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CE (EMC and LVD)

PDHX-E Series

Packaged Drive/Indexer

The PDHX-E indexer version is equipped with the powerful X150E controller that accepts motion commands via RS-232C serial link. The command language is based on an enhanced version of Compumotor's popular X-Code, which is user friendly and extremely versatile. The indexer can store up to 64 complete motion programs in its non-volatile memory and offers advanced programming features such as conditional branching and math functions. With flexible input and output circuits compatible with virtually all PLC systems and the option of thumbwheel switch or remote operator panel control, the PDHX-E can be integrated into a wide range of industrial applications.

PD-E Series drives are supplied with comprehensive installation instructions to ensure that the completed system fully complies with the requirements of the EMC and low-voltage directives.

Features

- CE marked with full EMC and LVD compliance
- Meets emission directive without cabinet mounting
- Meets most stringent EMC directives relevant to motion control products
- Up to 32 drives can be daisy chained via RS-232C
- Non-volatile memory stores up to 64 motion programs
- 7-segment diagnostic display
- Dedicated inputs for end-of-travel and home position switches
- Ten user-definable inputs, 6 outputs
- Sinking or sourcing outputs; software selectable
- Optional remote panel or thumbwheel input
- High-speed (15 µS) registration input
- Internal noise suppression filter

Parker Automation

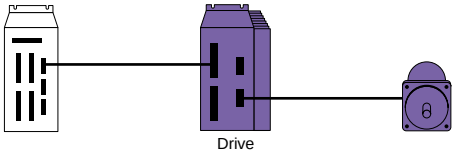
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Rohnert Park, California

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PDHX-E Specifications

Parameter	Value
AC Power Input	
Drive supply voltage	95VAC–264VAC (absolute limits)
Supply frequency range	47 to 63Hz
Power factor	Better than 0.9 over full input voltage and output power range
Maximum input power	300VA
Input current	3 A rms max
Recommended supply protection	3 A MCB type C characteristics
Performance	
Position range	±1 to 268,435,455 steps
Velocity range	0.0001 to 200 revs/sec
Acceleration range	0.06 to 999,999 revs/sec^2
Maximum encoder freq.	100kHz
User resolution range	1 to 32,767 steps/rev
Coordinate system	Incremental or absolute
Operating modes	Preset, preset with speed change, continuous, scaled following, preset following, registration
Indexer update time	2 milliseconds
Speed/Torque	Curves located on page C62
RS-232C Interface	
Connections	3-wire (Tx, Rx, Gnd), minimum voltage swing = ±3V
Parameters	9,600 baud, 8 data bits, 1 stop bit, no parity
Connector	8-way mini DIN or 9-way D-type
Configuration	Up to 32 interfaces can be controlled from a single RS232C port; device address set up by DIL switch
Protection	Drive shuts down and signals a fault in any of the conditions listed
Short-circuit	Across and between phase and phase to GND
Brownout	If DC Bus <50VDC
Overvoltage	If DC Bus >90VDC
Internal supplies	Any internal supply out of specification
Overtemperature	If internal temperature >90° (194°F)
Inputs	
Number	Ten user-definable inputs and 5 dedicated inputs. User-definable inputs can be assigned special functions such as trigger, motion kill, pause/continue, go direction, jog, data strobe, reset and motor shutdown. The dedicated input functions are home, end-of-travel limits, stop and auxiliary-in.
Connector	Screw (removable) terminal
Electrical	Optically isolated, inputs can be configured for 5V or 24V operation. Groups of inputs can be configured for either sinking or sourcing. In 5V mode, the input levels are low <2.5V, high >3.0V. In 24V mode, the input levels are low <5.7V, High >9.0V. Hysteresis on each input improves noise immunity.
Outputs	
Number	Six user-definable outputs. Outputs can be assigned special functions such as in-position, moving/not moving, program running, data strobe and fault.
Connector	Screw (removable) terminal
Electrical	Opto-isolated. Sinking (NPN) or sourcing (PNP) operation (software selectable). NPN: Max. OFF state voltage 30V, Max. current sink 300mA, ON state voltage of 2.5V at 300mA. PNP: Max. OFF state voltage 30V. Max. current source 300mA. ON state voltage of 2.5V at 300mA. [Note: PDHX-E supplies 160 mA (max). External 24VDC supply required to source more than 160 mA, up to 1.0A max]
Encoder Outputs	
Type	Buffered from motor encoder
Connector	15-pin D-type socket (user I/O)
Electrical	Quadrature A, B with Z channel. Differential TTL line driver. 100 kHz maximum frequency.
Motion Programs	
Storage	8000 characters of battery backed RAM
Program length	Variable up to memory limit
Number	64 programs
Execution	a) Command from serial port, b) Sequence selection inputs, c) Automatic execution at power-up, selected by XP command, d) RP240, e) TM8 Thumbwheel
Environmental	
Weight	2.9 Kg
Operating temperature range	0°–40°C (32°–104°F) or 50°C (122°F) if no user access to case
Ingress protection	IP20
Max power dissipation of drive unit	PDHX15E—30 watts; PDHX15E-D—45 watts

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CE Motor Speed/ Torque Curves

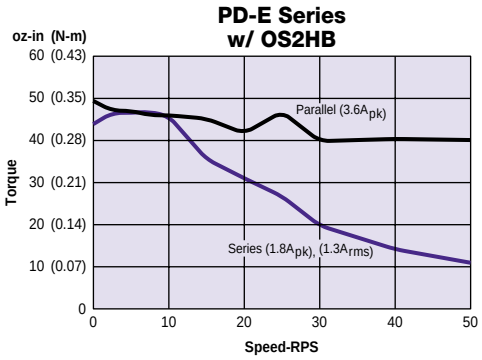
Power Dump Option

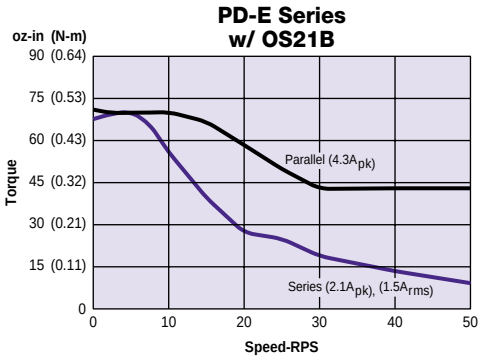
Applications involving rapid deceleration of high-inertia loads may require the addition of a circuit to dissipate the regenerated power. The need for a power dump will depend on the system inertia, the maximum speed and the deceleration time.

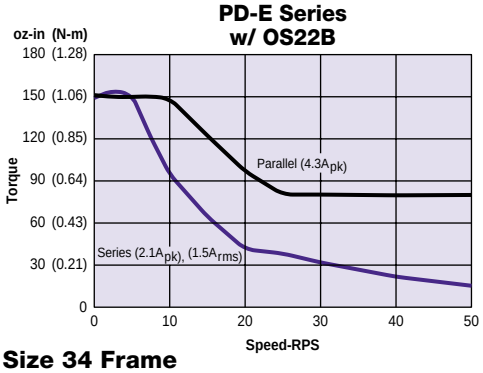
The -D version of the PD-E Series incorporates a power dump with a continuous rating of 15 watts (170 watts peak). This version is needed if the deceleration time in seconds from a maximum speed w is less than (Jw^2 - 0.1), where J is the total system inertia in Kg-m^2 (including the motor) and w is 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: ±10% torque variance due to motor tolerance.

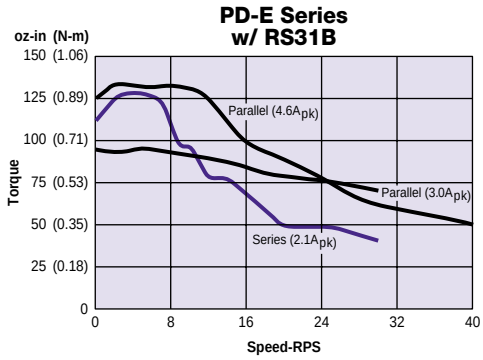
Size 23 Frame



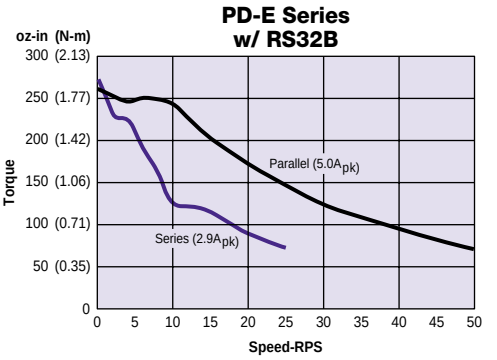


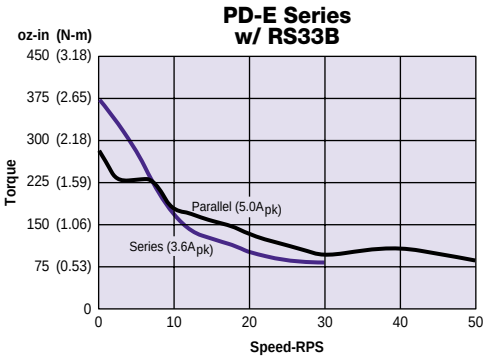


Size 34 Frame

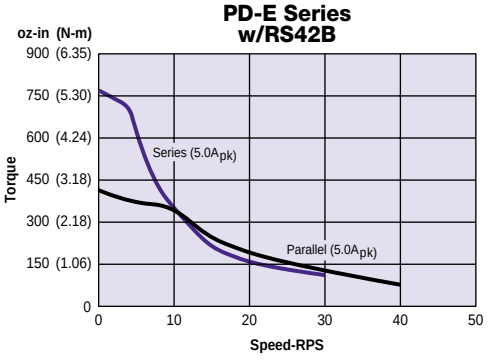


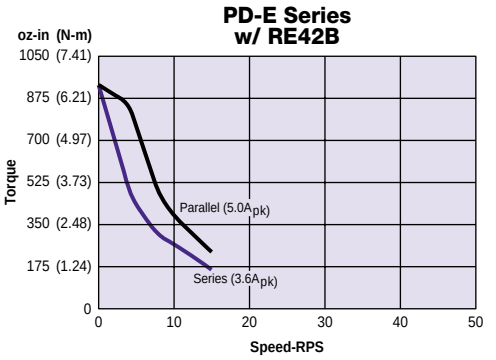
Size 34 Frame





Size 42 Frame





Drive's Peak Current Levels	
PDS13E	0.9–3.0 Apk
PDS15E/PDHX15E	2.5–5.0 Apk

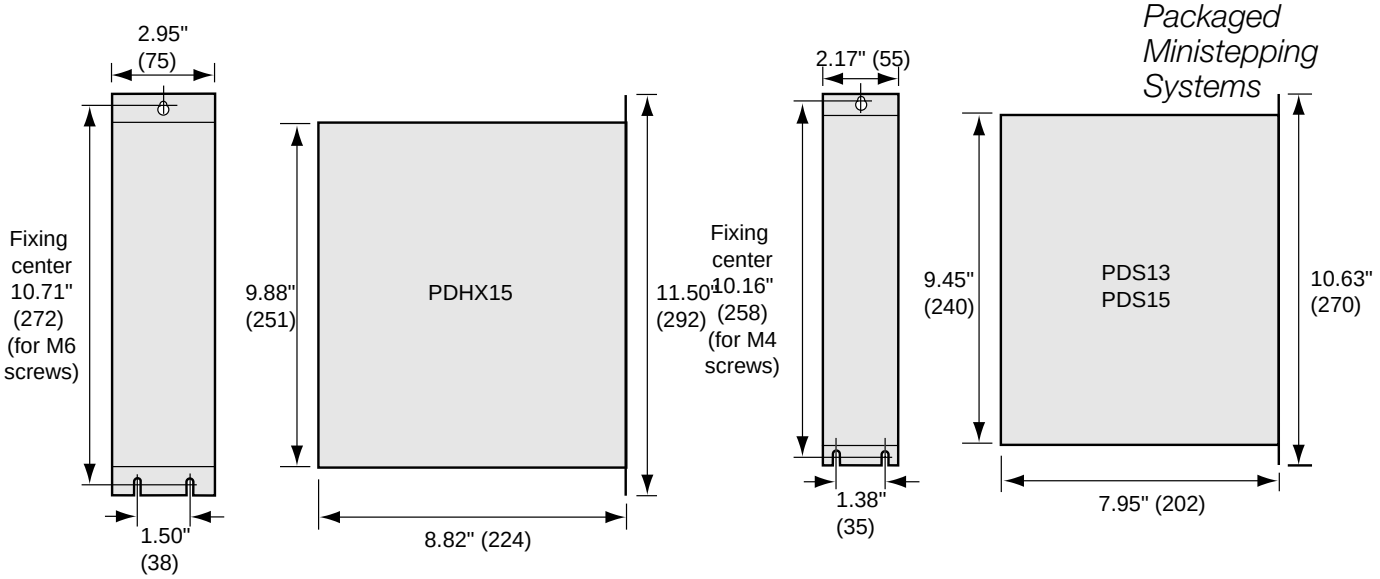
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PDS-E/ PDHX-E

EMC Compliance Packaged Ministepping Systems

Dimensions (—) denotes millimeters

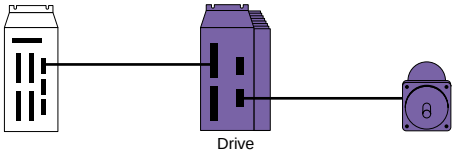


CE Motor Data

	Size 23 Frame			Size 34 Frame			Size 42 Frame	
	OS2HB	OS21B	OS22B	RS31B	RS32B	RS33B	RS42B	RE42B
Static torque								
oz-in	43	82	155	135	270	375	750	900
(Nm)	(0.30)	(0.58)	(1.09)	(0.95)	(1.91)	(2.65)	(5.30)	(6.35)
Rotor inertia								
oz-in^2	0.386	0.656	1.390	3.204	6.563	9.652	61.76	61.76
(kg-cm^2)	(0.070)	(0.119)	(0.253)	(0.583)	(1.195)	(1.757)	(11.30)	(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	2.5	4.0	7.0	8.8	18.0	27.0	41.7	81.0
(Nm)	(0.018)	(0.028)	(0.049)	(0.062)	(0.130)	(0.190)	(0.294)	(0.570)
Bearings Information								
Thrust Load								
lb	13	13	13	180	180	180	400	400
(kg)	(5.9)	(5.9)	(5.9)	(81.6)	(81.6)	(81.6)	(182)	(182)
Radial Load								
lb	20	20	20	35	35	35	140	140
(kg)	(9.1)	(9.1)	(9.1)	(15.9)	(15.9)	(15.9)	(63.6)	(63.6)
End Play *(Reversing load equal to 1 lb)*								
in	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001
(mm)	(0.025)	(0.025)	(0.025)	(0.025)	(0.025)	(0.025)	(0.025)	(0.025)
Radial Play *(Per 0.5 lb load)*								
in	0.0008	0.0008	0.0008	0.0008	0.0008	0.0008	0.0008	0.0008
(mm)	(0.02)	(0.02)	(0.02)	(0.02)	(0.02)	(0.02)	(0.02)	(0.02)
Motor Weight								
lb	1	1.5	2.5	3.2	5.3	7.6	18.2	18.2
(kg)	(0.45)	(0.68)	(1.14)	(1.45)	(2.41)	(3.45)	(8.26)	(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

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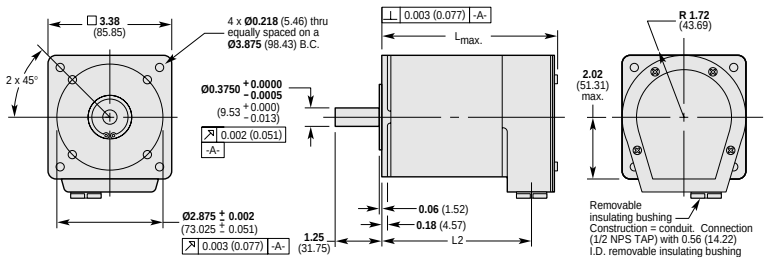


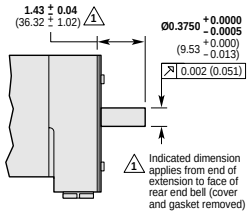
PD-E Series CE Motor Dimensions

Size 23 Frame, O Series

Size 34 Frame, R Series
End Bell Construction (NPS)

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)

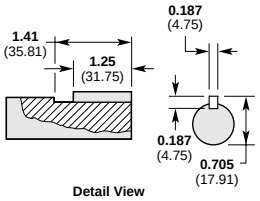




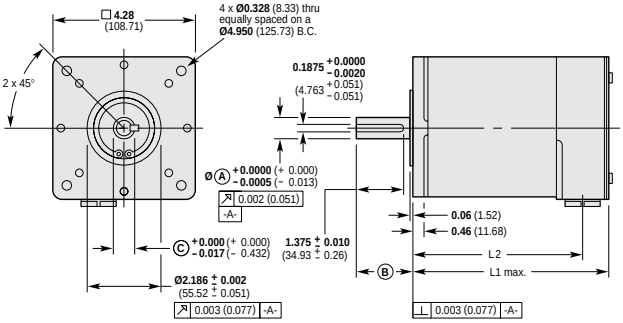
Double Shaft Configuration

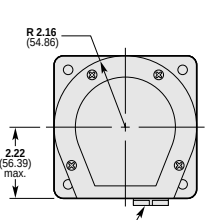
Size 42 Frame, R Series
End Bell Construction (NPS)

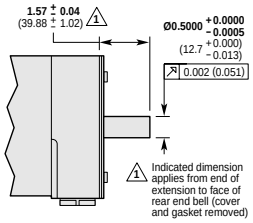
Model	Lmax	L2	A	B	C
RS42B–□□NPS	**8.04** (204.22)	**7.29** (185.17)	**0.625** (15.87)	**2.19** (55.63)	**0.705** (17.91)
RE42B–□□NPS	**8.04** (204.22)	**7.29** (185.17)	**0.625** (15.87)	**2.19** (55.63)	**0.705** (17.91)



Front Shaft Configuration (K)







Double Shaft Configuration

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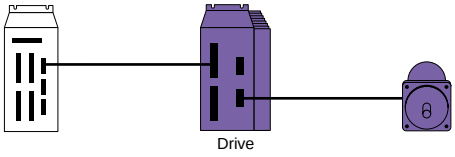
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PDHX-E Alphabetical Command Listing

#	Step sequence
;	Comment
A	Acceleration Rate
B	Buffer Status Request
BS	Buffer Size Request
C	Continue
CAG	Configure Acceleration Gain
CCP	Configure Current Clamp
CCS	Configure Command Source
CDG	Configure Derivative Gain
CEW	Configure In-Position Window
CFG	Configure Feedforward Gain
CIG	Configure Integral Gain
CIT	Configure In-Position Time
CIW	Configure Integral Action Window
CIX	Configure Index Resolution
CJL	Enter Motor + Load Inertia
CMR	Configure Motor Resolution
COFF	Configure Amplifier Offset
CPE	Configure Position Error
CPG	Configure Proportional Gain
CTG	Configure Filter Time Constant
CTQ	Enter Motor Torque
CUR	Configure User Resolution
CVG	Configure Velocity Gain
CVT	Configure Velocity Trip
D	Distance
DCLR	Clear RP240 display
DCNT	Enable/Disable the RP240 Pause/Continue keys
DFX	Display Flags Indexer
DIC	Display Indexer Counter
DLED	Turn RP240 LEDs on/off
DPA	Display Position Actual
DPC	Position cursor on RP240 display
DPE	Display Position Error
DPS	Display Position Setpoint
HALT	Halt
HELP	Produce Help Screens
ID	Immediate Distance
IF	If
IN	Define input functions
IO	Immediate Output
IS	Input Status
IV	Immediate Velocity
JA	Jog Acceleration
JV	Jog Velocity
K	Kill
KILL	Kill Motion
L	Loop
LA	Limit Deceleration
LD	Limit Disable
LS	Limit Switch Fast Stop
MC	Mode Continuous
MN	Mode Normal
MPA	Mode Position Absolute
MPI	Mode Position Incremental
MQ	Speed Change Mode
N	End Loop
NIF	End of IF
NWHILE	End of WHILE
O	Programmable Output
OFF	De-Energize Drive
ON	Energize Drive
OS	Other Switches
OSA	Home @ Index Pulse
OSB	Integral Action Selection
OSC	Monitor Command Reporting
OSE	Jog Enable
OSF	Initialization on Limit
OSJ	RAT 16/24 Bit select
OSK	Encoder Integrity Check
OSM	Integral Action Sensitivity
OSO	Suppress Units
OUT	Define output functions
P	Position
PIC	Picture
PR	Position Report
PS	Pause
PZ	Position Zero
QS	Transmit An Identifier
R	Report Control Module Status
RA	Report A – Limit Status Request
RAT	Set Rate Multiplier Value
RB	Report B – Miscellaneous Status Request
RE	Drive Status Request
REPEAT	Repeat
RFS	Return Servo to Factory Settings
RG	Report Go Home Status
RIFS	Return Indexer to Factory Settings
RPO	Report Power-On Time
RS	Report Sequence Status
RSE	Report Servo Errors
RST	Freeze Torque Demand
RV	Revision
S	Stop
SAVE	SAVE Parameters
SB	Stop Buffered
SIM	Set Indexer/ Following Mode
SKE	Skip On 'Equals'
SKN	Skip On 'Not Equal'
SP	Set current position to value
SS	Set Switches
SSA	RS232C Echo Control
SSD	Set Output 1 as Composite Fault Signal
SSG	Save Command Buffer On Limit
SSH	Save Command Buffer On Stop
SSI	Sequence Select Inputs
ST	Energize/De-Energize Drive
STOP	Stop Motion
SV	Save
T	Time Delay
TMRD	Read timer value from parallel I/O
TRD	Trigger On Input Distance
TRE	Trigger On Input Equal
TRIP	Trigger On In Poition
TRMN	Trigger on negative motor distance
TRMP	Trigger on positive motor distance
TRN	Trigger On Input Not Equal
TRR	Registration Mode
TUNE	Show Tuning Settings
TUNET	Self-Tune Servo (Torque Amplifier)
TUNEV	Self-Tune Servo (Velocity Amplifier)
U	Pause
UNTIL	Until
V	Velocity
VAR	Variables
VARD	Read variable from parallel I/O
VARn=FUN	Enable and read function keys (RP240)
VARn=NUM	Enable and read numeric keys (RP240)
VRD	Read velocity value from parallel I/O
WHEN	Set WHEN condition
WHILE	Set WHILE condition
XBS	Sequence memory available
XC	Checksum
XD	Sequence Download
XE	Sequence Delete
XG	GOTO sequence
XP	Power-On Sequence Number
XR	Run Sequence
XRD	read sequence from parallel I/O
XRP	Run/Pause Sequence
XRT	Return From Sequence
XSD	Sequence Download Status Report
XSR	Sequence Run Status Report
XSS	X Sequence Status
XT	Sequence Terminator
XTR	Set trace mode
XU	Sequence Upload
XWHEN	Set WHEN sequence
XZ	Reset Power-Up Sequence Mode
Y	Terminate Loop
Z	Reset

Note: The positioner card used in PDHX-E series drives is a general-purpose controller used in a range of products. The HELP screens displayed by the positioner include additional commands which are not relevant to the PDHX-E drive. These are identified in the user guide.

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Installation and Performance Data

The User Guide supplied with all PD-E Series drives provides detailed information on installation. The installation instructions must be closely followed if EMC compliance is to be maintained. They cover details such as mechanical mounting, safety earth connections and motor wiring. Since all necessary line filter components are an integral part of the drive, many potential problems associated with the mounting and wiring of external filter units are avoided.

The use of the correct motor cable and the method of termination are of prime importance. To comply with EMC, a CE (LVD) step motor and C10 option (LVD/EMC cable kit) are required.

Ordering Information

Drives

Part No.	Description CE (EMC and LVD)
PDS13E	Packaged 3Apk, 70VDC bus ministepping drive
PDS15E	Packaged 5Apk, 70VDC bus ministepping drive
PDS15E-D	Packaged 5Apk, 70VDC bus ministepping drive and power dump

Indexers/Drive

Part No.	Description CE (EMC and LVD)
PDHX15E	Packaged 5Apk, 70VDC bus ministepping indexer/drive
PDHX15D-E	Packaged 5Apk, 70VDC bus ministepping indexer/drive and power dump

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	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 HJ=512 ppr single-ended kit encoder with 12" flying leads 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		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 (4.33")	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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