21 35	32 x 58	190	180	215	13,5	300 383 483	345 428 528	240	83 166 257	56	1,5	45	24 35 50	5,2	1,25 / 4 x 1,5 1,25 / 4 x 4,0 1,5 / 4 x 10					■ □	■ ■	■ ■	■ ■	
SF(R)-A2.0013.030 SF(R)-A2.0020.030 SF(R)-A2.0026.030 SF(R)-A2.0041.030	3000	1,3 2,0 2,6 4,1	0,9 1,3 1,7 2,7	14 x 30	100	95	115	8,5	186 198 208 233	206 217 229 253	142	2 3 4 6	3,5	0,7	1,1	4,0 5,5 6,2 7,1	0,7	1 / 4 x 1,5	■ ■ ■ ■	■							■ ■ ■ ■
SF(R)-A3.0042.030 SF(R)-A3.0068.030 SF(R)-A3.0093.030		4,2 6,5 9,3	3,0 4,8 6,6	19 x 40	116	110	130	9	223 255 287	262 294 326	156	7 11 16	8,0	0,8	1,2	7,0 9,0 12,0	0,7	1 / 4 x 1,5	■ ■ □	■ ■ □	■ ■ ■	■ ■	■				■ ■ ■
SF(R)-A4.0091.030 SF(R)-A4.0125.030 SF(R)-A4.0172.030 SF(R)-A4.0230.030		10 12 17 23	6,8 9,1 13 16	24 x 50	142	130	165	11,5	246 277 309 341	293 324 356 388	180	21 30 40 54	18	1	9	13 16 19 25	1,7	1 / 4 x 1,5 1 / 4 x 1,5 1 / 4 x 1,5 1 / 4 x 2,5		□	■ ■ ■ □	■ ■ ■ □	■ ■ ■ ■	■ ■	■		■ □
SF(R)-A5.0250.030 SF(R)-A5.0460.030 SF(R)-A5.0700.030		25 46 70	18 33 47	32 x 58	190	180	215	13,5	300 383 483	345 428 528	240	83 166 257	56	1,5	45	24 35 50	5,2	1,25 / 4 x 4,0 1,5 / 4 x 10 1,5 / 4 x 16				□	■	■	■ ■	■	
SR -A0.0002.060 SR -A0.0004.060 SR -A0.0008.060 SR -A0.0009.060	6000	0,2 0,4 0,8 0,9	0,4 0,8 1,3 2,0	9 x 20	55	40	63	5,5	126 141 156 171	160 175 190 205	90	0,06 0,09 0,15 0,18	1	0,5	0,068	1 1,2 1,3 1,6	0,18	1/4 x 1,5	■ ■ ■ ■								■ ■ ■ ■
SR -A1.0008.060 SR -A1.0012.060 SR -A1.0016.060 SR -A1.0023.060		0,8 1,2 1,6 2,3	1,3 2,0 2,4 3,4	11 x 23	70	60	75	5,5	156 176 196 236	200 220 240 280	102	0,43 0,63 0,83 1,20	2	0,4	0,12	1,4 1,9 2,1 2,6	0,21	1/4 x 1,5	■ ■ ■ ■								■ ■ ■ ■
SF(R)-A2.0013.060 SF(R)-A2.0020.060 SF(R)-A2.0026.060 SF(R)-A2.0041.060		1,3 2,0 2,7 4,1	1,7 2,7 3,5 5,6	14 x 30	100	95	115	8,5	186 198 208 233	206 217 229 253	142	2 3 4 6	3,5	0,7	1,1	4,0 5,5 6,2 7,1	0,7	1 / 4 x 1,5	■ ■ ■ ■	■ ■ ■	■ ■	■					■ ■ ■ ■
SF(R)-A3.0042.060 SF(R)-A3.0068.060 SF(R)-A3.0093.060		4,2 6,8 9,3	6,0 10 14	19 x 40	116	110	130	9	223 255 287	262 294 326	156	7 11 16	8,0	0,8	1,2	7,0 9,0 12,0	0,7	1 / 4 x 1,5 1 / 4 x 1,5 1 / 4 x 2,5		□	■ ■	■	■ ■	■ ■	■		■ □
SF(R)-A4.0091.060 SF(R)-A4.0125.060 SF(R)-A4.0172.060 SF(R)-A4.0230.060		9,1 12 17 22	14 17 26 25	24 x 50	142	130	165	11,5	246 277 309 341	293 324 356 388	191	21 30 40 54	18	1	9	13 16 19 25	1,7	1,25 / 4 x 2,5 1,25 / 4 x 2,5 1,25 / 4 x 6,0 1,25 / 4 x 6,0				■ □	■ ■	■ □ □	■ ■	■	

Bosch Servodyn D:
DU asynchronous 3-phase motors

Standard features

- IM B35 layout
- Size 180 in IM B3
- Smooth shaft
- Vibration severity rating R
- Flange alignment precision rating N
- Protection Class IP 54
- STG absolute value encoder
- Temperature monitored by 2 NTC sensors
- Electronic data plate
- Top-mounted terminal box rotates 4 x 90

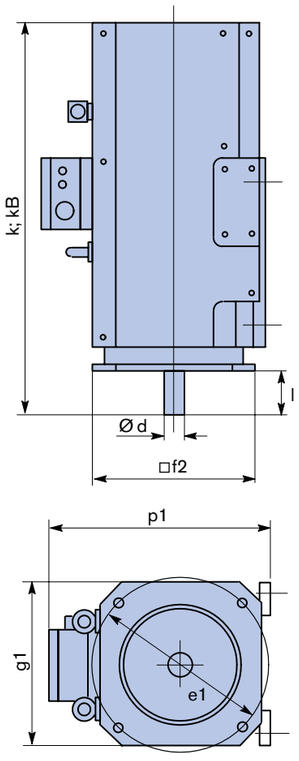
Options

- Higher IP 55 protection class rating (IEC 34-5)
- Shaft with key and keyway
- Oil-tight input end plate
- Higher rotation rates
- Vibration severity ratings S, S1, S2, S3 as defined in DIN VDE 0530-14 (not available with holding brake)
- High-precision flange alignment rating R
- Holding brake
- Side-mounted terminal box

Motor type	Sensor type	Precision	Resolution
DU	Single-turn (STG)	± 20 angular seconds	8 mil. incr./R

■ = S1, cycle frequency 4 kHz
■ = S1, cycle frequency 4 kHz or 8 kHz
● = S6-60 %, cycle frequency 4 kHz
● = S6-60 %, cycle frequency 4 kHz or 8 kHz
▲ = S6-40 %, cycle frequency 4 kHz
▲ = S6-40 %, cycle frequency 4 kHz or 8 kHz

Size	DU asynchronous 3-phase motor	Nominal rated power P_N [kW]	Rotation rate range n_N-n_{max} [min^{-1}]	Nominal rated torque M_N [Nm]	Nominal rated torque I_N [A]	Motor/module combination				
						DM.. 30K	DM.. 30A	DM.. 45A	DM.. 85B	DM.. 140D
90	90 L	4,2	1800 – 9000 (15000)	22	11	■ ●	■ ● ▲	■ ● ▲		
100	100 M 100 L 100 U	6,6 9,0 12	1800 – 9000 (15000)	35 48 63,5	15,5 20 25		■ ●	■ ● ▲ ■ ●	■ ● ▲ ■ ● ▲ ■ ● ▲	■ ● ▲
132	132 S 132 M 132 L	15 18,5 22	1500 – 6500 (12000)	95,5 118 140	29 37 42				■ ● ▲ ■ ● ■ ●	■ ● ▲ ■ ● ▲ ■ ● ▲
160	160 S 160 M 160 L	30 37 45	1500 – 6000 (12000)	191 235 286	51 63 76					■ ● ▲ ■ ● ▲ ■ ●



DU B 132M 065-100 / 4 G 35 S 0000 □

Asynchronous motor for Servodyn D
□ = motor without brake
B = with brake, closed-circuit concept

Dimensions, length
S = Short L = Long
M = Medium U = Extended-length

Maximum rotation rate, e.g., 065 = 6500 min^{-1}

Cut-off frequency in Hz

Terminal number

Sensor
G = Standard sensor (RCN 1313)
Z = Toothed-rotor sensor

Basic configurations IM B3, IM B5, IM B35 (also applicable as IM V15)

S = Suction ventilation AS → BS (standard)
B = Blower ventilation BS → AS
F = Fluid cooled

1st digit:
0 = Deep-groove ball bearing, vibration intensity rating R
1 = Deep-groove ball bearing, vibration intensity rating S
2 = Deep-groove ball bearing, vibration intensity rating S1
3 = High-precision spindle bearing, vibration intensity rating S
4 = High-precision spindle bearing, vibration intensity rating S1
5 = High-precision spindle bearing, vibration intensity rating S2
6 = High-precision spindle bearing, vibration intensity rating S3
7 = High-precision spindle bearing, vibration intensity rating R

2nd digit:
0 = Solid shaft, smooth, balance with smooth shaft
1 = Solid shaft, slot and key, balance with complete slot key
2 = Solid shaft, slot and key, balance with helf slot key
3 = Solid shaft, slot and key, balance without slot key
4 = Hollow shaft, smooth, balance with smooth shaft
5 = Example: Special slot key

3rd digit:
0 = without oil-tight input end plate, without gearset
1 = with oil-tight input end plate
2 = with gearset
3 = with oil-tight end plate, with gearset

4th digit:
0 = Top-mounted terminal box
1 = Right-mounted terminal box
2 = Left-mounted terminal box

Design index: □ = standard

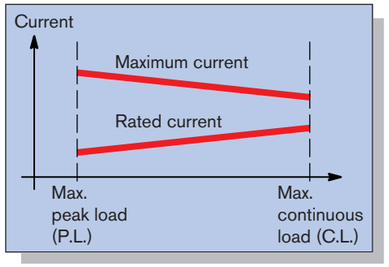
Size	DU asynchronous 3-phase motors	Shaft Ø d x l [mm]	Flange f 2 [mm]	Flange e 1 [mm]	Length k [mm]	Length k_B [mm]	Width g 1 [mm]	Height p 1 [mm]	Inertia- J [10^{-3} kg m^2]	Mass [kg]
90	90 L	28 x 60	160	165	523	590	185	257	5,55	37
100	100 M 100 L 100 U	38 x 80	190	215	610 675 740	685 750 815	208	277	18,4 24,2 29,1	53 64 73
132	132 S 132 M 132 L	42 x 110	260	300	720 770 820	816 866 916	276	356	82,7 101 119	115 133 144
160	160 S 160 M 160 L	55 x 110	316	350	910 975 1040	977 1042 1107	327	428	251 304 356	230 265 295

Bosch Servodyn D: 3-phase modules

General specifications

Operating temperature	0 to +45 °C 0 to +55 °C wirh derating
Storage temperature	–25 to +70 °C
Protection rating	IP 20 as defined in EN 60 529
Climate class	3K3 as defined in EN 60721, no condensation
Installation height	≤ 1000 m above sea level; derating up to 3000 m above sea level

Maximum current band width



	DM...K (also available as DM..A)								DM..A, B, D							
Module type	DM..4K		DM..8K		DM..15K		DM..30K		DM..30A		DM..45A		DM..85B		DM..140D	
Maximum current band width	max. PL	max. CL	max. PL	max. CL	max. PL	max. CL	max. PL	max. CL	max. PL	max. CL	max. PL	max. CL	max. PL	max. CL	max. PL	max. CL
DC link voltage	670 VDC, regulated															
f_S = 2 kHz Maximum current [A_{eff}] Rated current [A_{eff}]	7,3 2,0	6,6 4,7	11 3,0	10 7,1	18 6,5	17 13	34 7,8	25 18	35 11	30 21	53 12	43 27	98 27	74 55	141 50	118 101
f_S = 4 kHz Maximum current [A_{eff}] Rated current [A_{eff}]	6,6 1,4	6,4 4,0	10 2,1	9,6 5,7	18 4,9	15 11	29 5,8	21 14	35 8,9	28 18	51 10	39 23	86 22	64 47	141 42	106 87
f_S = 8 kHz (ab Werk) Maximum current [A_{eff}] Rated current [A_{eff}]	6,6 0,8	4,7 2,5	10 1,1	7,1 3,6	15 2,9	11 7,4	22 3,6	14 9,7	32 5,1	23 12	44 6,1	31 15	63 12	44 31	117 25	84 60
RPM adjustment range	1 : 4 000 000															
Current demand with 24 V module supply [A]	0,89		0,89		0,89		1,03		1,23		1,32		1,35		1,58	
Max. power dissipation at f_S = 4 kHz [W]	96,5		96,5		121		156		180		220		380		700	
Mass [kg]	6,0								7,3				11,5		19,3	
Module width [mm]	50												100		200	
Back wall modules	not required for DM..K															
Type	(RMA/DM8)[1]		(RMA/DM 30)[1]						RMA/ DM 30		RMA/ DM 45		RMB/ DM		RMD/ DM	
Number of fans	(–) [1]		(1)[1]						1		2		2		2	
in cold module technology	(RMA/DMC)[1]												RMB/DMC		RMD/DMC	
PM Personality Module	for DM modules with SERCOS interface															

f_S = cycle frequency [1] Specification for DM..A

DMA 140 D 1101 – D

3-phase module

Maximum current at f_S = 2 kHz
(refer to chart for specific data)

Module width: A = 50 mm
B = 100 mm
D = 200 mm
K = compact-format mechanical unit

1st digit: Interfaces
1 = SERCOS interface
2 = Customer interface
3 = Analogue with 12 bit resolution
4 = Analogue with 16 bit resolution
5 = 24 V control signals
7 = CAN bus
8 = 10 bit analogue, U/f performance curve

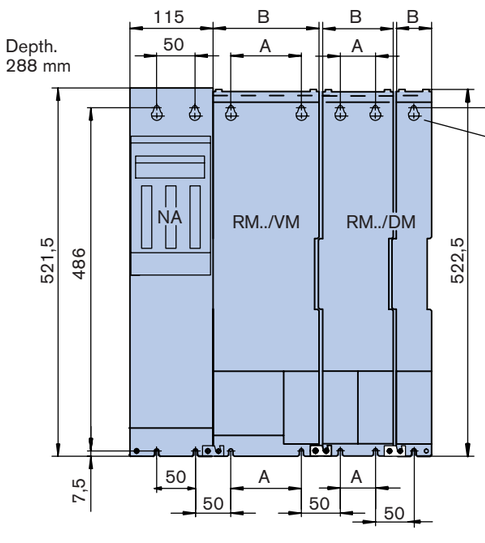
2nd digit: Sensor interface
0 = No sensor interface
1 = Absolute value sensor (STG. MTG)
2 = Toothed rotor sensor or STG or MTG
3 = Resolver

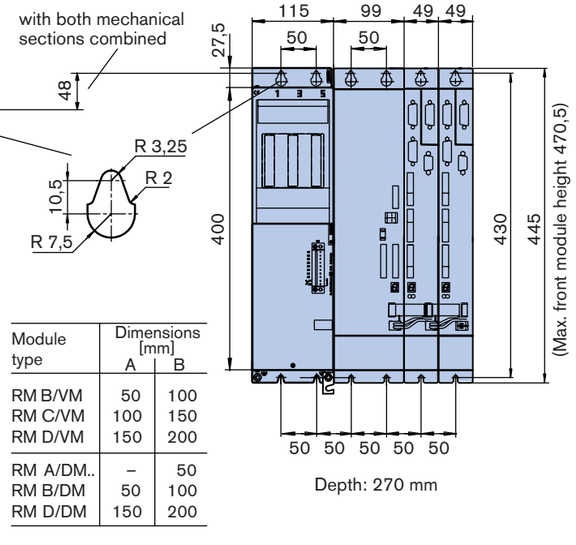
3rd digit: Auxiliary functions
0 = None
1 = Single-axis positioning

4th digit: Versions
1 = Standard

For direct-measurement systems rotative/linear	OM 01 – D	OM 02 – D	OM 03 – D
Input signals	Sine-wave current signals 7…16 µAp-p	Square-wave signals with RS 422 line driver	Sine-wave voltage signals 1Vp-p, EnDat interface
Measurement system voltage/current supply	5 V/max. 300 mA		
Max. input frequency	50 kHz	1 MHz	600 kHz
Pulse multiplication factor	20	4	4096
For rapid analogue outputs	OM 04 – D		
Output signals, programmable	4 analogue outputs with 12 bit resolution, voltage range ± 10 V, 100 W		

NA and back-mount modules for VM…B, C, D et DM…A, B, D





Module type	Dimensions [mm] A	B
RM B/VM	50	100
RM C/VM	100	150
RM D/VM	150	200
RM A/DM..	–	50
RM B/DM	50	100
RM D/DM	150	200

Bosch Servodyn D: Power modules

		VM..K with ballast switch		VM..B, C, D, with mains-friendly feedback		
Module type	Unit	VM..20K		VM..35B	VM..70C	VM..90D
Main voltage supply	V AC	3 x 380 … 415 ±10 %, 48 … 62 Hz				
Rated voltage	V AC	400, 50 Hz				
DC link voltage	V DC	670, regulated				
Rated current I_N (grid) at ϑ_U = 45 °C	A	23		34	66	80
Rated power P_N at ϑ_U = 45 °C	kW	16		24	47	57
Peak power	kW	20		34,6	70	97
Ballast resistance		intern	extern	–	–	–
Max. braking energy, single application	Ws	6500	59000	–	–	–
Max. continuous braking force	W	400	1000	–	–	–
Current draw from 24 V supply	A	24 V DC based on DIN 19 240				
		1,0		2,3	2,7	3,1
Max. power dissipation	W	220		460	800	970
Mass	kg	15,0		11,1	14,3	
Module width	mm	100			150	200
Back-mount types		not required		RMB/VM	RMC/VM	RMD/VM
with cold-module technology		–		RMB/VMC	RMC/VMC	RMD/VMC
PM Personality Module		not required		PM VM		
Power connection via		NV 20 mains filter		NA..35	NA..70	NA..90
Rated power at ϑ_U = 45 °C	kW	24		24	47	62
Mass	kg	10,6		8,4	8,4	8,4
Power choke NE		not required		NE 35	NE 70	NE 70/1	NE 90
Rated power at ϑ_U = 45 °C	kW	–		24	41,7	47	62
Inductance	mH	–		1,0	0,7	0,7	0,4
Max. power dissipation	W	–		150	200	210	350
Mass	kg	–		15	23	25	47

Explanation of type code

VMA 70 C R 001 – D

Power module

Max. rated current at ϑ_U = 45°C

Module width: B = 100 mm
C = 150 mm
D = 200 mm
K = compact-format mechanical unit

R = Sine-wave feedback
B = Internal ballast resistor
E = External ballast resistor

1. Interfaces: 0 = without digital interface
1 = SERCOS interface

2. Auxiliary functions: 0 = None

3. Versions: 1 = Standard
2 = Standard with RSU

Servodyn D model series

RM A / DM 30 – D

Back-mounted version

Module width: A = 50 mm
B = 100 mm
C = 200 mm

Version: VM = for VM
DM = for DM
□ = for all modules of module width
8 = for use with DM8
30 = for use with DM8...DM30
45 = for use with DM8...DM45
C = cold-module technology

NAA 70 / 1 – D

Grid activation module

For VM with same type size

1 = Standard
2 = with auxiliary filter

PM VMA / 0 00 – D

Personality module

VM = Power module
SM = Synchronous drive motors
FO = for regulated asynchronous drive motors
OS = without software

0 = Standard

Special customer-specific version

NVA 20 / 1 F – D

Grid wiring module

For VM with same type size

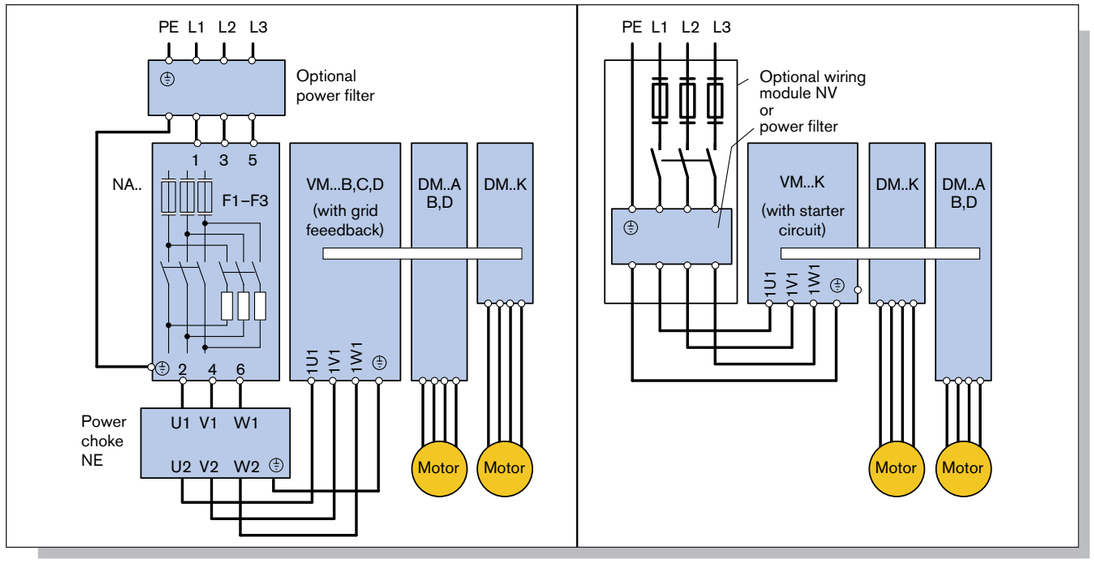
1st digit: 1 = for one VM
2nd digit: F = with grid filter

NE 70 / A 1 – D

Power choke

For VM with same type size

1st digit: A = standing, without cover
2nd digit: 1 = reinforced version



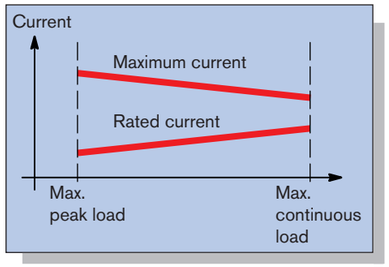
Bosch Servodyn D: Stand-alone converter

General specifications

Operating temperature	0 to + 45 °C 0 to + 55 °C wirh derating
Storage temperature	– 25 to + 70 °C
Protection rating	IP 20 as defined in EN 60 529
Climate class	3K3 as defined in EN 60721, no condensation
Installation height	≤ 1000 m above sea level; derating up to 3000 m above sea level

Module type	Unit	DS..15K	
Mains supply	V AC	3 x 400 … 460 ± 10 % 48 … 62 Hz	
Rated voltage	V AC	400, 50 Hz	
f_S = 2 kHz (ϑ_U = 45 °C) Maximum current Rated current	A_{eff} A_{eff}	max. peak load 17 7,2	max. cont. load 15 14
f_S = 4 kHz (ϑ_U = 45 °C) Maximum current Rated current	A_{eff} A_{eff}	max. peak load 17 6,0	max. cont. load 14 11
f_S = 8 kHz (ϑ_U = 45 °C) Maximum current Rated current	A_{eff} A_{eff}	max. peak load 15 4,4	max. cont. load 11 8,5
RPM adjustment range		1 : 4 000 000	
Rated power at ϑ_U = 45 °C	kW	3,5	
Peak power	kW	6,0	
Ballast resistor		internal	
Max. braking energy, single application	Ws	1000	
Max. Dauerbremsleistung	W	100	
Current draw from 24 V power supply	A	24 V DC based on DIN 19 240 max. 1.4 according to type	
Max. power dissipation at f_S = 4 kHz	W	120	
Mass	kg	5,9	
PM Personality Module		with SERCOS interface only	
Optional grid connection with		NV 20	
Rated power at ϑ_U = 45 °C	kW	24	
Mass	kg	10,6	

Maximum current band width



DS 15 K 1101 – D

3-phase current module

Maximum current at f_S = 2 kHz
(refer to chart for specific data)

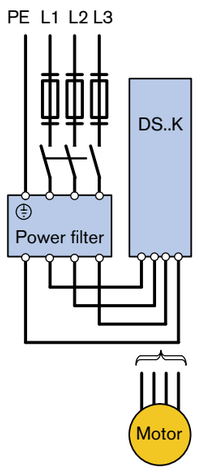
Module width: K = Compact mechanical unit

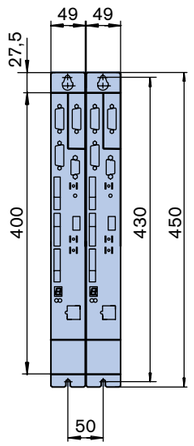
1st digit: Interfaces
1 = SERCOS interface
2 = Customer interface
3 = Analogue with 12 bit resolution
4 = Analogue with 16 bit resolution
5 = 24 V control signals
7 = CAN bus
8 = 10 bit analogue, U/f performance curve

2nd digit: Sensor interface
0 = No sensor interface
1 = Absolute value sensor (STG. MTG)
2 = Toothed rotor sensor or STG or MTG
3 = Resolver

3rd digit: Auxiliary functions
0 = None
1 = Single-axis positioning

4th digit: Versions
1 = Standard





Depth: 270 mm

Frequency converters

Modular or stand-alone layout

Servodyn D frequency converters rated at up to 4 kW are available in stand-alone housings. The modular units are suitable for combination with all supply and 3-phase modules in the Servodyn D range.

Rotation rate control up to 1 kHz

A programmable rotation rate/cycle frequency performance program makes it possible to run not only standard motors, but also high-frequency spindles at up to 60,000 rpm without sensor feedback.

Power range up to 45 kW

High-performance frequency converters with compact mechanicals and either folding and plug connectors are available for motors with outputs extending up to 45 kW.

□ = S1, 2 kHz cycle frequency
■ = S1, cycle frequency up to 4 kHz
■ = S1, cycle frequency up to 8 kHz

Motor			Frequency converter								
Power rating [kW]	Size	Current rating type [A]	DM.. 4K	DM.. 8K	DM.. 15K	DM.. 30K	DM.. 30A	DM.. 45A	DM.. 85B	DM.. 140D	DS.. 15K
0,25-0,37 0,55-0,75 1,1 1,5	71 80 90 90	1,1 2,0 2,8 3,7	■ ■ ■ ■	■ ■ ■ ■	 ■ ■						■ ■ ■ ■
2,2 3,0 4,0 5,5	100 100 112 132	5,2 7,0 9,0 12		■ □	■ ■ ■ □	■ ■ ■ ■	■ ■	■			■ ■ ■
7,5 11 15 18,5	132 160 160 180	16 22 30 37				□	■	■ ■	■ ■ ■		
22 30 37 45	180 200 225 225	44 59 73 88							■	■ ■ ■ □	

Prefabricated wiring harnesses

All wiring for connecting motors and sensor systems is suitable for drag chain conveyor systems.

Motor wiring
Prefabricated with plugs and/or wiring insulator caps, according to converter terminal configuration. Available with optional comprehensive shielding.

Sensor wiring:
Prefabricated with motor plug and D-sub plug for connecting converter. With comprehensive shielding.

Technical features

- Outer sleeve PUR 11Y (polyurethane) corresponding to DIN 0250, Section 818
- Colour blue, similar to RAL 5010, with embossed Bosch Order No.
- Bending radius at – 30 to + 60 °C
  with permanent fixed routing: 7 x external diameter
  flexible routing: 12 x external diameter

All wiring is suitable for drag chain operation at:

- acceleration ≦ 5 m/s²
- velocity ≦ 100 m/min

Bosch Servodyn D: Getting started, DSS-D Service System

The DSS Service System is a PC program with the following performance features:

- Drive system parameter definition
- Parameter archives
- Software download
- Operating data display
- Access to status and diagnosis information
- Command value generator
- Oscillographic display

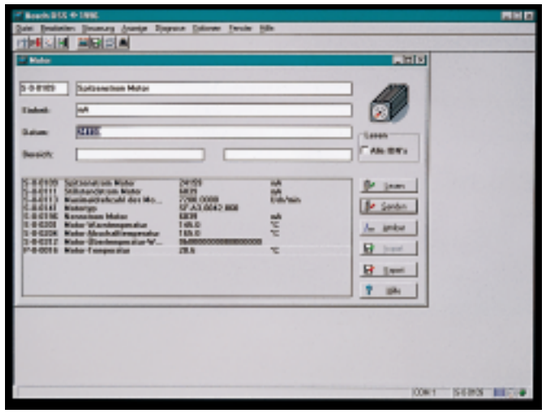


Abb. 1: Motor parameters

Abb. 2: Oscilloscope

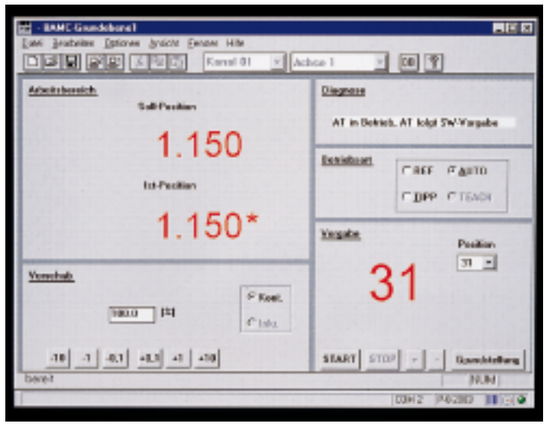


Abb. 3: Motion Control User interface

Requirements:

- IBM compatible PC
- Operating system Windows Version 3.1 / 3.11 / 95 or higher
- 4 MB working memory
- 15 MB free hard disk capacity
- Unused COM interface

The system furnishes access to the following individual functions:

- BUS master parameters
- Parameters for BUS initialization
- Parameters for optimizing controller performance
- Motor parameters, refer to Fig. 1
- Sensor parameters
- Operating data
- Oscilloscope function, refer to Fig. 2
- Display of static and dynamic module status
- Parameters for motion-control functions, refer to Fig. 3

RSU Redundant Security Monitoring

Servodyn D allows you to install machine protection equipment of the kind defined in

EN 954-1	Category III together with
EN 12415	(security, rotating machinery)
EN 12417	(security in operations centres)
EN 60204-1	(machine equipment and security requirements)

with no supplementary modifications.

Requirements:

- VM..B,C,D power module with inverse grid voltage and RSU
- NA grid activation module
- DM..K, A, B, D 3-phase power module with SERCOS interface