Flex+Drive^{II} and MintDrive^{II} Brushless AC Servo Controls

The Flex+Drive^{II} and MintDrive^{II} Series of Brushless AC Servo Controls are a very flexible, versatile range to suit every application whether this is a simple analog command control, or a sophisticated single axis motion control. These controls have a common Windows® front end, and connector/pin outs.

Product Characteristics Overview

Feature	MintDrive^{II}	Flex+Drive^{II}	FlexDrive^{II}
Drive Characteristics			
+/-10V command reference (programmable 0-10V)	✓	✓	✓
Pulse and Direction input	✓	✓	✓
Resolver	✓	✓	✓
Encoder	✓	✓	✓
Absolute Encoder (EnDat)	✓	✓	✓
Auto-tune (current, velocity and position)	✓	✓	✓
Position latch for high speed registration	✓	✓	
Programming			
Mint command line	✓	✓	✓
Mint program support	✓	✓	
Multi-tasking	✓		
Programmable I/O	✓	✓	✓
Table driven PLC task for user defined operations	✓	✓	✓
Jog Window	✓	✓	✓
16/256 Preset positions and speeds	✓	✓	
Program size	64K	16K	
Non-volatile user parameter storage	✓		
Mint Interface Library (Windows API) Active X	✓	✓	✓
Move Types			
Jogging	✓	✓	✓
Absolute and relative positional moves	✓	✓	
Homing	✓	✓	
Gearing off master encoder with programmable gear ratio	✓	✓	✓
Cam profiling	✓		
Flying shears	✓		
Gearing with defined clutch distance	✓		
Options			
CANopen master for peer to peer networking	✓		
CANopen master for control of third party I/O devices	✓		
CANopen slave	✓	✓	✓
DeviceNet Slave	✓	✓	✓
Profibus-DP Slave	✓	✓	✓

MintDrive^{II}

The award-winning MintDrive^{II} integrates a powerful motion controller and brushless AC servo control into a single compact package. Programmable in multi-tasking MintMT, multi-tasking provides control for motion, HMI and PLC tasks. Supports positional moves, cams, flying shears, and software gearboxes.

Flex+Drive^{II}

The Flex+Drive^{II} provides 16 preset positions or speeds. An option expands this to 256 preset positions. Contains 16K memory (programmable in MintMT) and will support single task programming for indexing and gearing applications.

Fieldbus and I/O Options
A number of industry standard fieldbusses are available as factory fitted options for the Flex+Drive^{II} and MintDrive^{II}.

Option B: Dual CAN and I/O
- On MintDrive^{II}, provides two CAN channels
  CAN1 – CANopen. See Option C for information
  CAN2 - Baldor CAN – allows up to 63 Baldor I/O nodes to be added to the bus for expansion
- On Flex+Drive^{II}, provides one CANopen channel. See Option C for information.
- Provided on both Flex+Drive^{II} and MintDrive^{II} digital I/O expansion via 25-pin D-type connector, with
  10 digital inputs – 12-24V PNP/NPN opto-isolated.
  5 digital outputs – 12-24V PNP opto-isolated.
- The additional digital inputs expand the preset positions from 16 to 256.

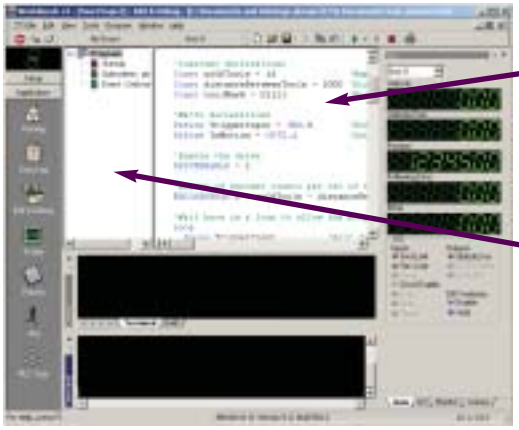
Option C: CANopen
- CANopen implementation according to CiA DS301 specification.
- Master implementation – MintDrive^{II} can be configuration as a manager node giving access to DS401 I/O devices such as digital I/O and analog I/O.
- DS403 implementation for HMI for communicating with Baldor operator panels.
- Flex+Drive^{II} can communicate with HMI panel or I/O devices if a manager is present on the bus (NextMovePCI, NextMove BX^{II} or MintDrive^{II})
- Peer-to-peer communication, allowing data transfer between Mint units, via the Comms Array.
- Mint provides full level functionality to monitor and control the state of the bus. Full access can be given to the Object Dictionary of any remote device.
- Two RJ45 connectors for easy data chaining of units.
- Optically isolated CAN drivers with internal 24V supply.

Option D: DeviceNet
- Only slave implementation.
- Conforms to ODVA DeviceNet Specification for the Position Control, device type 10h.
- Control of indexing moves for Flex+Drive^{II} and MintDrive^{II}.
- Velocity and torque control over DeviceNet.
- Access to Mint Comms Array allowing data transfer to Flex+Drive^{II} and MintDrive^{II}.
- Fault and position indicators, sent as an event.
- Maximum of 63 nodes possible over the network.
- Operating Baud rates of 125, 250 and 500kBits/sec.

Option P: Profibus-DP
- DP Slave implementation
- Default and custom process data definitions
- Access to status information such as actual Velocity, Torque, Position etc…
- Set-point data such as demand Speed or Torque or target position
- Access to local Drive I/O states
- Data exchange with user MintMT programs
- Up to 12Mbaud
- Simple 2 wire multi-drop cabling system with Standard 9 Pin D-Shell connection.

MintDrive^{II} Software Features

Programmed in multi-tasking MintMT, MintDrive^{II} is truly a flexible combined single axis motion controller and drive. With its flexible I/O arrangement and move types, MintDrive^{II} can easily take on the role of a machine controller, looking after the motion, PLC functionality and HMI tasks.



Full program editor with color highlighting of MintMT keywords. Dynamic syntax checking while you type.

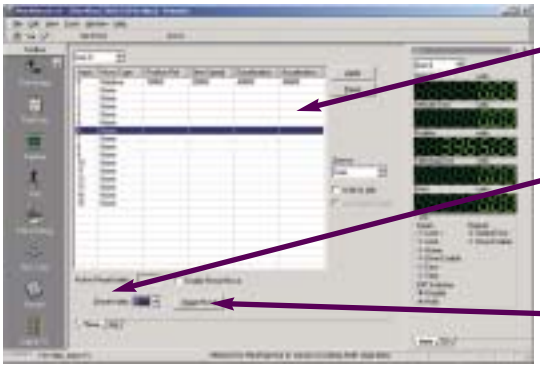
Program Navigator - showing program structure

Positional Moves
- Absolute and Relative
- Trapezoidal
- Speed Control

Master/follower
- Electronic Gearbox and Clutch
- Electronic Cam
- Flying Shear

Flex+Drive^{II} Software Features

The Flex+Drive^{II} is a versatile positioning drive supporting as standard 16 preset positions and jog speeds, with the option of expanding this to 256 preset positions. Each of the first 16 presets can be programmed with independent acceleration, deceleration and speed profile. Each move can be set for absolute or relative positioning to a home point. The Flex+Drive^{II} also supports as standard Mint programming for single task events.



Preset positions defined in a table. Can be exported for loading into another control.

Presets called from the Toolbox

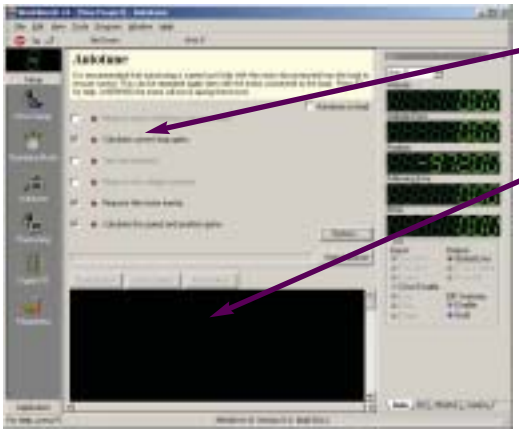
Trigger move from WorkBench or digital inputs

Positional Moves
- Absolute and Relative
- Trapezoidal
- Speed Control

Master/follower
- Electronic Gearbox

Setup

All the controls are setup using the Windows front end, WorkBench which supports many features to get you up and running quickly.



Select options for auto-tune

Output displays settings

- Motor selection database from motor catalog number or Baldor specification number.
- Autotuning of current, velocity and position loops. Options to measure motor resistance and inductance, motor inertia and detection of correct feedback alignment.
- PLC task for simple operations supporting AND and OR logic.
- Ability to record up to 32 error messages with time stamp.
- SupportMe features to simplify customer support. One click and WorkBench will collect all the data about the control which can then be emailed for support.

MintDrive^{II} Single Axis Motion Controller.

Ideally suited to operate
Brushless Motors – BSM Series,
Linear Brushless – LMCF and LMBL Series

Design Specifications

- 115 or 230 VAC direct on-line single phase 2.5, 5, 7.5A continuous current
- Universal 230-460 VAC direct on-line 3 phase 2.5 thru 27.5A continuous current
- Resolver feedback with simulated encoder output
- Optional encoder feedback with buffered ppr output
- Position, velocity and torque modes
- 2-14 bit analog inputs
- 2-8 bit analog outputs
- 8 digital inputs and 3 digital outputs for machine control I/O
- 5V and 24V pulse and direction

Features

- Powerful motion control functions
- Setup via Auto-Tuning
- Common Microsoft Windows® front-end with other Baldor motion controllers
- User Selectable RS232 and RS485 serial communications
- Point-to-point moves
- Software CAMs and gearing

Available Options

- Optional fieldbusses: CANopen, DeviceNet, Profibus-DP
- Resolver, encoder and absolute encoder options
- Optional 10 additional digital inputs and 5 outputs
- Optional External/Internal customer supplied 24 VDC logic supply

Protection Features

- Overvoltage protection
- Short Circuit Proof
- Over Temperature
- Over Current protection
- Undervoltage
- Motor I^2T protection
- Electronic fusing
- Loss of feedback protection
- Drive Overload
- Over Current Protection on Digital Outputs

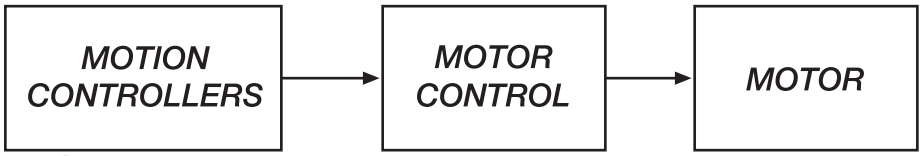
MintDrive^{II} Catalog Numbers

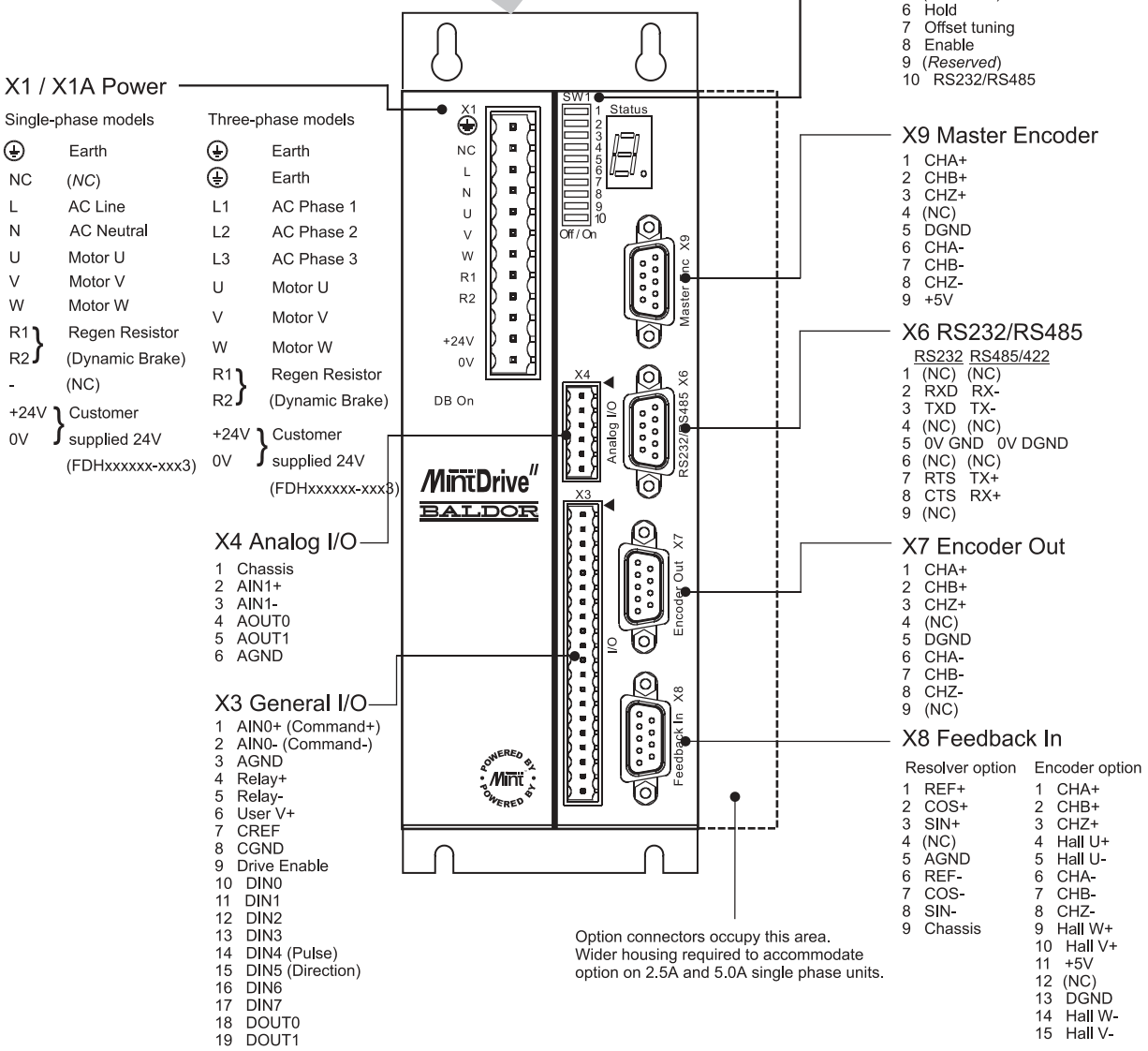
Input Voltage		115 VAC 1ϕ②	230 VAC 1ϕ②			230-460 VAC 3ϕ②⑥		
Bus Voltage		160VDC	300VDC			300-650 VDC		
Output Amps ①		Catalog	Catalog	Pkg.	Pkg.	Catalog	Pkg.	Pkg.
Cont.	Peak	No.⑨	No.⑨	Size	Size⑤	No.⑨	Size	Size⑤
With internal logic power supply								
2.5	5	MDH1A02TB-RN20	MDH2A02TB-RN20	A	B	–	–	–
5	10	MDH1A05TB-RN20	MDH2A05TB-RN20	C	D	–	–	–
7.5	15	MDH1A07TR-RN20	MDH2A07TR-RN20	D	D	–	–	–
Requires external +24V DC logic power supply								
2.5	5	MDH1A02TB-RN23	MDH2A02TB-RN23	A	B	MDH4A02TB-RN23	G	G
5	10	MDH1A05TB-RN23	MDH2A05TB-RN23	C	D	MDH4A05TB-RN23	G	G
7.5	15	MDH1A07TR-RN23	MDH2A07TR-RN23	D	D	MDH4A07TR-RN23	G	G
15	30	–	–	–	–	MDH4A15TR-RN23	H	H
20	40	–	–	–	–	MDH4A20TR-RN23	H	H
27.5	55	–	–	–	–	MDH4A27TR-RN23	H	H

NOTE: ① RMS Current
② 24V required for operation of I/Os (customer supplied).
③ 2.5 amp models have internal 20W 175 ohm (115/230 VAC) or 300W 200 ohm (400/460 VAC) regen resistor.
5 amp models have internal 40W 90 ohm (115/230 VAC) or 300W 200 ohm (400/460 VAC) regen resistor.
④ Logic supply code = 3. Customer must supply +24 VDC for logic supply.
⑤ Package Size with Bus Option Card.
⑥ Nominal input voltage range 230 - 460 VAC.
7) Order encoder model for operation with linear motors.
8) Order regen resistor for appropriate models, and motor and feedback cables separately.
⑨ These units have 8/3 I/O and no CAN ports (BUS Options N = None)

Typical Connections

The MintDrive^{II} is a single axis brushless AC servo control with integrated motion controller.



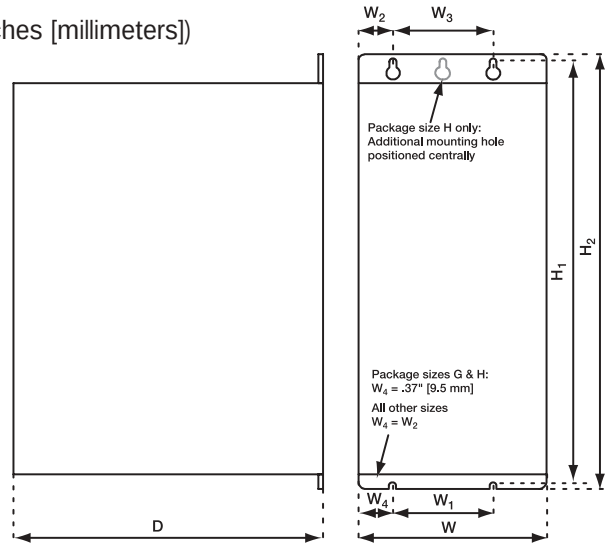


Technical Data

Description		Unit	Specification
Input Voltage	1 phase models	VAC	115, 1 phase (Range: 97-125)
			230, 1 phase (Range: 220-250)
	3 phase models	VAC	230-460, 3 phase (Range: 180-528)
Input Logic supply - Optional Customer Supplied		VDC	+20.4 to 28.8
		Amps	1.75
		Power on Surge	4A, 100ms @ 24 VDC
Output DC Bus Voltage		VDC	160 (115 VAC 1ϕ input)
		VDC	320 (230 VAC 1ϕ input)
		VDC	325 (230 VAC input) / 650 (460 VAC input)
Output Current	1 phase models	Amps	2.5, 5.0, 7.5
	3 phase models	Amps	2.5, 5.0, 7.5, 15, 20, 27.5
Efficiency		%	>95
Minimum Load Inductance		µH	200
Operating Altitude		Feet	3300 (Above derate 1.1% per 1000)
		Meters	1000 (Above derate 1.1% per 300)
Operating Temperature		°C	0 to +40 (Above derate 2.5%/°C to max 50°C)
		°F	32 to 104 (Above derate 1%/°F to max 122°F)
Storage Temperature		°C	-25 to +70
		°F	-13 to +158
Humidify		%	10 to 90 non-condensing
Shock		G	1G
Vibration		G	1G, 10-60 Hz

I/O Supply	Customer Supplied. Note: 24V is necessary for operation of I/O
On-board Memory	512K Flash for firmware and program storage. 512K Flash. 8K NVRAM for parameter storage
Feedback	Resolver/Encoder/Absolute Encoder
Resolver	14 bit, ±3 count accuracy
Simulated Output	512/1024/2048/4096
Encoder	Accepts three channel encoders (A, B and Z) with Hall Operates differential (TTL or RS 422) output type 12MHz quadrature counts 5V, 200mA power to encoder. 15-pin D-type
Digital Inputs	8 opto-isolated 24V Can be connected to positive or negative common (for use with NPN and PNP output transistors) Software configurable for forward and reverse limits, home, stop and drive error Software programmable level and edge triggered 2ms sample rate
Digital Outputs	3 opto-isolated 24V PNP Software configurable for Drive Okay. 50mA per channel, 350mA max source per channel, 500mA max for 3 channels
Fast Position Latch	Inputs configurable to latch position of axis position and master encoder in 1µs
Relay Output	Fault output. Normally closed. 1A @ 30VDC or 0.5A @ 125VAC
Analog Outputs	2 – 8 bit +/-10V. User Programmable
Analog Inputs/Command	2 – 14 bit resolution +/-10V
Reference	Programmable gain and offset
Master Encoder	One channel for synchronization and following applications. Incremental Encoder: RS422 differential AB signals with index (Z) pulse 2.5MHz maximum frequency
Pulse and Direction	+5 and +24 VDC Pulse and Direction programmable from inputs 4 and 5 or master encoder input maximum input frequency of 1 MHz
Serial Ports	User selectable via DIP switch for RS232 or RS485 communications RS232 – max Baud rate 57,600 for programming RS485 – max Baud rate 19,200 for programming and multi-drop communications 32 devices supported on RS485 port
Programming	MintMT - Multi-tasking Motion Basic

Dimensions (inches [millimeters])

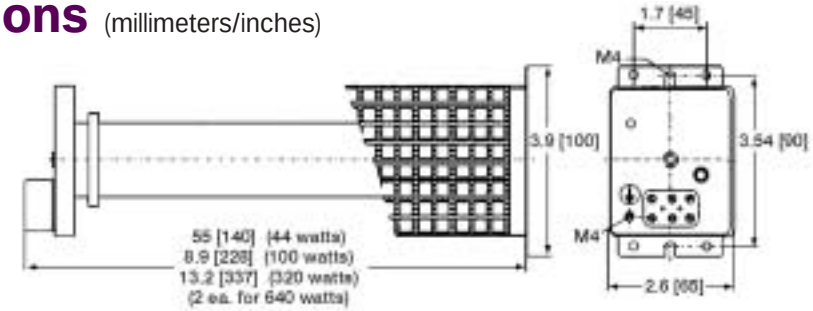


Package Size	Dimensions inches [mm]								Weight
	W	H	D	W_1	W_2	W_3	H_1	H_2	Lbs [Kgs]
A	2.66 [67.5]	6.81 [173]	6.00 [152]	1.57 [40]	0.59 [15]	1.57 [40]	7.70[195.5]	8.07 [205]	2.76 [1.25]
B	3.31 [84]	6.81 [173]	6.00 [152]	1.57 [40]	0.59 [15]	1.57 [40]	7.70[195.5]	8.07 [205]	3.42 [1.55]
C	3.64 [92.5]	6.81 [173]	6.00 [152]	1.57 [40]	0.91 [23]	1.57 [40]	7.70[195.5]	8.07 [205]	4.63 [2.1]
D	4.29 [109]	6.81 [173]	6.00 [152]	1.57 [40]	0.91 [23]	1.57 [40]	7.70[195.5]	8.07 [205]	5.07 [2.3]
G	2.56 [65]	14.06 [357]	10.31 [262]	1.81 [46]	1.28 [32.5]	–	15.12 [384]	15.75 [400]	10.8 [4.9]
H	5.12 [130]	14.06 [357]	12.91 [328]	4.37 [111]	1.08 [27.5]	2.95 [75]	15.12 [384]	15.75 [400]	19.95 [9.05]

Regen Resistors

115 VAC Drive			230 VAC Drive			460/400 VAC Drive		
	Regen Resistor			Regen Resistor			Regen Resistor	
Control	Catalog	Watts	Control	Catalog	Watts	Control	Catalog	Watts
MDH1A07TR-	RG22	100	MDH2A07TR-	RG39	100	MDH4A07TR-	RG68	320
						MDH4A15TR-	RG27A	320
						MDH4A20TR-	RG27A	320
						MDH4A27TR-	RG11	640

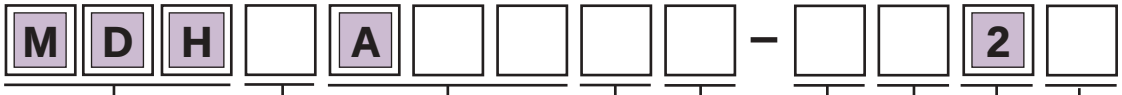
Dimensions (millimeters/inches)



Filters for CE

Control Continuous Current Rating	Input Voltages			Customer Supplied 24 VDC
	115 VAC 1ϕ	230 VAC 1ϕ	230-460 VAC 3ϕ	
2.5A	FI0015A01	FI0014A00	FI0018A00	
5.0A	FI0015A00	FI0015A01	FI0018A00	
7.5A	FI0015A02	FI0015A0	FI0018A00	All models
15A	—	—	FI0018A01	FI0014A00
20A	—	—	FI0018A01	
27.5A	—	—	FI0018A01	

Catalog Identification Matrix (Note that catalog ID has been revised for MDH series)



CONTROL FAMILY
MDH = MintDrive^{II}

INPUT VOLTAGE
1 = 115 V 1ϕ
2 = 230 V 1ϕ
3 = 230-460 V 3ϕ

CURRENT CODE
A02 = 2.5 amps
A05 = 5 amps
A07 = 7.5 amps
A15 = 15 amps
A20 = 20 amps
A27 = 27 amps
} 3ϕ only

ENCLOSURE TYPE
T = Panel mount with Internal Power Supply

BRAKING OPTIONS
R = Requires external resistor
B = Built in regen resistor

FEEDBACK OPTIONS
R = Resolver
E = Encoder
D = Absolute Encoder

BUS OPTIONS ①
N = None
B = CAN + Extra I/O
C = 1 CAN Channel
D = DeviceNet
P = Profibus-DP

SERIAL PORT
2 = RS232/RS485

LOGIC SUPPLY VOLTAGE OPTIONS
0 = Internally generated
3 = External Customer supplied +24 VDC

NOTE: Not all options are available on all controls. Contact your local Baldor office.
① Options may increase product width.
② Basic unit has 8/3 I/O and no CAN ports.

Accessories

Description	Catalog Number
HMI Operator Panel (Base Unit)	KPD007-501
HMI Operator Panel (Full Featured)	KPD008-501
HMI Operator Panel (Touch Screen Monochrome)	KPD009-501
HMI Operator Panel (Touch Screen Color)	KPD009-502
CANBus Module for HMI Panel	OPT032-501
Baldor Motion Toolkit	SW1277
Auxiliary I/O Breakout Board for FieldBus Option “B”	OPT017-501

Description	Cable Assembly Catalog Number	Length	
		Meters	Feet
CAN Cables	CBL004-501	0.25	0.8
	CBL004-502	0.50	1.6
	CBL004-503	1	3.2
	CBL004-504	2	6.5
	CBL004-505	3	9.8
	CBL004-506	5	16.3
	CBL004-507	10	32.7
	CBL004-508	25	81.8
Auxiliary I/O Breakout Board Cable	CBL022-502	2	6
RS232 Serial Cable for Use with PC	CBL001-501	3`	9.8

Flex+Drive^{II}

The Flex+Drive^{II} from Baldor integrates a powerful motion controller and brushless AC servo into a compact package capable of incremental positioning. Up to 16 pre-set point-to-point moves can be programmed into the drive, and if you need more, it can be expanded to 256. Moves may be incremental or absolute. Contains 16K memory (programmable in MintMT) and will support single task programming for indexing and gearing applications.

Ideally suited to operate
Brushless Motors – BSM Series,
Linear Brushless – LMCF and LMBL Series

Design Specifications
- Control Brushless or Linear Motors
- Direct 115/230 1ϕ
- Direct 230-400/460 3ϕ
- Standard Resolver Feedback
- Simulated Encoder Output
- Setup via Software
- 16 Pre-set Programmable Positions, Expandable to 256
- 16 K of Memory for Single Event Programming
- Common Microsoft Windows® Front End, Shared with Motion Controllers

Available Options
- CAN-Bus, DeviceNet, Profibus-DP
- Encoder Feedback
- Absolute Encoder Feedback
- External Customer Supplied 24VDC Logic Supply
- 10 Additional Digital Inputs and 5 Additional Outputs

Velocity
- Standard ± 10 VDC
- Velocity/Current Mode of Operation
- +5 VDC & +24 VDC Pulse and Direction Input
- Electronic Handwheel (Pulse Follower) Input
- Setup via Auto-Tuning

Special Features
- Customer selectable RS232/RS485
- 8 Digital Inputs
- 3 Digital Outputs
- 7 Segment Diagnostic Display
- Auto-Tuning (Even Position!)
- Position Latch for High Speed Registration
- Mint Program Support
- Absolute and Relative Moves
- Homing

Protection Features
- Overvoltage
- Short Circuit Proof
- Over Temperature
- Over Current
- Resolver Fault
- Under Voltage
- Motor I^2t
- Electronic Fusing
- Drive Overload
- Loss of Feedback
- Electronic Fusing
- Over Current Protection on Digital Outputs

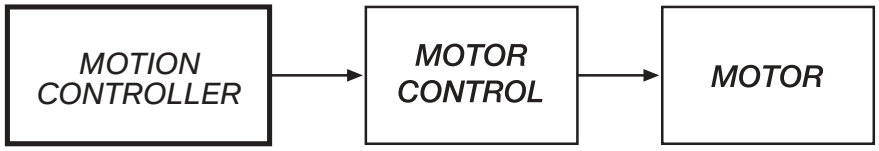
Flex+Drive^{II} Catalog Numbers

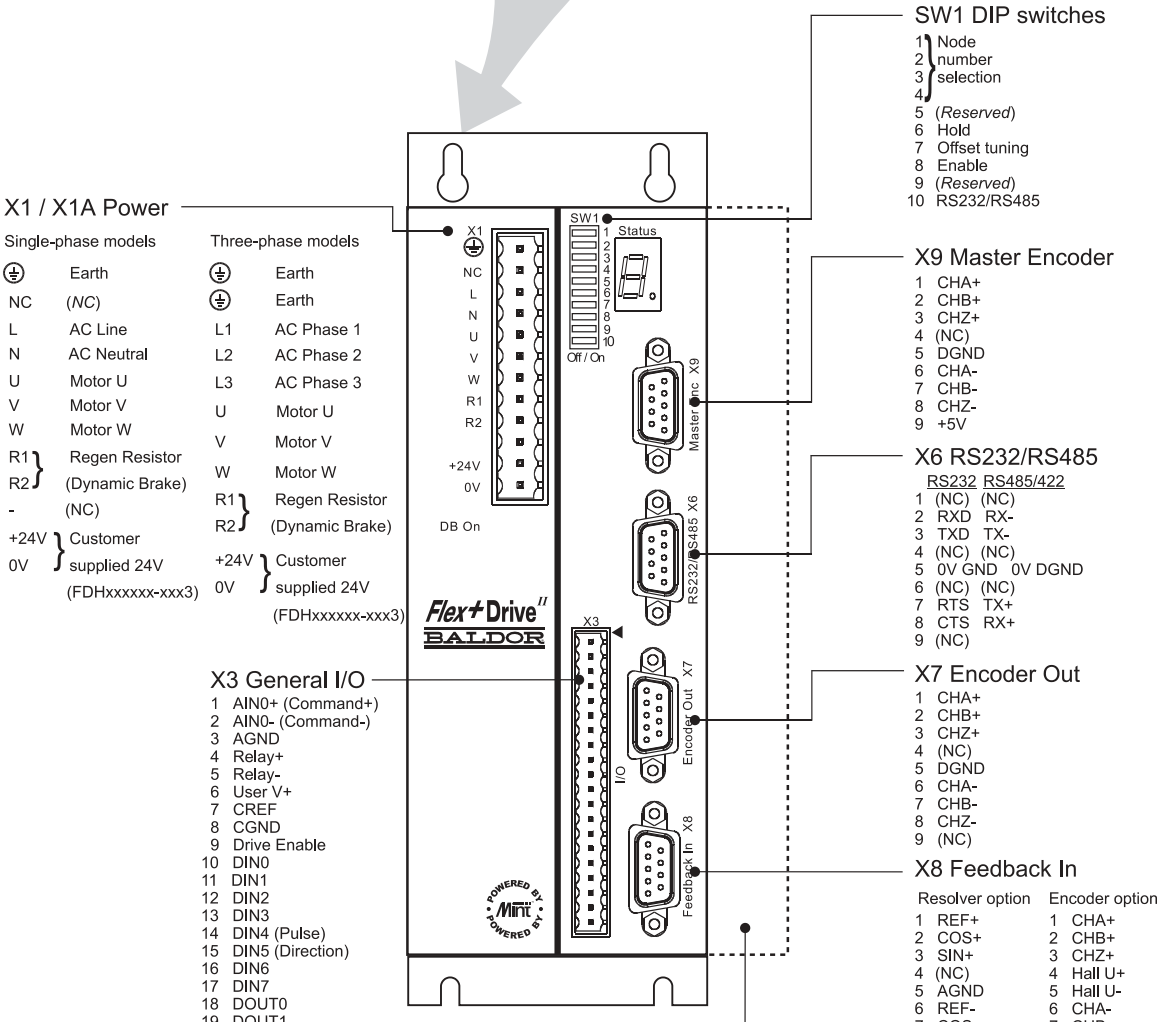
AC Input Voltage Bus Voltage		115 VAC 1ϕ ② 160 VDC	230 VAC 1ϕ ② 300 VDC			400/460 VAC 3ϕ ②⑥ 565/650 VDC		
Output Amps ①		Catalog	Catalog	Pkg.	Pkg.⑤	Catalog ④	Pkg.	Pkg.⑤
Cont.	Peak	Number	Number	Size	Size	Number	Size	Size
2.5	5	FPH1A02TB-RN20 ③	FPH2A02TB-RN20 ③	A	B	FPH4A02TB-RN23 ③	G	G
5	10	FPH1A05TB-RN20 ③	FPH2A05TB-RN20 ③	C	D	FPH4A05TB-RN23 ③	G	G
7.5	15	FPH1A07TR-RN20	FPH2A07TR-RN20	D	D	FPH4A07TR-RN23	G	G
15	30	–	–	–	–	FPH4A15TR-RN23	H	H
20	40	–	–	–	–	FPH4A20TR-RN23	H	H
27.5	55	–	–	–	–	FPH4A27TR-RN23	H	H

NOTE: ① RMS Current
② 24V required for operation of I/Os (customer supplied).
③ 2.5 amp models have internal 20W 175 ohm (115/230 VAC) or 300W 200 ohm (400/460 VAC) regen resistor.
5 amp models have internal 40W 90 ohm (115/230 VAC) or 300W 200 ohm (400/460 VAC) regen resistor.
④ Logic supply code = 3. Customer must supply +24 VDC for logic supply.
⑤ Package Size with Bus Option Card.
⑥ Nominal input voltage range 230 - 460 VAC.
7) Order encoder model for operation with linear motors.
8) Order regen resistor for appropriate models, and motor and feedback cables separately.

Typical Connections

The Flex+Drive^{II} is used for applications needing repeatable moves. It allows for up to 16 different positions to be "pre-set" in memory (expandable to 256). A specific "pre-set" position is selected through the "switch inputs" and the "trigger" input activates the move. Repeatable moves become easy to accomplish, with this simple to program, stand alone package. Flex+Drive^{II} can also be used for single axis applications requiring programmable position moves.



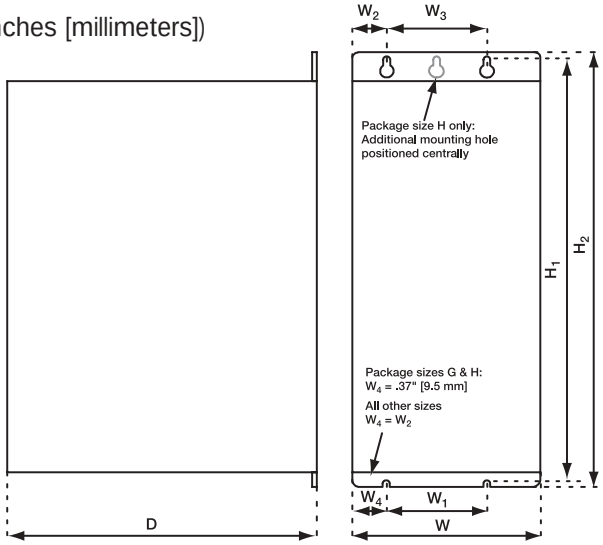


Technical Data

Description	Unit	Specification
Input Voltage 1 phase models	VAC	115, 1 phase (Range: 220-250)
		230, 1 phase (Range: 180-528)
Input Voltage 3 phase models	VAC	230-460, 3 phase (Range: 184-253)
Input Logic supply - Optional Customer Supplied	VDC	+20.4 to 28.8 VDC
	Amps	1.75A
	Power on Surge	4A, 100ms @ 24 VDC
Output DC Bus Voltage		160 (115 VAC 1ϕ input)
	VDC	320 (230 VAC 1ϕ input)
		325 (230 VAC input) / 650 (460 VAC input)
Output Current	Amps	2.5, 5.0, 7.5 (1ϕ input models)
		2.5, 5.0, 7.5, 15, 20, 27.5
Efficiency	%	>95
Minimum Load Inductance	µH	200
Operating Altitude	Feet	3300 (Above derate 1.1% per 1000)
	Meters	1000 (Above derate 1.1% per 300)
Operating Temperature	°C	0 to +40 (Above derate 2.5%/°C to max 50°C)
	°F	32 to 104 (Above derate 1%/°F to max 122°F)
Storage Temperature	°C	-25 to +70
	°F	-13 to +158
Humidify	%	10 to 90 non-condensing
Shock		1G
Vibration		1G, 10-60 Hz

External 24V Logic Supply	Optional for single phase controls 24VDC @1.75A. Power on surge of 4A for 100ms
I/O Supply	Customer Supplied Note: 24V is necessary for operation of I/O
On-board Memory	512K Flash for firmware and program storage 512K Flash
Feedback	Resolver/Encoder/Absolute Encoder
Resolver	14 bit, ±3 count accuracy
Simulated Output	512/1024/2048/4096
Encoder	Accepts three channel encoders (A, B and Z) with Hall Operates differential (TTL or RS 422) output type 12MHz quadrature counts 5V, 200mA power to encoder 15-pin D-type
Digital Inputs	8 opto-isolated 24V Can be connected to positive or negative common (for use with NPN and PNP output transistors) Software configurable for forward and reverse limits, home, stop and drive error Software programmable level and edge triggered 2ms sample rate
Digital Outputs	3 opto-isolated 24V PNP Software configurable for Drive Okay. 50mA per channel, 350mA max source per channel, 500mA max for 3 channels
Fast Position Latch	Inputs configurable to latch position of axis position and master encoder in 1µs
Relay Output	Fault output Normally closed. 1A @ 30VDC or 0.5A @ 125VAC
Analog Inputs/Command	1 – 14 bit resolution +/-10V
Reference	Programmable gain and offset
Master Encoder	One channel for synchronization and following applications. Incremental Encoder: RS422 differential AB signals with index (Z) pulse 2.5MHz maximum frequency
Pulse and Direction	Pulse and Direction programmable from inputs 4 and 5 or master encoder input maximum input frequency of 1 MHz
Serial Ports	User selectable via DIP switch for RS232 or RS485 communications RS232 – max Baud rate 57,600 for programming RS485 – max Baud rate 19,200 for programming and multi-drop communications 32 devices supported on RS485 port

Dimensions (inches [millimeters])



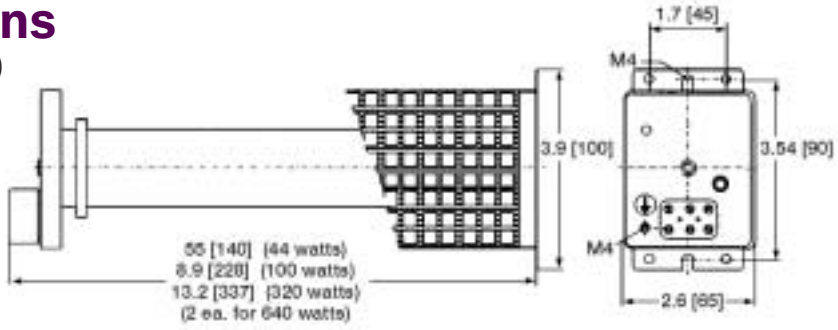
Package Size	Dimensions inches [mm]							Weight	
	W	H	D	W_1	W_2	W_3	H_1	H_2	Lbs [Kgs]
A	2.66 [67.5]	6.81 [173]	6.00 [152]	1.57 [40]	0.59 [15]	1.57 [40]	7.70[195.5]	8.07 [205]	2.76 [1.25]
B	3.31 [84]	6.81 [173]	6.00 [152]	1.57 [40]	0.59 [15]	1.57 [40]	7.70[195.5]	8.07 [205]	3.42 [1.55]
C	3.64 [92.5]	6.81 [173]	6.00 [152]	1.57 [40]	0.91 [23]	1.57 [40]	7.70[195.5]	8.07 [205]	4.63 [2.1]
D	4.29 [109]	6.81 [173]	6.00 [152]	1.57 [40]	0.91 [23]	1.57 [40]	7.70[195.5]	8.07 [205]	5.07 [2.3]
G	2.56 [65]	14.06 [357]	10.31 [262]	1.81 [46]	1.28 [32.5]	–	15.12 [384]	15.75 [400]	10.8 [4.9]
H	5.12 [130]	14.06 [357]	12.91 [328]	4.37 [111]	1.08 [27.5]	2.95 [75]	15.12 [384]	15.75 [400]	19.95 [9.05]

Regen Resistors

115 VAC Drive			230 VAC Drive			460/400 VAC Drive		
	Regen Resistor			Regen Resistor			Regen Resistor	
Control	Catalog	Watts	Control	Catalog	Watts	Control	Catalog	Watts
FPH1A07TR-	RG22	100	FPH2A07TR-	RG39	100	FPH4A07TR-	RG68	320
						FPH4A15TR-	RG27A	320
						FPH4A20TR-	RG27A	320
						FPH4A27TR-	RG11	640

Dimensions

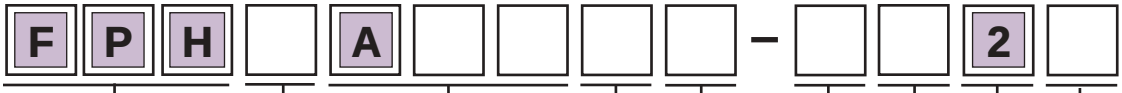
(inches [millimeters])



Filters for CE

Control Continuous Current Rating	Input Voltages			Customer Supplied 24 VDC
	115 VAC 1ϕ	230 VAC 1ϕ	230-460 VAC 3ϕ	
2.5A	FI0015A01	FI0014A00	FI0018A00	
5.0A	FI0015A00	FI0015A01	FI0018A00	
7.5A	FI0015A02	FI0015A0	FI0018A00	All models
15A	—	—	FI0018A01	FI0014A00
20A	—	—	FI0018A01	
27.5A	—	—	FI0018A01	

Catalog Identification Matrix (Note that catalog ID has been revised for FPH series)



CONTROL FAMILY
FPH = Flex+Drive^{II}

INPUT VOLTAGE
1 = 115 V 1ϕ
2 = 230 V 1ϕ
3 = 230-460 V 3ϕ

CURRENT CODE
A02 = 2.5 amps
A05 = 5 amps
A07 = 7.5 amps
A15 = 15 amps
A20 = 20 amps
A27 = 27 amps
} 3ϕ only

ENCLOSURE TYPE
T = Panel mount with Internal Power Supply

BRAKING OPTIONS
R = Requires external resistor
B = Built in regen resistor

FEEDBACK OPTIONS
R = Resolver
E = Encoder
D = Absolute Encoder

BUS OPTIONS ①
N = None
B = CAN + Extra I/O
C = 1 CAN Channel
D = DeviceNet
P = Profibus-DP

SERIAL PORT
2 = RS232/RS485

LOGIC SUPPLY VOLTAGE OPTIONS
0 = Internally generated
3 = External Customer supplied +24 VDC

NOTE: Not all options are available on all controls. Contact your local Baldor office.
① Options may increase product width.