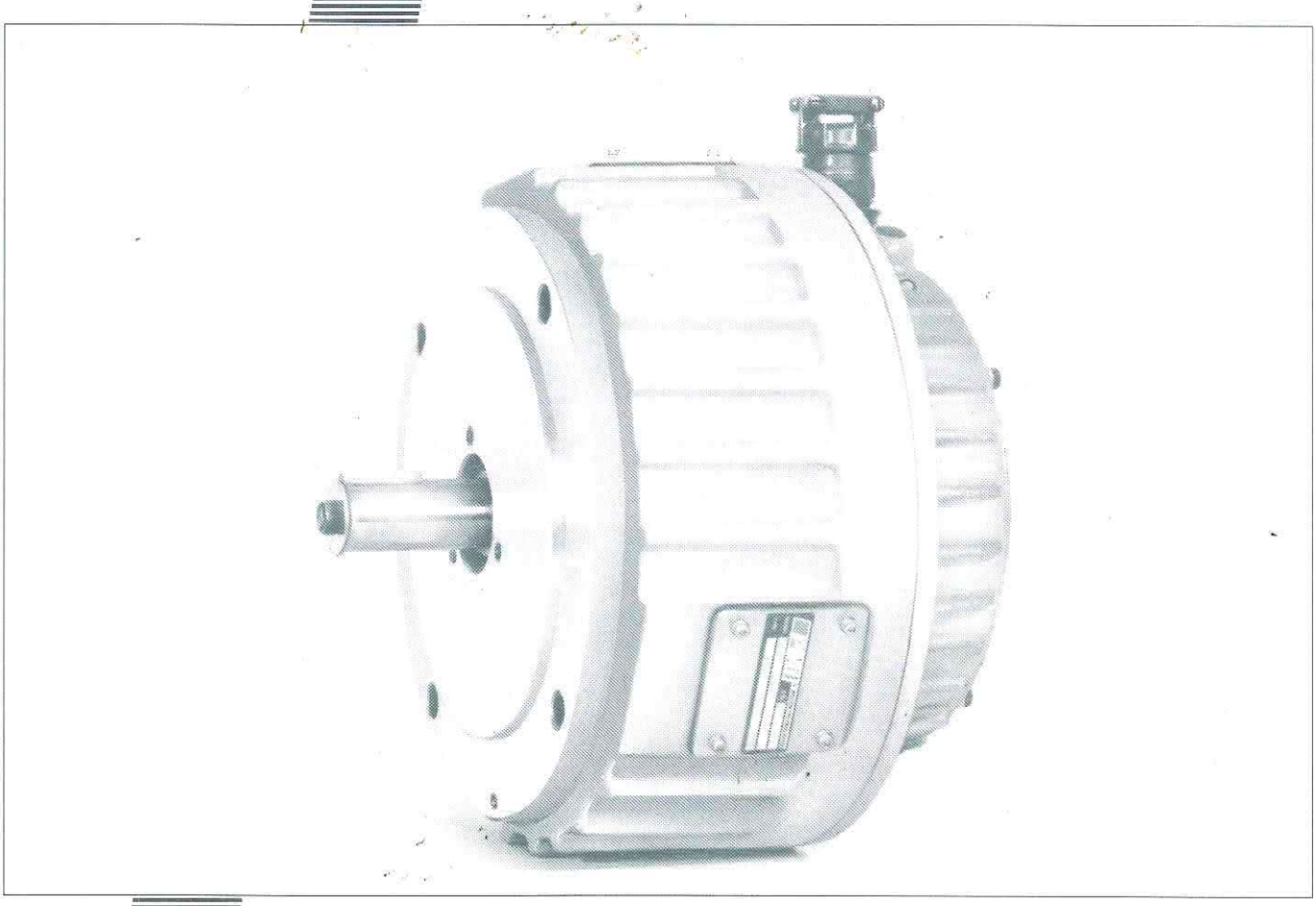
DC Servo Motors
ServoDisc™

JR ... Series



- *Rugged housing protects against harsh environments*
- *Compact axial lengths*
- *Highest torque / weight ratio possible in a high performance dc servo motor*
- *Mechanical time constants of 5 ... 10 ms*
- *Zero cogging for smooth operation*
- *Available with tacho, optical encoder, failsafe brake and precision gearhead.*

PMI
MOTION TECHNOLOGIES

Characteristics

JR ... Series

Specifications			JR12M4CH	JR16M4CH	JR24M4CH	JR25M8CH
1. Rated Values (1)						
1.1 Nominal torque	M_N	Ncm	124	310	958	1353
1.2 Nominal speed (2)	n_N	min^{-1}	3000	3000	3000	3000
1.3 Power output (2)	P_N	W	390	970	3000	4250
1.4 Terminal voltage	U_N	V	63	130	140	155
1.5 Nominal current	I_N	A	7,7	9,0	25	31
2. Motor Performance						
2.1 Peak torque (3)	M_{max}	Ncm	1358	3747	9700	13400
2.2 Max. peak current (3)	I_{max}	A	80	100	238	290
2.3 Acceleration at peak torque	a_{max}	$10^3 rad/s^2$	113	63	30	27
2.4 Stall torque (4)	M_O	Ncm	115	327	816	1099
2.5 Current at stall torque (4)	I_O	A	6,8	8,8	20	24
2.6 Max. load speed	n_{max}	min^{-1}	4000	4000	4000	4000
2.7 Max. no load speed	n_O	min^{-1}	6000	6000	5000	5000
3. Intrinsic Motor Constants						
3.1 Torque constant	k_T	Ncm/A	17,0	37,2	41,1	45,8
3.2 Back E.M.F. constant	k_E	$V/10^3 min^{-1}$	17,8	39,0	43,5	48,0
3.3 Viscous damping constant	k_D	$Ncm/10^3 min^{-1}$	1,96	6,4	12,0	12,8
3.4 Speed regulation at const. voltage	k_n	min^{-1}/Ncm	3,1	0,65	0,18	0,1
3.5 Average friction torque	M_F	Ncm	4,2	7,0	14,2	17,6
3.6 Terminal resistance (25° C)	R_A	Ohm	0,95	0,94	0,31	0,22
3.7 Armature (Cu) resistance (25° C)	R_{Cu}	Ohm	0,73	0,74	0,23	0,15
3.8 Armature inductance	L_A	mH	< 0,1	< 0,1	< 0,1	< 0,1
3.9 Mechanical time constant	T_m	ms	3,9	4,0	5,9	5,3
3.10 Electrical time constant	T_e	ms	0,1	0,1	0,3	0,5
3.11 Rotor inertia	J	$kg\,cm^2$	1,2	5,9	32,5	49,4
4. Thermal Characteristics						
4.1 Time const. armature-housing	T_{th1}	min	0,8	1,7	1,6	2,1
4.2 Time const. housing-ambient (5)	T_{th2}	min	27	35	90	70
4.3 Resistance armature-housing	R_{th1}	K/W	1,0	0,7	0,4	0,3
4.4 Resistance housing-ambient (5)	R_{th2}	K/W	0,7	0,6	0,3	0,25
4.5 Temperatur coeff. of back E.M.F.	c_{th}	%/K	− 0,02	− 0,02	− 0,02	− 0,02
4.6 Max. cont. armature temperatur	th	°C	155	155	155	155
5. Physical Data						
5.1 Number of magnet poles	2p	pcs	8	8	8	8
5.2 Number of commutator bars	z	pcs	141	165	193	193
5.3 Admitted shaft load,) radial	F_R	N	220	440	750	750
5.4 Admitted shaft load,) axial	F_A	N	220	420	600	600
5.5 Weight (mass), without extensions	m	kg	3,6	7,9	23	32
5.6 Weight (mass), with tachogenerator	m	kg	4,4	8,9	24	33

1) for D.C. current with formfactor 1,05, uncooled execution, protection IP 54, ambient temperatur +40 degr. C
2) Continuous operation S1, VDE 530, part 1,4. Motor can be run at all points of the torque speed curve S1, continuous speed beyond 4000 rpm is not recommended, please check the torque speed curve.
3) Incremental motion cycle S3, VDE 530, part 1,4. pulse duration 50 ms, 1% of duty cycle.
4) Point of intersection torque speed curve S1 with torque coordinate at speed zero. Permitted at very low speed < 1 rpm. Works the motor with blocked shaft longer than 20 s, the stall current must be reduced to appr. 70%
5) Based upon mounted motors, heat transfer from motor to equipment.

Options

JR ... Series

Analog tachometer		F9T	F12T	G9T	W6T
EMF / 1000 rpm (± 5%)	V/10³ rpm	3	6	10	19
Bi-directional tolerance	%	± 1,5	± 1,5	± 1	± 1
Residual ripple peak to peak (1)	%	< 4	< 3	< 2,5	< 3
Linearity ref. to 3600 rpm	%	0,05	0,05	0,15	0,15
Temperature coefficient of EMF	%/K	– 0,02	– 0,02	– 0,02	– 0,04
Max. rated current (2)	mA	100	100	60	30
Max. speed (3)	rpm	4000	4000	8000	4000
Output impedance	Ω	1	1	65	26
Inductance	mH	0,1	0,1	10	10
Rotor inertia	kg cm²	0,04	1,5	1,2	0,7
Weight (coupling and cover incl.)	kg	1,6	1,5	1,6	1,7

1) resistive load 10 kOhm 2) Thermally allowable 3) mechanically allowable

Incremental shaft encoder, BI 25M ... series		square wave				sine wave	
		standard	open collector		line driver	bi-polar	
Number of outputs	pcs	channel A, B, Index (+ complementary)					
Cycles per revolution	pcs	50	250	500	1024	50	250
		60	254	512	1200	60	300
		100[1]	300	600	1500	100	360
		180	**360**[1]	800	**2000**[1]	180	400
		200	400	**1000**[1]	2048	200	500
Phasing	degree el.	90°		90°	90°	90°	
Phasing tolerance	degree el.	± 30°		± 30°	± 30°	± 30°	
Supply voltage (± 5%)	V_{DC}	5, 12 or 15		5	5, 12 or 15	± 15	
Max. rated current	mA	100		100	350	20	
Frequency response	kHz	100		100	100	50	
Inertia	kg cm²	0,021		0,021	0,021	0,021	
Operating temperature	°C	0 – 70		0 – 70	0 – 70	0 – 70	
Weight (cover incl.)	kg	0,4		0,4	0,4	0,4	

[1] Standard, available on stock

Failsafe brake, BRK series (holds the motor shaft on loss of current)		built-in brake for motor			
		JR 12...	JR 16...	JR 24...	JR 25...
Braking torque (40° C)	Ncm	200	450	1000	1800
Supply voltage (± 5%)	V_{DC}	24	24	24	24
Current	A	0,5	0,6	0,8	1,0
Switch on time	ms	7	15	30	55
Switch off time	ms	5	7	13	18
Rotor inertia	kg cm²	0,38	1,06	3,60	9,50
Weight (cover incl.)	kg	0,6	1,0	1,7	2,6

How to order

JR..... / BRK / .... / BI 25 M

- Encoder[1]
- Tach
- Brake
- Motor

(1) Additionel details about encoders

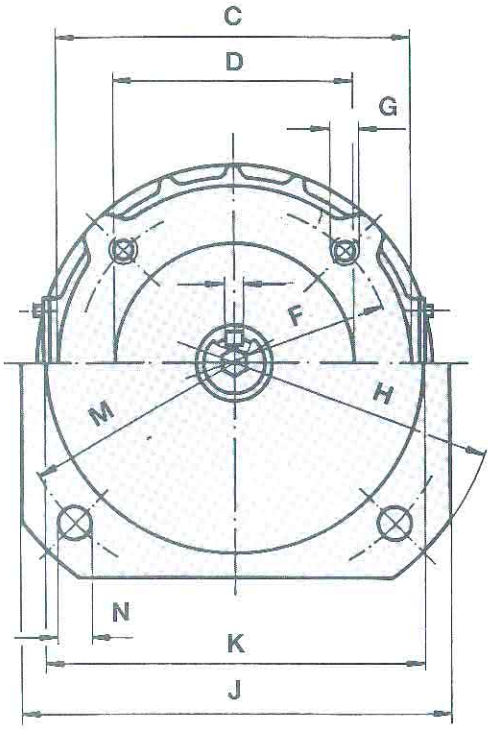
BI 25 M–.... –... –.. –..

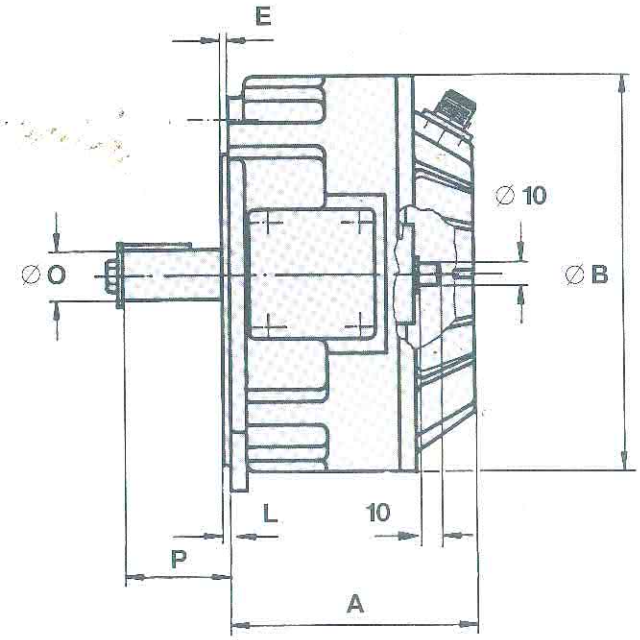
- Output signal
  - S = Standard
  - SC = Standard, complementary
  - D = Line Driver
  - O = Open collector
  - S = Sine wave
- Voltage
  - 5 = 5 Volt
  - 12 = 12 Volt
  - 15 = 15 Volt (± 15 V sine wave)
- Outputs
  - AB = Channel A + B
  - ABI = Channel A, B + Index
- Cycles per revolution
  - 0050 = 50 cycles
  - 0360 = 360 cycles
  - 2048 = 2048 cycles

Motor order number (example)

Motor **JR12M4CH**
Motor with tach **JR16M4CH/G9T**
Motor with brake and tach **JR24M4CH/BRK/W6T19**
Motor with tach and encoder ..... **JR25M8CH/F12T/BI25M (BI25M–0360–ABI–15–DC)**

Outline drawings
JR ... Series





Dimensions	A		B	C	D	E	F	G	H	J	K	L	M	N	O	P
Motor	no tach	with tach		round flange (B 14)					square flange (B 5)							
JR12M4CH	109	156	140	121	95^{j6}	3,0	115	M6	200	172	130^{j6}	3,0	165	12	14^{g6}	30
JR16M4CH	115	162	187	167	130^{j6}	3,5	165	M8	250	202	180^{j6}	4,0	215	15	24^{g6}	50
JR24M4CH	185	218	282	242	180^{j6}	5,0	215	M12	350	275	250^{j6}	4,0	300	18	28^{g6}	60
JR25M8CH	197	259	282	242	180^{j6}	4,0	215	M12	350	275	250^{j6}	4,0	300	18	28^{g6}	60

Built-in brake and encoder on request.

Information mentioned in this leaflet is given only for indication and may be amended without notice.

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