

DC technology

# PL Series ...digital dc drives



up to  
**2000+HP**

**LA503846**  
dw Ethernet  
Through-Panel  
Port for closed  
door system  
access



## Standard Features

- Total digital control
- Basic peer-to-peer link
- 40 character backlit display
- Friendly, easy menu structure
- Modern, compact packaging
- Extensive, flexible, plug-in I/O
- RS232 serial port
- Easy configuration saving & cloning
- Built-in automatic field controller
- Built in programmable control functions for PID, winders, orientation, etc.
- Tach, encoder & arm volts feedback
- Easy reliable autotune

Size 4 & 5 drives include an embedded **speedy** Automation Controller for safe, doors closed, start up & operation with:

- Easy USB port interface
- Peer-to-peer Ethernet communications
- **drive.web** programmable control
- ModbusTCP over Ethernet
- Easy, safe, **savvyPanel** "Quick Start"
- see pages 20 & 21 for dw221 details -

## Optional:

- ModbusRTU RS485 serial port
- Devicenet, Profibus DP, fieldbus

## powerDRIVE Packages

PL/X DC drives up to 1200 horsepower are available in compact **powerDRIVE** packages complete with:

- Main contactor
- High speed 3-phase line fuses
- High speed armature fuse
- High speed control/field fuses
- Line filter (100HP & up)
- Optional motor blower starter (100HP & up)



# Key Features

## Analog Inputs & Outputs

8 analog inputs & 4 analog outputs (12 bits)  
 All outputs short circuit protected  
 All inputs over voltage protected up to +50v  
 Inputs configurable 5 to 30v  
 Input volts programmable up to +/-30v

## Digital Inputs & Outputs

17 digital inputs & 7 digital outputs  
 Digital I/O short circuit protected  
 Digital inputs over volts protected to +50v  
 (with settable switching levels)  
 Digital outputs over volts protected to +50v

## Speed Feedback - Standard

Analog tach  
 Encoder  
 Armature voltage  
 Encoder + armature volts  
 Encoder + analog tach

## Field Configurations

Fixed Current  
 Fixed voltage  
 Automatic field weakening  
 Delayed field quench  
 Standby field setting  
 Field economy

## Diagnostic Monitoring

Scope terminal monitors selectable values  
 All analog input voltages  
 All digital input states  
 All analog output voltages  
 All digital output states  
 Tach volts  
 Motor arm volts & amps  
 Field current  
 Output power Kw  
 AC supply volts

## User Configurable Software Functions

PID blocks, Parameter profiler, Winder reel diameter calculator, Winder taper tension calculator, Winder torque/inertia/friction compensator, Preset speed function, Two summers, Software "motorized pot", Interval timer, Current profiling, Zero speed with shaft position lock, Jog / crawl functions, Two filters, Dual motor swap, Latch, Sample & hold function, Auto self-tune current loop, Linear and S-ramps, Slack take-up, Batch Counter, Draw control.

## Engineered Configuration Packages

Pre-configured generic apps are available for Open & Closed Loop Winders, Position Controls, Coordinated Line Drives, Indexing, registration and others.

## Safe, "Doors Closed" Start Up & Operation

The optional dw221 Automation Controller is embedded as standard in size 4 & 5 for easy system wide access to configure, connect & control.

## Protection

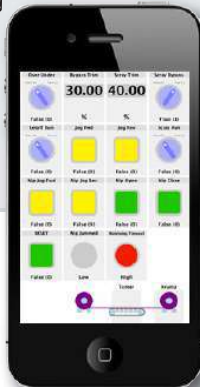
Interline device networks  
 High energy MOV's  
 Instantaneous overcurrent  
 Overcurrent ( inverse time)  
 Field fail and overcurrent  
 Motor over temperature  
 SCR (thyristor) over temp  
 Main power phase loss  
 Armature over volts  
 Over speed protection  
 Speed feedback mismatch  
 Stall protection  
 Standstill logic  
 SCR (Thyristor) trigger failure  
 Digital output short circuit

## Communications Ports

*drive.web* peer-to-peer Ethernet  
 ModbusTCP/IP Ethernet  
 USB port for easy network wide set up  
 Serial port (RS232)

## Optional Communications

Ethernet: EIP (PCCC)  
 ModbusRTU  
 Profibus DP



Easily add a **savvyPanel** touch screen HMI with secure WiFi interface

- Simple, intuitive configuration techniques with clear display of information
- No pots or switches to set
- Accurate display of voltages and currents
- Positive displacement pushbuttons for tactile feel
- High power processor and large memory will ensure ease of product enhancement in the future
- 2-button reset gets users back to OEM set up
- Powerful *savvy* graphical configuration, diagnostics & system design tools



Reliable, easy plug-in control terminals



The powerful *savvy* configuration tools are used for the PL Series DC drives, AC drives, *drive.web* programmable controllers, *savvyPanel* operator stations & complete systems.

# DC technology



↑ 75 HP, PLX50/123

powerPLX50/123 →  
With fuses, contactor  
& power components  
(shown hinged open  
for easy access)



↑ 400 HP, PL265/630

powerPL265/630 →  
With fuses, contactor  
& power components  
(shown with optional  
motor blower starter)



## Models & Ratings

### 4-Quadrant, Regenerative Drives

HP @ 500V arm 460VAC	HP @ 240V arm 230VAC	Armature Amps DC @ 40°C	Field Amps DC power(basic)	powerDRIVE Model	Dimensions W x H x D (weight) inches (LBS)	basicDRIVE Model	Dimensions W x H x D (weight) inches (LBS)	Line Reactor Model
20	10	36	5(8)	powerPLX15/36	8.5 x 11.4 x 11.7 (26)	PLX15/36	8.5 x 11.4 x 6.9 (16)	LM37
30	10	51	5(8)	powerPLX20/51	8.5 x 11.4 x 11.7 (26)	PLX20/51	8.5 x 11.4 x 6.9 (16)	LM52
60	25	99	5(8)	powerPLX40/99	8.5 x 11.4 x 11.7 (30)	PLX40/99	8.5 x 11.4 x 6.9 (17)	LM120
75	35	123	5(8)	powerPLX50/123	8.5 x 11.4 x 11.7 (30)	PLX50/123	8.5 x 11.4 x 6.9 (17)	LM120
100	50	164	10(16)	powerPLX65/164	16 x 33 x 9.7 (80)	PLX65/164	8.5 x 16.2 x 8.6 (27)	LM150
125	60	205	10(16)	powerPLX85/205	16 x 33 x 9.7 (80)	PLX85/205	8.5 x 16.2 x 8.6 (27)	LM195
150	75	270	10(16)	powerPLX115/270	16 x 33 x 9.7 (82)	PLX115/270	8.5 x 16.2 x 8.6 (28)	LM240
200	100	330	10(16)	powerPLX145/330	16 x 33 x 9.7 (89)	PLX145/330	8.5 x 16.2 x 8.6 (28)	LM300
250	125	405	20(32)	powerPLX185/405	16 x 43.5 x 14.4 (143)	PLX185/430	8.5 x 19.9 x 14.4 (43)	LM375
300	150	480	20(32)	powerPLX225/480	16 x 43.5 x 14.4 (145)	PLX225/530	8.5 x 19.9 x 14.4 (45)	LM480

### 2-Quadrant, Non-Reversing Drives

HP @ 500V arm 460VAC	HP @ 240V arm 230VAC	Armature Amps DC @ 40°C	Field Amps DC power(basic)	powerDRIVE Model	Dimensions W x H x D (weight) inches (LBS)	basicDRIVE Model	Dimensions W x H x D (weight) inches (LBS)	Line Reactor Model
20	10	36	5(8)	powerPL15/36	8.5 x 11.4 x 11.7 (26)	PL15/36	8.5 x 11.4 x 6.9 (16)	LM37
30	10	51	5(8)	powerPL20/51	8.5 x 11.4 x 11.7 (26)	PL20/51	8.5 x 11.4 x 6.9 (16)	LM52
60	25	99	5(8)	powerPL40/99	8.5 x 11.4 x 11.7 (30)	PL40/99	8.5 x 11.4 x 6.9 (17)	LM120
75	35	123	5(8)	powerPL50/123	8.5 x 11.4 x 11.7 (30)	PL50/123	8.5 x 11.4 x 6.9 (17)	LM120
100	50	164	10(16)	powerPL65/164	16 x 33 x 9.7 (80)	PL65/164	8.5 x 16.2 x 8.6 (27)	LM150
125	60	205	10(16)	powerPL85/205	16 x 33 x 9.7 (80)	PL85/205	8.5 x 16.2 x 8.6 (27)	LM195
150	75	270	10(16)	powerPL115/270	16 x 33 x 9.7 (82)	PL115/270	8.5 x 16.2 x 8.6 (28)	LM240
200	100	330	10(16)	powerPL145/330	16 x 33 x 9.7 (89)	PL145/330	8.5 x 16.2 x 8.6 (28)	LM300
250	125	405	20(32)	powerPL185/405	16 x 43.5 x 14.4 (143)	PL185/430	8.5 x 19.9 x 14.4 (43)	LM375
300	150	480	20(32)	powerPL225/480	16 x 43.5 x 14.4 (143)	PL225/530	8.5 x 19.9 x 14.4 (45)	LM480
400	200	630	20(32)	powerPL265/630	16 x 43.5 x 14.4 (154)	PL265/630	8.5 x 19.9 x 14.4 (45)	LM600

basicDRIVES must be installed with new contactor and the correct high speed SCR fuses to maintain the warranty

drive.web options see pages 24 - 25

Computer RS232 Communications Cable - Drive to DB9 - part number LA102595, included with every drive

For details of Drive Isolation Transformers, Line Reactors and Line Filters, please call +410-604-3400

# PL-Series Drives to 2000HP

## Models & Ratings

DC drives 400 HP to 2000 HP are normally available as **basicDRIVES** but can be supplied with **powerKITS** including:

- High speed fuses for line, armature & field
- Main DC contactor
- Line filter
- Flexible bus bar kits

(**basicDRIVES** must be installed with new power components to maintain the warranty)

Drives are available for either 6-pulse or 12-pulse, 460, 600 or 690 VAC configurations - please call for further information.



**savvyPanel touch**  
Easy HMI option

### DC Drives - 500 VDC Armature, 480VAC Supply

HP @	ARMATURE AMPS DC @ 40°C	FIELD AMPS DC Basic(Optional)	<b>basicDRIVE</b> 4-QUAD REGEN REVERSING	<b>basicDRIVE</b> NON-REVERSING	DIMENSIONS W x H x D (weight) INCHES (LBS) TOP CABLE ENTRY	OVERLOAD RATING
400	650	32 (50)	PLX275/650	PL275/650	10 x 30 x 13.8 (120)	150%, 25 SECS
450	750	32 (50)	PLX315/750	PL315/750	10 x 30 x 13.8 (120)	150%, 25 SECS
500	850	32 (50)	PLX360/850	PL360/850	10 x 30 x 13.8 (120)	150%, 25 SECS
575	950	32 (50)	PLX400/950	PL400/950	10 x 30 x 13.8 (120)	150%, 25 SECS
650	1050	32 (50)	PLX440/1050	PL440/1050	10 x 30 x 13.8 (120)	100%, CONT
750	1250	64	PLX520/1250	PL520/1250	20 x 30 x 13.8 (285)	150%, 25 SECS
895	1450	64	PLX600/1450	PL600/1450	20 x 30 x 13.8 (285)	150%, 25 SECS
1000	1650	64	PLX700/1650	PL700/1650	20 x 30 x 13.8 (285)	150%, 25 SECS
1140	1850	64	PLX800/1850	PL800/1850	20 x 30 x 13.8 (285)	150%, 25 SECS
1260	2050 @35°C	64	PLX900/2050	PL900/2050	20 x 30 x 13.8 (285)	150%, 25 SECS
1380	2250 @35°C	64	PLX980/2250	PL980/2250	20 x 30 x 13.8 (285)	100%, CONT

### DC Drives - 600 VDC Armature, 600VAC Supply

480	650	32 (50)	PLX275MV/650	PL275MV/650	10 x 30 x 13.8 (120)	150%, 25 SECS
550	750	32 (50)	PLX315MV/750	PL315MV/750	10 x 30 x 13.8 (120)	150%, 25 SECS
630	850	32 (50)	PLX360MV/850	PL360MV/850	10 x 30 x 13.8 (120)	150%, 25 SECS
700	950	32 (50)	PLX400MV/950	PL400MV/950	10 x 30 x 13.8 (120)	150%, 25 SECS
775	1050	32 (50)	PLX440/MV/1050	PL440MV/1050	10 x 30 x 13.8 (120)	100%, CONT
925	1250	64	PLX520MV/1250	PL520MV/1250	20 x 30 x 13.8 (285)	150%, 25 SECS
1075	1450	64	PLX600MV/1450	PL600MV/1450	20 x 30 x 13.8 (285)	150%, 25 SECS
1220	1650	64	PLX700MV/1650	PL700MV/1650	20 x 30 x 13.8 (285)	150%, 25 SECS
1370	1850	64	PLX800MV/1850	PL800MV/1850	20 x 30 x 13.8 (285)	150%, 25 SECS
1510	2050 @35°C	64	PLX900MV/2050	PL900MV/2050	20 x 30 x 13.8 (285)	150%, 25 SECS
1660	2250 @35°C	64	PLX980MV/2250	PL980MV/2250	20 x 30 x 13.8 (285)	100%, CONT

### DC Drives - 700 VDC Armature, 690VAC Supply

550	650	32 (50)	PLX275HV/650	PL275HV/650	10 x 30 x 13.8 (120)	150%, 25 SECS
650	750	32 (50)	PLX315HV/750	PL315HV/750	10 x 30 x 13.8 (120)	150%, 25 SECS
735	850	32 (50)	PLX360HV/850	PL360HV/850	10 x 30 x 13.8 (120)	150%, 25 SECS
820	950	32 (50)	PLX400HV/950	PL400HV/950	10 x 30 x 13.8 (120)	150%, 25 SECS
900	1050	32 (50)	PLX440HV/1050	PL440HV/1050	10 x 30 x 13.8 (120)	100%, CONT
1080	1250	64	PLX520HV/1250	PL520HV/1250	20 x 30 x 13.8 (285)	150%, 25 SECS
1250	1450	64	PLX600HV/1450	PL600HV/1450	20 x 30 x 13.8 (285)	150%, 25 SECS
1420	1650	64	PLX700HV/1650	PL700HV/1650	20 x 30 x 13.8 (285)	150%, 25 SECS
1600	1850	64	PLX800HV/1850	PL800HV/1850	20 x 30 x 13.8 (285)	150%, 25 SECS
1770	2050 @35°C	64	PLX900HV/2050	PL900HV/2050	20 x 30 x 13.8 (285)	150%, 25 SECS
1940	2250 @35°C	64	PLX980HV/2250	PL980HV/2250	20 x 30 x 13.8 (285)	100%, CONT

## DC powerDRIVES - 500 VDC Armature, 480 VAC Supply & powerKITS

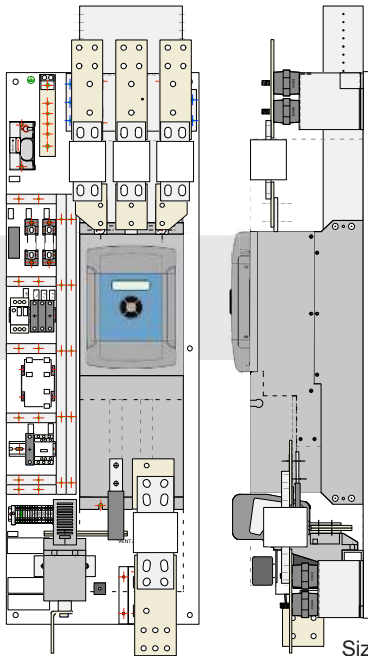
HP @ 500 VDC 460 VAC	ARMATURE AMPS DC @40°C	FIELD AMPS DC	FRAME SIZE	powerDRIVE w/contactor & fuses & <i>drive.web speedy</i>	Contactor Kit Contactor + mount bus bars & h/w	Fuse Kit Line, Regen Arm & Aux Fuses + mountings + h/w	Fan Supply Kit 460/230V Transfmr Fuses + h/w
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### REGENERATIVE, REVERSING, 4-QUADRANT DRIVES

400	650	32 (50)	4	powerPLX275/650	CON-800V700A	FPX650	FANSUPPLY4
450	750	32 (50)	4	powerPLX315/750	CON-800V850A	FPX750	FANSUPPLY4
500	850	32 (50)	4	powerPLX360/850	CON-800V850A	FPX850	FANSUPPLY4
575	950	32 (50)	4	powerPLX400/950	CON-800V1000A	FPX950	FANSUPPLY4
600	1000	64	5	powerPLX520/1000	CON-800V1200A	FPX1000	FANSUPPLY5
700	1150	64	5	powerPLX520/1150	CON-800V1200A	FPX1150	FANSUPPLY5
800	1350	64	5	powerPLX600/1350	CON-800V1750A	FPX1350	FANSUPPLY5
1000	1650	64	5	powerPLX700/1650	CON-800V1750A	FPX1650	FANSUPPLY5
1100	1750	64	5	powerPLX800/1750	CON-800V2000A	FPX1750	FANSUPPLY5
1200	1950	64	5	powerPLX900/1950	CON-800V2000A	FPX1950	FANSUPPLY5

### NON-REGENERATIVE, 2-QUADRANT DRIVES

400	650	32 (50)	4	powerPL275/650	CON-800V700A	FP650	FANSUPPLY4
450	750	32 (50)	4	powerPL315/750	CON-800V850A	FP750	FANSUPPLY4
500	850	32 (50)	4	powerPL360/850	CON-800V850A	FP850	FANSUPPLY4
575	950	32 (50)	4	powerPL400/950	CON-800V1000A	FP950	FANSUPPLY4
700	1150	64	5	powerPL520/1150	CON-800V1200A	FP1150	FANSUPPLY5
800	1350	64	5	powerPL600/1350	CON-800V1750A	FP1350	FANSUPPLY5
1000	1650	64	5	powerPL700/1650	CON-800V1750A	FP1650	FANSUPPLY5
1100	1750	64	5	powerPL800/1750	CON-800V2000A	FP1750	FANSUPPLY5
1200	1950	64	5	powerPL900/1950	CON-800V2000A	FP1950	FANSUPPLY5



Size 4 powerPL/X275 - 440

**NOTE 1:** For "doors closed", safe start up & maintenance practices, all size 4 & 5 drives have an embedded *drive.web speedy* with isolated USB and Ethernet ports as standard for full remote configuration & peer-to-peer Ethernet (see pages 20 & 21)

#### Dimensions

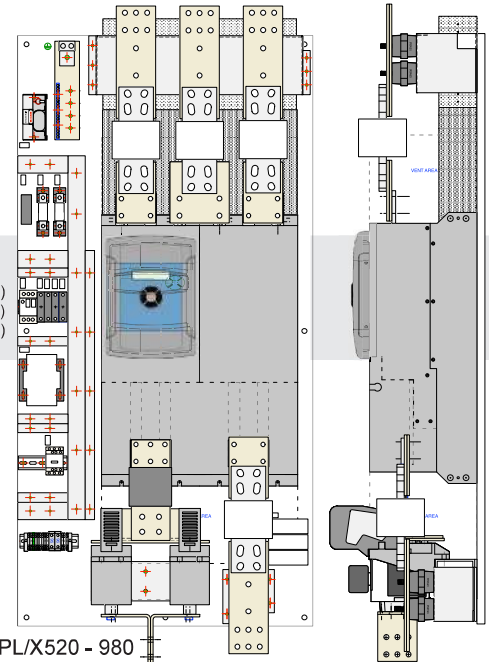
Size 4, 650A 18.5" w x 53.5" h x 14.1" d (470 x 1360 x 358mm)  
 Size 4 >650A 18.5" w x 59.6" h x 14.1" d (470 x 1512 x 358mm)  
 Size 5 30" w x 67" h x 16" d (762 x 1698 x 402mm)

#### Weight

235 lbs (108 kg)  
 240 lbs (110 kg)  
 575 lbs (260 kg)

**NOTE 2:** Please call for 600 & 690VAC *powerDRIVE* versions.

**NOTE 3:** Due to the weight and dimensions, size 5 powerDRIVES are shipped in two parts that will need to be assembled on site.



Size 5 powerPL/X520 - 980

## PLXD Separate Stack Controller

The PLXD is a great retrofit option for controlling large separate SCR stacks in either 6 or 12-pulse DC drive configurations and also for wound rotor motor SCR stack control. The unit has all the standard PL/X series drive features together with:

- Available for stacks up to 690 volts AC, 700 volts DC
- Built-in 32 amps fully automatic field controller (optional 50 amps rating)
- Separate gate pulse driver unit for greater noise immunity and reliability
- Optional current transformers
- Optional Ethernet and *drive.web* distributed control

Please call for details



# savvy tools for the PL/X DC drives

## drive.web automation

- Intuitive
- Easy
- Reliable
- Very smart!

click on a parameter to open the setter

click on a function block to drill down to the detail

↑ View the drive Signal Flow Diagram or  
← View the drive in Engineering Info

- Import or export data
- Monitor trend charts
- Edit the configuration
- Drag & drop links
- Access multiple drives

# drive.web smart drives



Add a **drive.web** module to any drive for unlimited automation capability:

- Powerful programmable control functions
- Peer-to-peer networking over Ethernet
- Smart iPad or touch screen PC operation
- Internet access

**smarty** - adds programmable control & extra I/O  
**speedy** - adds programmable control & gateway

- Get clear graphical signal flow system diagrams.
- Send event driven emails from your drive.
- All in one unique, intuitive, environment.

## powerSL Series

### Analog DC drives - up to 200HP

- powerSLX** Regen, reversing drive + field controller
  - powerSL** Non-reversing drive + field controller
  - powerSLE** Non-reversing OEM drive.
- Please call for details



## Power Quality For DC Drives

### Drive Isolation Transformers

Standard specification:  
NEMA 1 enclosed for indoor use  
K-factor 4  
Windings: Delta Primary, Wye Secondary  
Aluminum or Copper windings as indicated  
Taps at ± 5%  
Approvals: UL, C-UL

**Options**  
Outdoor enclosures  
Frequencies other than 60Hz  
Voltages other than 230/460/575 pri, 230/460 sec  
Special Taps  
Fungus Proofing  
80°C & 115°C Rise  
Copper Windings  
Electrostatic Shield  
K-13, K-20, K-30

Discount Schedule SX-1

Model	Specification
DIT3**	3KVA - Cu (2HP)
DIT6**	6KVA - Cu (5HP)
DIT11**	11KVA - AI (7.5HP)
DIT14**	14KVA - AI (10HP)
DIT20**	20KVA - AI (15HP)
DIT27**	27KVA - AI (20HP)
DIT34**	34KVA - AI (25HP)
DIT40**	40KVA - AI (30HP)
DIT51**	51KVA - AI (40HP)
DIT63**	63KVA - AI (50HP)
DIT75**	75KVA - AI (60HP)
DIT93**	93KVA - AI (75HP)
DIT118**	118KVA - AI (100HP)
DIT145**	145KVA - AI (125HP)
DIT175**	175KVA - AI (150HP)
DIT220**	220KVA - AI (200HP)
DIT275**	275KVA - AI (250HP)
DIT330**	330KVA - AI (300HP)
DIT440**	440KVA - AI (400HP)
DIT550**	550KVA - AI (500HP)
DIT660**	660KVA - AI (600HP)

### Line Reactors For 3-Phase DC Drives

Model Number	HP. at 230V	HP. at 460V	Arm Amps	Dimensions W x D x H	Mount Holes H x W	Weight LBS
LM18	5	10	20	6.0"x4.8"x3.1"	2.1"x2.0"	9
LM37	10	20	41	7.2"x5.6"x3.4"	2.3"x3.0"	11
LM52	15	30	58	7.2"x5.6"x3.8"	2.6"x3.0"	14
LM67	20	40	75	9.0"x7.0"x4.8"	3.2"x3.0"	23
LM82	25	50	91	9.0"x7.0"x4.8"	3.2"x3.0"	24
LM120	35	75	133	10.8"x8.2"x5.6"	3.5"x3.6"	43
LM150	40	100	166	10.8"x8.3"x5.6"	3.5"x3.6"	47
LM195	60	125	216	9.0"x7.1"x4.9"	3.2"x3.0"	29
LM240	75	150	266	10.8"x8.4"x5.8"	3.2"x3.6"	40
LM300		200	333	10.8"x8.4"x6.0"	4.2"x3.6"	48
LM375	100	250	416	10.8"x8.2"x7.3"	4.2"x3.6"	68
LM480	150	300	533	14.8"x14.0"x10.2"	5.9"x4.6"	125
LM600		400	666	15.5"x14.0"x11.5"	6.8"x4.6"	155
LM750	200	500	833	15.5"x14.0"x13.0"	6.8"x4.6"	180
LM900		600	1000	15.5"x14.0"x15.5"	9.3"x4.6"	290
LM1125		750	1250	22.0"x20.0"x14.8"	9.5"x7.2"	400

### Line Filter



LF3 Line Filter  
LF3-FK Line Filter Fuse Kit