

Digiplan PDX15
Single-Axis Ministep Drive



\$2150.00

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PDX Series

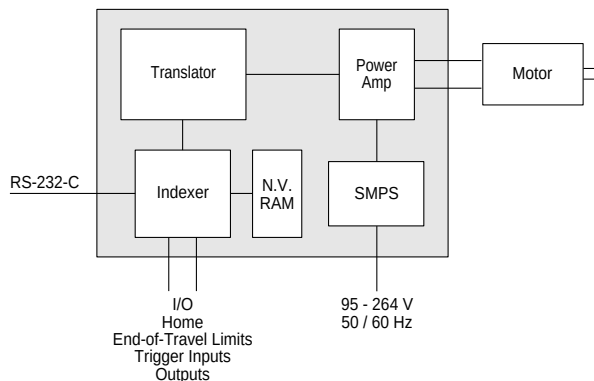
Packaged Drive Indexer

The PDX drives are ideal for single-axis applications or multi-axis applications that do not require complex coordinated motion control. The integral indexer reduces panel real estate, external cabling and installation problems. Typically referred to as an "Intelligent Drive" the PDX can be programmed with complete motion programs, which interact with the drive's I/O to synchronize motion to other external events.

Features

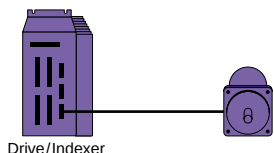
- Integral indexer reduces wiring and installation costs
- Indexer provides homing, end-of-travel limit and trigger input functions
- IBM PC™ Compatible Application Development Software
- Nonvolatile memory stores complete application programs
- RS232C Serial Communications for download of motion programs
- Serial Communications Data Streaming for interactive motion programs
- Daisy-chaining allows up to 255 drives to be commanded from single host computer
- Encoder input for optional closed loop operation

Diagram



PDX Specifications

Parameter	Value
AC Power Input	
Connector	IEC 3-way, mating cable supplied
Supply voltage	95VAC - 264VAC (absolute limits)
Supply frequency	47 to 63Hz
Power factor	Better than 0.9 over full input voltage and output power range
Performance	
Speed range	0.01-50 rps
Acceleration range	0.01-999 rps ²
Position range	±1-99,999,999 steps
Resolution	Switch selectable; 400, 1,000, 2,000 and 4,000 steps/rev
Speed/Torque	Curves located on page C49; CE motors located on page C52
RS232C Communications	
Type	RS232C serial link, 3-wire implementation (TX, RX, GND)
Parameter	9600 baud, 8 data bits, 1 stop bit, no parity
Configuration	PDX drives may be daisy-chained from a single RS232C port Up to 8 PDX drives if using hardware address selection inputs Up to 255 PDX drives if using software address selection
Protection	
Short-circuit	Drive shuts down and signals a fault in any of the conditions listed
Brownout	Across and between phase and phase to GND
Overvoltage	If DC Bus <50VDC
Internal supplies	If DC Bus >90VDC
Overtemperature	Any internal supply out of specification If internal temperature >90°C (194°F)
Indexer Hardware	
Inputs	3 trigger inputs, TTL levels 3 sequence select inputs, TTL levels 3 address select inputs, TTL levels Home and end-of-travel limits, TTL levels
Outputs	2 programmable, TTL levels Dedicated Fault, Step, Direction and Shutdown, TTL levels
Encoder	Single-ended TTL inputs for A, B and Z channels
Indexer Software	
Motion programming	Preset absolution or incremental indexes Comprehensive homing functions Stall detection and position maintenance from encoder input
Memory storage	Battery-backed memory to store programs 7 sequences of 256 characters per sequence
Program selection	RS232C command XR Sequence selection inputs Auto-run on power-up
Physical	
Drive dimensions	Height 9.8" (250 mm), width 2" (50 mm), depth 7.5" (190 mm); drawings located on page C55
Weight (drive only)	Net 4 lbs (1.8 Kg)
Environmental	
Operating temperature	0°C to 40°C (32°F to 104°F)
Storage temperature	-40°C to 85°C (40°F to 185°F)
Relative Humidity	0% to 95% (non-condensing)
Ingress protection	IP20
Mounting	Panel mount. Vertical mounting only Mounting slots for #8 (M4) Allen Cap or Fillister/Pan Head screws
Diagnostics	
	Power LED (green); Fault LED (red)



Command Listing

A	Acceleration	PS	Pause
B	Buffer Status	PX	Report Absolute Encoder Position
BS	Buffer Size Status	PZ	Set absolute counter to zero
C	Continue	"	Quote
CG	Correction Gain	Q	Velocity Profiling Mode
CR	Carriage Return	R	Request Indexer Status
D	Distance	RA	Request Status of End-of-Travel Limits
DB	Dead Band	RB	Status of Loop, Pause, Shutdown and Trigger Input
DW	Dead Band Window	RC	Closed Loop Status
E	Enable Communications	RM	Rate Multiplier
ER	Encoder Resolution	RV	Revision Level
F	Disable Communications	S	Stop
FS	Encoder Functions Report	SN	Scan Debounce Time
FSA	Set Indexer to Inc/Abs Mode	SS	Software Switch Function Setup
FSB	Set Indexer to Motor/Encoder Step Mode	SSA	RS232C Echo Control
FSC	Enable/Disable Position Maintenance	SSG	Clear/Save Command Buffer on Limit
FSD	Stop on Stall	SSH	Clear/Save Command Buffer on Stop
FSE	Turn on Output 1 on Stall	ST	Shutdown
FSF	Stop Motion on Trigger 3	SV	Servoing Parameter
FSG	Turn on Output 2 when in Dead-Band	T	Time Delay
FSH	Enable Stall Detection	TR	Wait for Trigger
G	Go	TS	Trigger Input Status
GH	Go Home	U	Pause and Wait For Continue
^H	Delete	V	Velocity
H	Set Direction	W1	Signed Binary Position Report
IS	Input Status	W3	Hexadecimal Position Report
K	Kill	XC	Sequence Checksum
L	Loop	XD	Sequence Define
LD	Limit Deceleration	XE	Sequence Erase
LF	Line Feed	XP	Power-Up Sequence Mode
MC	Mode Continuous	XQ	Sequence Interrupted Run Mode
MN	Mode Normal	XR	Run a Sequence
MPA	Mode Position Absolute	XRP	Run a Sequence with Pause
MPI	Mode Position Incremental	XSD	Sequence Status Definition
MRD	Motor Resolution Define	XSP	Sequence Status Power-Up
N	End of Loop	XSR	Sequence Status Run
O	Output	XSS	Sequence Status
OS	Report Homing Function Setup	XT	Sequence Termination
OSA	Define Active State of end-of-travel Limits	XU	Upload Sequence
OSB	Back-Up to Home	Y	Stop Loop
OSC	Define Active State of Home Switch	Z	Reset
OSD	Home to Z-Channel	#	Remote Address
OSH	Reference Home Switch Edge		
PR	Absolute Position Report		

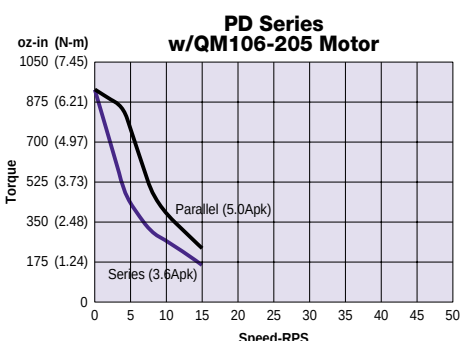
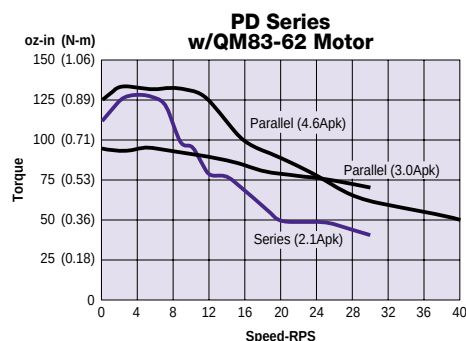
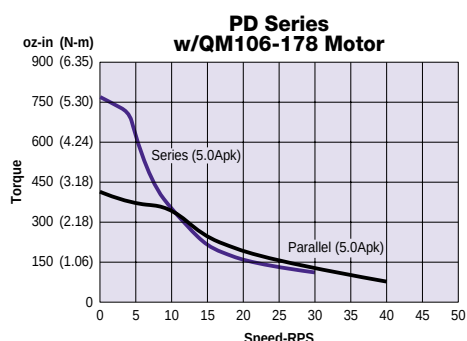
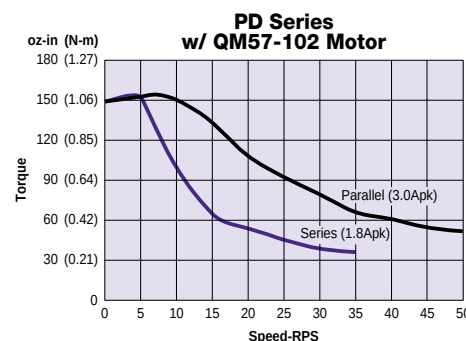
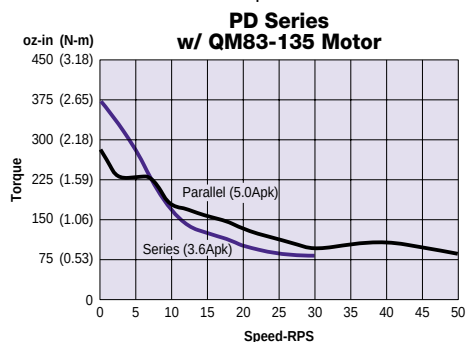
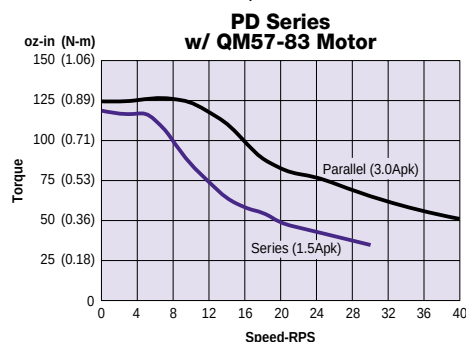
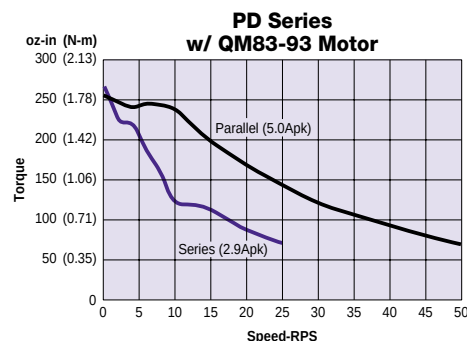
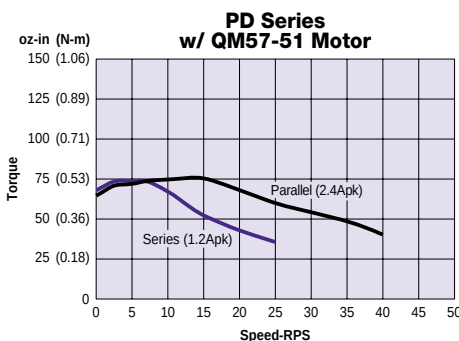
Non-CE Motor Speed/Torque Curves

Power Dump Option

Applications involving rapid deceleration of high-inertia loads may require the addition of a circuit to dissipate the regenerated power. The need for a power dump will depend on the system inertia, the maximum speed and the deceleration time.

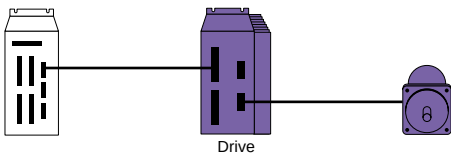
The -D version of the PD Series incorporates a power dump with a continuous rating of 15 watts (170 watts peak). This version is needed if the deceleration time in seconds from a maximum speed w is less than $(Jw^2 - 0.1)$, where J is the total system inertia in Kg-m^2 (including the motor) and w is the maximum speed in revs/sec. If the expression in brackets is negative, no power dump is required. The dump option is strongly recommended with size 42 (metric 106) motors.

Note: $\pm 10\%$ torque variance due to motor tolerance.



Drive's Peak Current Levels

PDS/X13	0.9–3.0 Apk
PDS/X15	2.5–5.0 Apk



QM Motor Data (Non-CE)

		Size 23			Size 34			Size 42	
		QM-57-51	QM-57-83	QM-57-102	QM-83-62	QM-83-93	QM-83-135	QM-106-178	QM-106-205
Rotor inertia									
oz-in ²		0.546	1.10	1.69	3.47	6.76	10.47	44.0	52.0
(kg-cm ²)		(0.100)	(0.201)	(0.309)	(0.635)	(1.24)	(1.92)	(8.05)	(9.51)
Bearings									
Thrust load	lb	25	25	25	50	50	50	50	50
	(kg)	(11.3)	(11.3)	(11.3)	(22.6)	(22.6)	(22.6)	(22.6)	(22.6)
Radial load	lb	15	15	15	25	25	25	25	25
	(kg)	(6.8)	(6.8)	(6.8)	(11.3)	(11.3)	(11.3)	(11.3)	(11.3)
End play	in	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.005
Reversing load	(mm)	(0.13)	(0.13)	(0.13)	(0.13)	(0.13)	(0.13)	(0.13)	(0.13)
Equal to 1 lb									
Radial play	in	0.0008	0.0008	0.0008	0.0008	0.0008	0.0008	0.0008	0.0008
Per 0.5 lb load	(mm)	(0.02)	(0.02)	(0.02)	(0.02)	(0.02)	(0.02)	(0.02)	(0.02)
Weight (net)									
Motor+Cable									
+Connector	lb	1.6	2.4	3.2	3.8	5.1	8.3	19.1	23.4
	(kg)	(0.7)	(1.1)	(1.5)	(1.7)	(2.3)	(3.8)	(8.7)	(10.7)

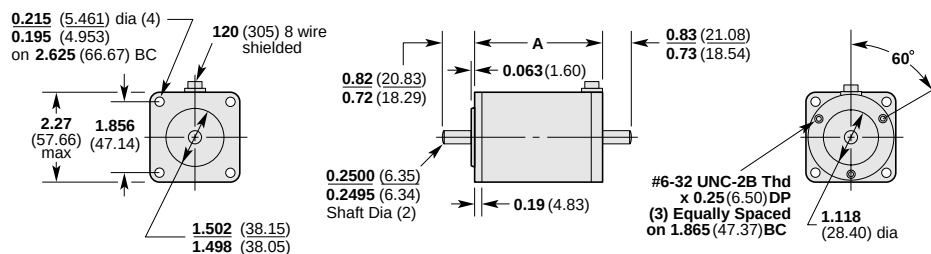
All motors: Cable length = 10 ft (3 m) with pigtails.

Non-CE Motor Dimensions

(—) denotes millimeters

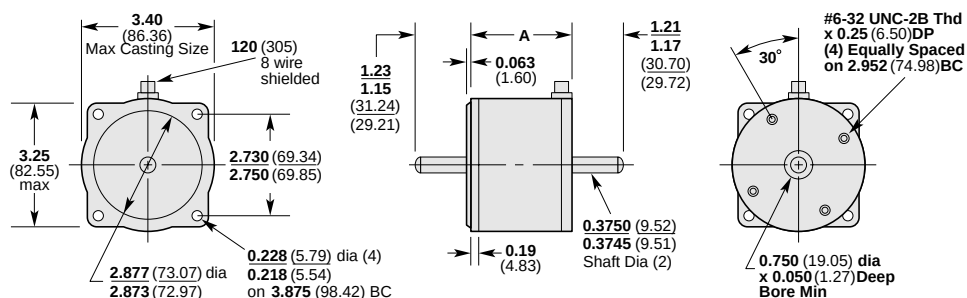
Size 23 frame

Model	A
QM-57-51	2.0 (50.23)
QM-57-83	3.1 (75.23)
QM-57-102	4.0 (101.6)



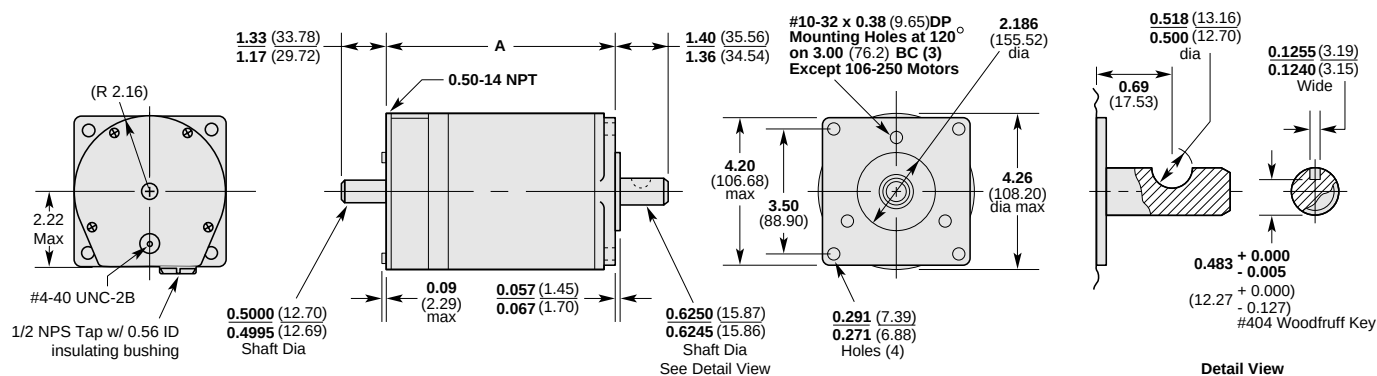
Size 34 frame

Model	A
QM-83-62	2.5 (62.0)
QM-83-62	2.5 (62.0)
QM-83-93	3.7 (93.98)
QM-83-135	5.2 (129.0)

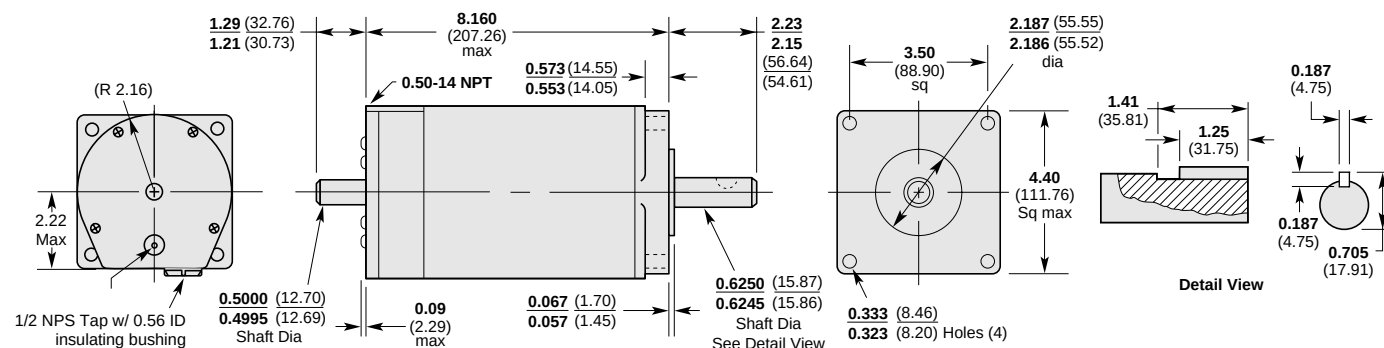


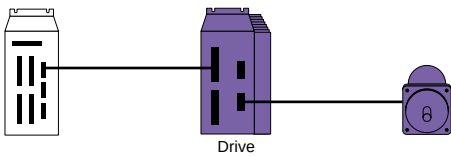
Size 42 frame

Model	A
QM-106-178	7.56 (192.02) single endshaft
QM-106-178	7.69 (195.32) Double endshaft



Model QM-106-205, QM-106-205





CE Motor Speed/Torque Curves

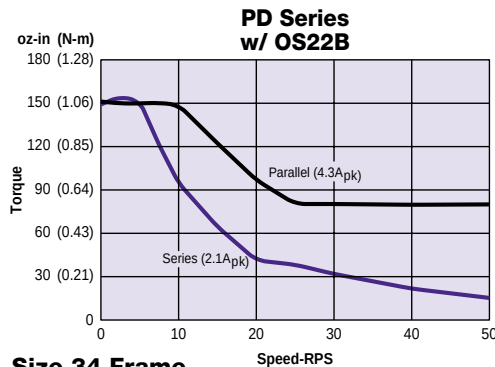
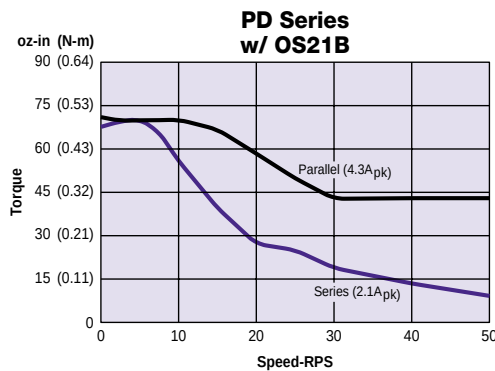
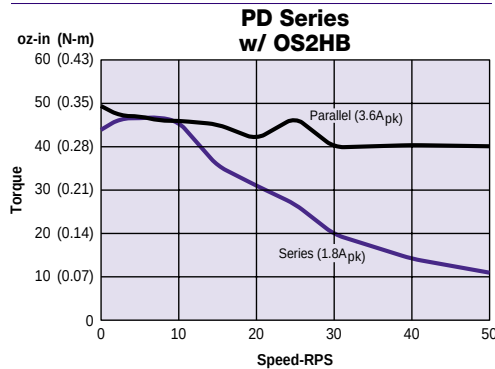
Power Dump Option

Applications involving rapid deceleration of high-inertia loads may require the addition of a circuit to dissipate the regenerated power. The need for a power dump will depend on the system inertia, the maximum speed and the deceleration time.

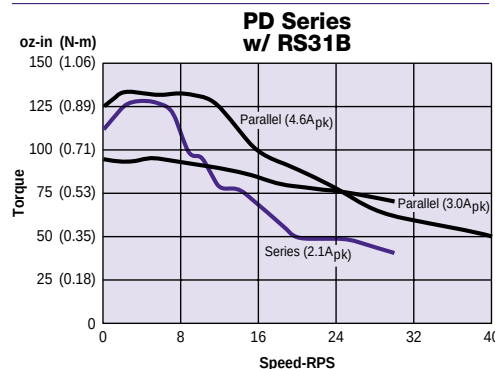
The -D version of the PD Series incorporates a power dump with a continuous rating of 15 watts (170 watts peak). This version is needed if the deceleration time in seconds from a maximum speed w is less than $(Jw^2 - 0.1)$, where J is the total system inertia in Kg-m^2 (including the motor) and w is the maximum speed in revs/sec. If the expression in brackets is negative, no power dump is required. The dump option is strongly recommended with size 42 (metric 106) motors.

Note: $\pm 10\%$ torque variance due to motor tolerance.

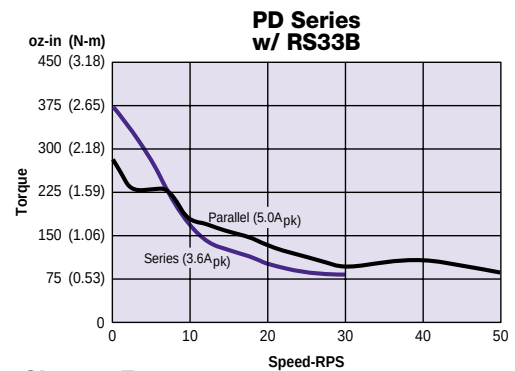
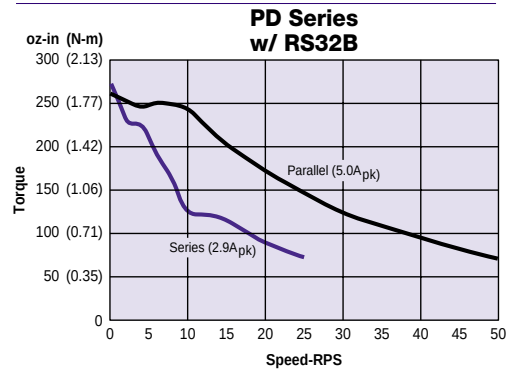
Size 23 Frame



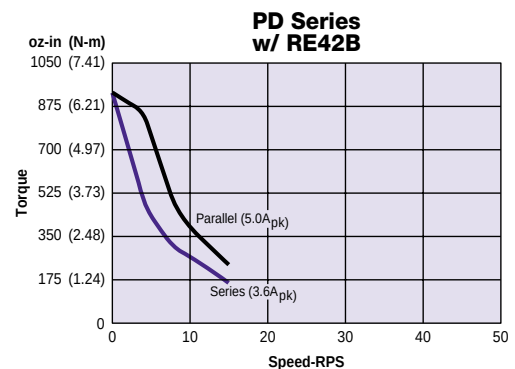
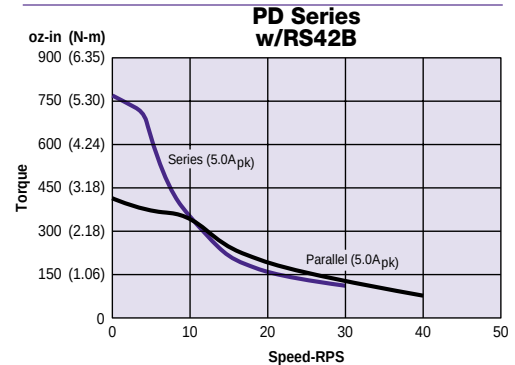
Size 34 Frame



Size 34 Frame



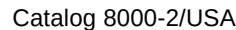
Size 42 Frame



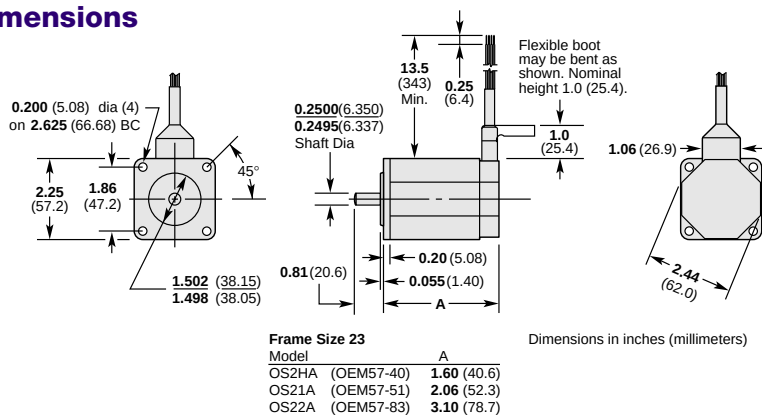
Drive's Peak Current Levels

PDS/X13	0.9–3.0 Apk
PDS/X15	2.5–5.0 Apk

CE Motor Data	Size 23 Frame			Size 34 Frame			Size 42 Frame	
	OS2HB	OS21B	OS22B	RS31B	RS32B	RS33B	RS42B	RE42B
Static torque								
oz-in (Nm)	43 (0.30)	82 (0.58)	155 (1.09)	135 (0.95)	270 (1.91)	375 (2.65)	750 (5.30)	900 (6.35)
Rotor inertia								
oz-in ² (kg-cm ²)	0.386 (0.070)	0.656 (0.119)	1.390 (0.253)	3.204 (0.583)	6.563 (1.195)	9.652 (1.757)	61.76 (11.30)	61.76 (11.30)
Drive Current (Apk)(Arms)								
Series	1.8 (1.3)	2.1 (1.5)	2.1 (1.5)	2.1 (1.5)	2.9 (2.1)	3.6 (2.5)	5.0 (3.5)	3.6 (2.5)
Parallel	3.6 (2.5)	4.3 (3.0)	4.3 (3.0)	4.6 (3.3)	5.0 (3.5)	5.0 (3.5)	5.0 (3.5)	5.0 (3.5)
Phase Inductance (mH)								
Series	8.6	12	16.6	7.5	11.6	23.3	8.5	42.6
Parallel	2.2	3	4.2	1.9	2.9	5.8	2.1	10.6
Detent Torque								
oz-in (Nm)	2.5 (0.018)	4.0 (0.028)	7.0 (0.049)	8.8 (0.062)	18.0 (0.130)	27.0 (0.190)	41.7 (0.294)	81.0 (0.570)
Bearings Information								
Thrust Load								
lb (kg)	13 (5.9)	13 (5.9)	13 (5.9)	180 (81.6)	180 (1.6)	180 (81.6)	400 (182)	400 (182)
Radial Load								
lb (kg)	20 (9.1)	20 (9.1)	20 (9.1)	35 (5.9)	35 (5.9)	35 (15.9)	140 (63.6)	140 (63.6)
End Play (Reversing load equal to 1 lb)								
in (mm)	0.001 (0.025)	0.001 (0.025)	0.001 (0.025)	0.001 (0.025)	0.001 (0.025)	0.001 (0.025)	0.001 (0.025)	0.001 (0.025)
Radial Play (Per 0.5 lb load)								
in (mm)	0.0008 (0.02)	0.0008 (0.02)	0.0008 (0.02)	0.0008 (0.02)	0.0008 (0.02)	0.0008 (0.02)	0.0008 (0.02)	0.0008 (0.02)
Motor Weight								
lb (kg)	1 (0.45)	1.5 (0.68)	2.5 (1.14)	3.2 (1.45)	5.3 (2.41)	7.6 (3.45)	18.2 (8.26)	18.2 (8.26)
Certifications								
UL recognized	Pending	Pending	Pending	Yes	Yes	Yes	Yes	Yes
CE (LVD)	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
CE (EMC& LVD)	No	No	No	w/ C10	w/ C10	w/ C10	w/ C10	w/ C10



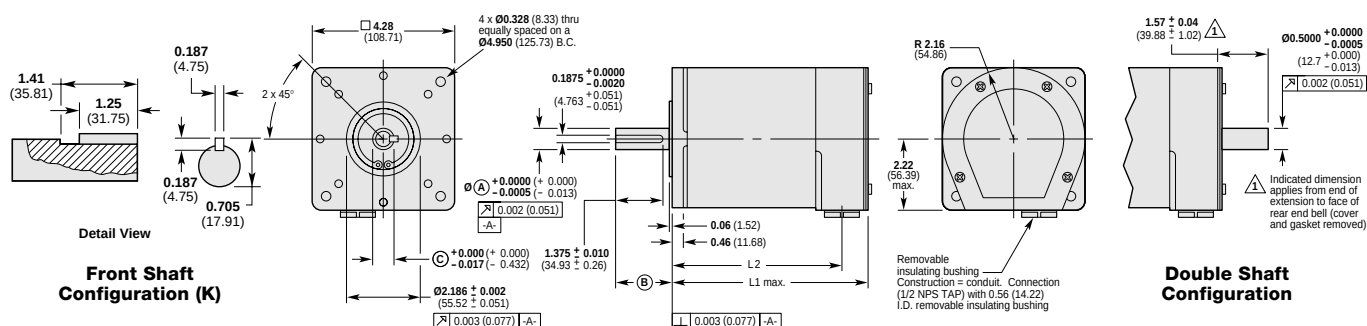
(—) denotes millimeters



Model	Lmax	L2
RS31B-□□NPS	3.62 (91.95)	2.87 (72.9)
RS32B-□□NPS	4.77 (121.16)	4.02 (102.11)
RS33B-□□NPS	6.05 (153.67)	5.30 (134.62)

Model	Lmax	
RS31B-□□R10	2.58	(65.54)
RS32B-□□R10	3.76	(95.51)
RS33B-□□R10	5.06	(128.53)

Model	Lmax	L2	A	B	C
RS42B-□□NPS	8.04 (204.22)	7.29 (185.17)	0.625 (15.87)	2.19 (55.63)	0.705 (17.91)
RE42B-□□NPS	8.04 (204.22)	7.29 (185.17)	0.625 (15.87)	2.19 (55.63)	0.705 (17.91)

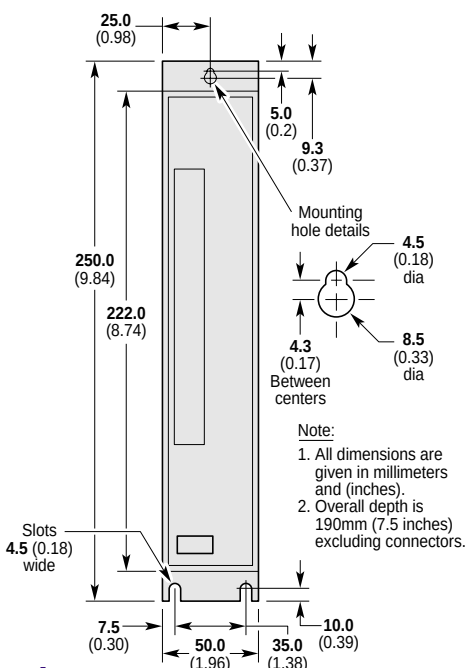


Drive Dimensions

(PDS and PDX drives have same dimensions.)

Drive comes complete with hood for 25-pin D-type connector. Depth with hood = 9.8" (250mm).

Drive mounting holes and slots are suitable for #8 or M4 screws.

**I/O Connections and Switch Functions**
PDS/PDX Drives
Motor Connector
 5-Pin Screw
Pin No. Signal

1	A +
2	A -
3	GND
4	B +
5	B -

PDS/PDX Drives
AC Power
 IEC Plug
Pin No. Signal

1	Hot (Line)
2	GND
3	Neutral

PDS Drive
Switch Functions
Pin No. Signal

1	Self-Test
2	Standby Mode
3	Oscillator Int/Ext Potentiometers
4	Step Resolution
5	Step Resolution
6	Motor Current
7	Motor Current
8	Motor Current

PDS Drive
Control I/O Connector
 25-Pin D-Type Socket
Pin No. Signal

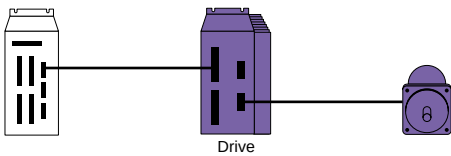
1	Step +
2	Direction +
3	Reserved—Do Not Connect
4	Reserved—Do Not Connect
5	Reserved—Do Not Connect
6	External Slow Potentiometer
7	External Fast Potentiometer
8	Reserved—Do Not Connect
9	Fault +
10	Reserved—Do Not Connect
11	Reserved—Do Not Connect
12	Slow Run
13	Fast Run
14	Step -
15	Direction -
16	Shutdown +
17	Shutdown -
18	Reserved—Do Not Connect
19	External Potentiometer Common
20	Internal Clock Out
21	Fault -
22	Reserved—Do Not Connect
23	Aux Clock
24	Aux Dir
25	GND

PDX Drives
Control I/O Connector
 25-Pin D-Type Socket
Pin No. Signal

1	Step Output
2	Direction Output
3	CW Limit
4	CCW Limit
5	Home Input
6	Reserved—Do Not Connect
7	GND
8	Output 2
9	Fault Output
10	Output 1
11	Sequence Select Input 1
12	Sequence Select Input 2
13	Sequence Select Input 3
14	TX-RS232C
15	RX-RS232C
16	Shutdown Output
17	Encoder Channel A
18	Encoder Channel B
19	Encoder Channel Z
20	Trigger Input 1
21	Trigger Input 2
22	Trigger Input 3

PDX Drives
Switch Functions
Pin No. Signal

1	Self-Test
2	Standby Mode
3	No Function
4	Step Resolution
5	Step Resolution
6	Motor Current
7	Motor Current
8	Motor Current



Ordering Information

Drives

Part No.	Description	CE (LVD)
PDS13	Packaged 3Apk, 70VDC bus ministepping drive	
PDS15	Packaged 5Apk, 70VDC bus ministepping drive	
PDS15-D	Packaged 5Apk, 70VDC bus ministepping drive and power dump	

Indexers/Drive

Part No.	Description	CE (LVD)
PDX13	Packaged 3Apk, 70VDC bus ministepping indexer/drive	
PDX15	Packaged 5Apk, 70VDC bus ministepping indexer/drive	
PDX15-D	Packaged 5Apk, 70VDC bus ministepping indexer/drive and power dump	

Standard (Smooth) Motors

Part No.	Description	CE (LVD)
QM57-51-MO	Standard, size 23, (57-51) single-stack motor	
QM57-83-MO	Standard, size 23, (57-83) double-stack motor	
QM57-102-MO	Standard, size 23, (57-102) triple-stack motor	
QM83-62-MO	Standard, size 34, (83-62) single-stack motor	
QM83-93-MO	Standard, size 34, (83-93) double-stack motor	
QM83-135-MO	Standard, size 34, (83-135) triple-stack motor	
QM106-178-MO	Standard, Size 42, double-stack (106-178) motor	
QM106-205-MO	Enhanced, Size 42, double-stack (106-205) motor	

CE Size 23 Frame Motors

Part No.	Description	CE (LVD)
OS2HB-□□□□□	Standard, size 23, half-stack (57-40), B winding motor	
OS21B-□□□□□	Standard, size 23, single-stack (57-51), B winding motor	
OS22B-□□□□□	Standard, size 23, double-stack (57-83), B winding motor	

CE Size 34 Frame Motors

Part No.	Description	CE (LVD)
RS31B-□□□□□	Standard, size 34, single-stack (83-62), B winding motor	
RS32B-□□□□□	Standard, size 34, double-stack (83-93), B winding motor	
RS33B-□□□□□	Standard, size 34, triple-stack (83-135), B winding motor	

CE Size 42 Frame Motors

Part No.	Description	CE (LVD)
RS42B-□□□□□*	Standard, size 42, double-stack (106-178), B winding motor	
RE42B-□□□□□	Enhanced, size 42, double-stack (106-205), B winding motor	

Accessories

Part No.	Description	CE (EMC and LVD)
C10	LVD/EMC step motor cable kit (includes CE book, EMC 10-ft cable, gland (360°C shield connector), R-clamp, screw, assembly instructions)	

* Contact Compumotor for availability.

How to Order CE Motors

Size 23 Frame

Series	Type	Frame Size	No. of Rotor Stacks	Winding Type	Shaft	Shaft Modification	Motor Construction/ Hookup	Encoder Option
O (Octagonal)	S=Standard	2=Size 23 (2.5")	H=Half stacks 1=1 stack 2=2 stacks	B=170VDC winding (black painted motors)	S=Single D=Double	N=Standard (smooth)	FLY=Regular construction with flying (8) leads L10=Regular construction with 10-ft cables (call for availability)	Blank=No feedback RE=1000 ppr differential kit encoder with line driver with 12" flying leads (call for availability) RC=1000 ppr differential kit encoder with line driver with 10-ft cable (call for availability)

Size 34 Frame

Series	Type	Frame Size	No. of Rotor Stacks	Winding Type	Shaft	Shaft Modification	Motor Construction/ Hookup	Encoder Option
R (Round)	S=Standard	3=Size 34 (3.38")	1=1 stack 2=2 stacks 3=3 stacks	B=170VDC winding (black painted motors)	S=Single D=Double	N=Standard (smooth)	NPS=End bell/terminal board via 1/2" NPS Pipe thread C10=NPS option with (C10) LVD/EMC cable kit R10=Regular construction with non-CE marked 10-ft cables (S/ZETA/QM motor construction—not CE marked)	Blank=No feedback EC=1000 ppr differential encoder with line driver and 10-ft cable (-E Series) (call for availability)

Size 42 Frame

Series	Type	Frame Size	No. of Rotor Stacks	Winding Type	Shaft	Shaft Modification	Motor Construction/ Hookup	Encoder Option
R (Round)	S=Standard E=Enhanced	4=Size 42 (4.38")	2=2 stacks	B=170VDC winding (black painted motors)	S=Single D=Double	K=Straight Key	NPS=End bell/terminal board via 1/2" NPS Pipe thread C10=NPS option with (C10) LVD/EMC cable kit	Blank=No feedback EC=1000 ppr differential encoder with line driver and 10-ft cable (-E Series) (call for availability)

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