

MOTOR CONTROL

**REGAL**

**MARATHON  
VARIABLE SPEED DRIVES**



**marathon**<sup>™</sup>  
Drives

**REGAL**

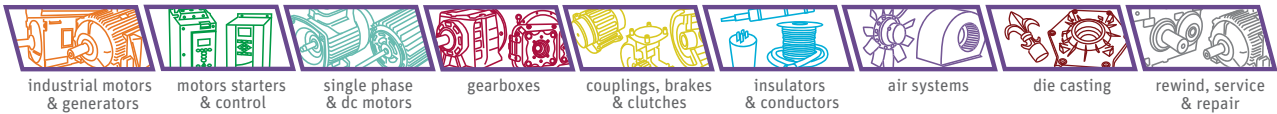
[www.regalaustralia.com.au](http://www.regalaustralia.com.au)

## History & Foundation

Regal Beloit Corporation was established in Wisconsin in 1955 where they set up operations in a Beloit Roller Rink manufacturing cutting tools and gearboxes. Since then its product line has expanded to include motors, generators, drive control systems and power transmission products. It was officially listed on the New York stock exchange in 2005.

Today Regal is a truly global company with presence in Canada, United States of America, Mexico, Brazil, Germany, Italy, India, China, Japan, Thailand, New Zealand, Australia, and other countries including manufacturing sites in 63 locations and 16 design centres around the globe.

Regal Beloit Australia offer a broad product range of products from motors, motor control & drives, gearboxes, brakes and couplings through to winding wire, insulation material, cables, varnishes and air systems to name a few. With strong brands such as Marathon, CMG, Fasco, Durst, Mastergear and Emerson, Regal Australia can assist with all your electro mechanical, power transmission, speed control and air system needs.



## Warranty Period

You can feel peace of mind knowing your Marathon Drive is covered by a 12 month product warranty (dated from product purchase) covering product malfunctions, under normal operating conditions.

## Approvals



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# MD100G

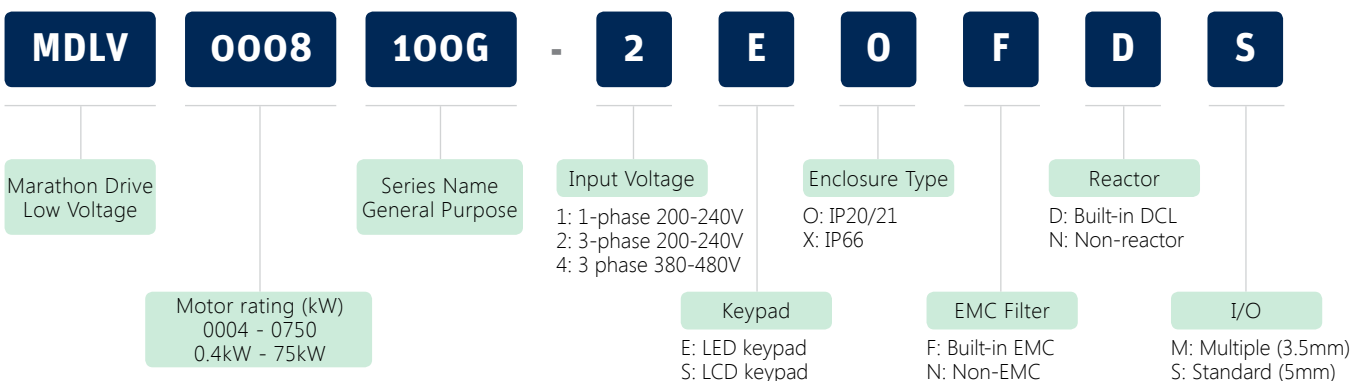
## General Purpose Variable Speed Drive

- 1 phase 0.4 - 2.2kW, 200-240V
- 3 phase 0.4 - 15kW, 200-240V
- 3 phase 0.4 - 75kW, 380-480V



- Selectable V/f, sensorless vector control
- Built-in EMC filter
- Side by side installation
- Enhanced size competitiveness
- PLC function (simple sequence operation)
- Compliance with open field networks - Profibus-DP, CANopen, EtherNet
- IP20/21 enclosure (0.4 - 75kW)
- IP66 enclosure (0.4 - 22kW)
- PM sensorless control
- P2P I/O share function
- Capacitor/fan life cycle management function
- Smart copier option (able to copy parameter and download drive main OS)
- IP66 with built-in mains isolator switch

### Model Number Identification



### General Specification

MDLV0000100G-100000		0004	0008	0015	0022	MDLV0000100G-200000		0004	0008	0015	0022	0037	0055	0075	0110	0150
Motor rating	Heavy Duty kW	0.4	0.75	1.5	2.2	0.4	0.75	1.5	2.2	3.7	5.5	7.5	11.0	15.0		
	Normal Duty kW	0.75	1.5	2.2	3.7	0.75	1.5	2.2	3.7	4.0	7.5	11.0	15.0	18.5		
Output rating	Capacity Heavy Duty kVa	1.0	1.9	3.0	4.2	1.0	1.9	3.0	4.2	6.1	9.1	12.2	17.5	22.9		
	Capacity Normal Duty kVa	1.2	2.3	3.8	4.6	1.2	2.3	3.8	4.6	6.9	11.4	15.2	21.3	26.3		
	Rated Current Heavy Duty	2.5	5.0	8.0	11.0	2.5	5.0	8.0	11.0	16.0	24.0	32.0	46.0	60.0		
	Rated Current Normal Duty	3.1	6.0	9.6	12.0	3.1	6.0	9.6	12.0	18.0	30.0	40.0	56.0	69.0		
Input rating	Frequency Hz	0-400Hz (IM sensorless 0-120 Hz)					0-400Hz (IM sensorless 0-120 Hz)									
	Voltage	3-phase 200-240V					3-phase 200-240V									
	Voltage	1-phase 200-240V AC (-15% - +10%)					3-phase 200-240V AC (-15% to +10%)									
	Frequency Hz	50-60Hz (±5%)					50-60Hz (±5%)									
Weight kg	Rated Heavy Duty	4.4	9.3	15.6	21.7	2.2	4.9	8.4	11.8	17.5	25.8	34.9	50.8	66.7		
	Current (A) Normal Duty	5.8	11.7	19.7	24.0	3.0	6.3	10.8	13.1	19.4	32.7	44.2	62.3	77.2		
Weight kg		0.9	1.3	1.5	2.0	0.9	0.9	1.3	1.5	2.0	3.3	3.3	4.6	7.1		
	inc. Built-in EMC	1.14	1.76	1.76	2.22	-	-	-	-	-	-	-	-	-		

MDLV0000100G-400000		0004	0008	0015	0022	0037	0055	0075	0110	0150	0185	0220	0300	0370	0450	0550	0750
Motor rating	Heavy Duty kW	0.4	0.75	1.5	2.2	3.7	5.5	7.5	11.0	15.0	18.5	22.0	30.0	37.0	45.0	55.0	75.0
	Normal Duty kW	0.75	1.5	2.2	3.7	4.0	7.5	11.0	15.0	18.5	22.0	30.0	37.0	45.0	55.0	75.0	90.0
Output rating	Capacity Heavy Duty kVa	1.0	1.9	3.0	4.2	6.1	9.1	12.2	18.3	22.9	29.7	34.3	46.5	57.2	69.4	83.8	115.8
	Capacity Normal Duty kVa	1.5	2.4	3.9	5.3	7.6	12.2	17.5	22.9	29.0	33.5	44.2	57.2	69.4	81.5	108.2	128.8
	Rated Current Heavy Duty	1.3	2.5	4.0	5.5	8.0	12.0	16.0	24.0	30.0	39.0	45.0	61.0	75.0	91.0	110.0	152.0
	Rated Current Normal Duty	2.0	3.1	5.1	6.9	10.0	16.0	23.0	30.0	38.0	44.0	58.0	75.0	91.0	107.0	142.0	169.0
Input rating	Frequency Hz	0-400Hz (IM sensorless 0-120 Hz)															
	Voltage	3-phase 380-480V															
	Voltage	3-phase 380-480V AC (-15% to +10%)															
	Frequency Hz	50-60Hz (±5%)															
Weight kg	Rated Heavy Duty	1.1	2.4	4.2	5.9	8.7	12.9	17.5	26.5	33.4	43.6	50.7	56.0	69.0	85.0	103.0	143.0
	Current (A) Normal Duty	2.0	3.3	5.5	7.5	10.8	17.5	25.4	33.4	42.5	49.5	65.7	69.0	85.0	100.0	134.0	160.0
Weight kg		0.9	1.9	1.3	1.5	2.0	3.3	3.4	4.6	4.8	7.5	7.5	25.8	34.4	34.4	41.8	43.8
	inc. Built-in EMC	1.18	1.18	1.77	1.80	2.23	-	-	-	-	-	-	-	-	-	-	-

Control specifications	Control method	V/f, Slip compensation, Sensorless vector
	Speed reference resolution	Digital command: 0.01Hz, Analog command: 0.06Hz (maximum frequency: 60Hz)
	Frequency accuracy	1% of the maximum output frequency
	V/f curve	Linear, Squared, User V/f
	Overload capacity	Heavy Duty: 150% 1 minute, Normal Duty: 120% 1 minute
Operation	Torque boost	Manual, Automatic torque boost
	Keypad display	4 digit, 7 segment LED keypad
	Operation method	Keypad, Terminal, Communication option selectable
	Frequency setting	Analog: -10 to 10V, 0 to 10V, 420mA Digital: Keypad, Pulse train input
Input signal	Operation function	PID, Up-Down, 3-Wire, DC braking, Frequency limit, Frequency jump, 2nd function, Slip compensation, Anti reverse, Automatic restart, Commercial power change, Auto-tuning, Flying start, Energy buffering operation, Power braking, Flux braking, Leakage reduction operation
	Multi-function terminal	NPN (Sink), PNP (Source) selectable
	Standard I/O (5 points)	Function: Forward run, Reverse run, Reset, External trip, Emergency stop, Jog operation, Multi-step frequency-high, middle, low, Multi-step acceleration / deceleration-high, middle, low
	Multiple I/O (7 points)	DC braking at stop, 2nd motor select, Frequency up/down, 3-Wire operation, Change into normal operation during PID operation, Change into main body operation during option operation, Analog command frequency fixing, Acceleration / deceleration stop etc. selectable
Output signal	Pulse train	0 to 32 Hz, Low level: 0 to 0.8V, High level: 3.5 to 12V
	Open collector terminal	Fault output and drive operation status output
	Multi-function relay	(N.O., N.C.) less than AC 250V 1A, less than DC 30V 1A
	Analog output	0 to 10Vdc (4 to 20mA): Frequency, Output current, Output voltage, DC stage voltage etc. selectable
Protection	Pulse train	Maximum 32kHz, 10 to 12V
	Drive trip	Overcurrent, Overvoltage, Undervoltage, External trip, Ground fault current detection, Drive overheat, Motor overheat, Input-Output phase open, Overload protection, Light load protection, Communication error, Frequency command loss, Hardware fault, Cooling fan fault, Pre-PID motion failure, No motor trip, External brake trip, Option fault, Safety contact fault, Drive temperature sensor fault, Parameter write error, IO board fault
Enclosure	Drive alarm	Stall prevention, Overload, Light load, Cooling fan fault, Frequency command loss, DB duty cycle, Rotor time constant tuning fault, Capacitor, Fan life time up
		IP20, UL Type 1, IP66
Options	Keypad	Graphic LCD keypad (MDHP)
	Communication	Profibus-DP, EtherNet-IP, Modbus-TCP, CANopen



# MD100P

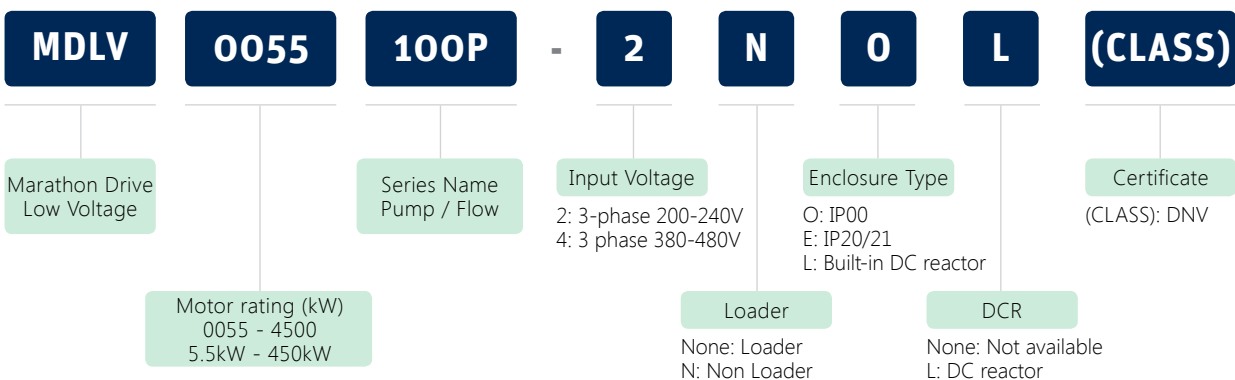
## Pump / Flow Specialised Variable Speed Drive

3 phase 200V: 5.5 - 30kW, 200-240V  
 3 phase 400V: 5.5 - 450kW, 380-480V



- Specialised function for Fan & Pump:
  - Advanced PID control (Pre-PID, Dual PID)
  - Multi motor control function (up to 4 motor: 5.5-90kW)
- Energy saving & high efficiency:
  - Sleep & wake-up function
  - Flying starting function
  - Automatic energy saving function
  - Flux braking algorithm
- Improved protection functions:
  - Pre-heater function
  - Low leakage PWM
  - Safety stop function
  - Automatic carrier frequency change
- Selectable V/f, sensorless vector control
- Easy start function
- Selectable PNP / NPN input signal
- Plug-in type control terminals
- Cooling fan on/off control
- Built-in RS485 (LS Bus) communication
- Communication boards (optional):
  - Modbus RTU, DeviceNet, Profibus-DP, LonWorks, BACnet, Modbus TCP, CANopen, CC-Link
- Monitoring & commissioning PC based software tool (drive view)
- DNV certification
- Long-life condenser & simple framework

### Model Number Identification



## General Specification

MDLV0000100P-2000		0055	0075	0110	0150	0185	0220	0300
Motor rating (Fan/Pump)	kW	5.5	7.5	11	15	18.5	22	30
	Current A	24	32	46	60	74	88	115
	(110% overload)	Normal duty: 110% for 1 minute						
Motor rating (General Load)	kW	3.7	5.5	7.5	11	15	18.5	22
	Current A	17	23	33	44	54	68	84
	(150% overload)	Heavy duty: 150% for 1 minute						
Output rating	kVa	9.1	12.2	17.5	22.9	28.2	33.5	43.8
	Voltage	3-phase 200 - 240V						
	Frequency Hz	0.01 - 120Hz						
Input rating	Voltage	3-phase 200 - 240V (-15% - +10%)						
	Frequency Hz	50 - 60Hz (±5%)						
Weight kg	Non DCR type	4.9	6	6	13	13.5	20	20

MD0000100P-4000		0055	0075	0110	0150	0185	0220	0300	0370	0450	0550	0750	0900	1100	1320	1600	2200	2800	3150	3750	4500	
Motor rating (Fan/Pump)	kW	5.5	7.5	11	15	18.5	22	30	37	45	55	75	90	110	132	160	220	280	315	375	450	
	Current A	12	16	24	30	39	45	61	75	91	110	152	183	223	264	325	432	547	613	731	877	
	(110% overload)	Normal duty: 110% for 1 minute																				
Motor rating (General Load)	kW	3.7	5.5	7.5	11	15	18.5	22	30	37	45	55	75	90	110	132	160	220	280	315	375	
	Current (Non DCR/DCR) A	8.8	12	16	22/24	28/30	34/39	44/45	61	75	91	110	152	183	223	264	325	432	547	613	731	
	(150% overload)	Heavy duty: 150% for 1 minute																				
Output rating	kVa	9.6	12.7	19.1	23.9	31.1	35.9	48.6	59.8	72.5	87.6	121.1	145.8	178	210	259	344	436	488	582	699	
	Voltage	3-phase 380 - 480V																				
	Frequency Hz	0.01 - 120Hz																				
Input rating	Voltage	3-phase 380 - 480V (-15% - +10%)																				
	Frequency Hz	50 - 60Hz (±5%)																				
Weight kg	Non DCR type	4.9	6	6	12.5	13	20	20	27	27	29	42	43	-	-	-	-	-	243	280	380	
	Built-in DCR type	-	-	-	19.5	19.5	26.5	26.5	39	40	42	67	68	101	101	114	200	200	-	-	-	

Control specifications	Control method	V/f slip compensation, sensorless vector
	Speed reference resolution	Digital command: 0.01Hz (below 100Hz), 0.1Hz (over 100Hz), Analog reference: 0.1Hz / 60Hz
	Frequency accuracy	Digital command: 0.01% of max output frequency, Analog signal command of 0.1% of max. output frequency
	V/f curve	Linear, Squared, User custom V/f
	Overload capacity	110% for 1 minute, 120% for 1 minute (based on ambient 25°C)
Operation	Torque boost	Auto & manual (0 to 15%) torque boost
	Keypad display	32 characters LCD keypad
	Operation method	Keypad, Terminal, Communication
	Frequency setting	Analog: 0 to 12V, 12V to 12V, 4 to 20mA or 0 to 20Ma, Pulse, Ext - PID, Digital: keypad
Input signal	Operation function	DC braking, Frequency limit, Frequency jump, Second function, Slip compensation, Reverse rotation prevention, Auto restart, Drive by-pass, Auto-tuning, PID control, Flying start, Safety stop, Flux braking, Low leakage, Pre-PID, Dul-PID, MMC, Easy start, Pre-heater
	Start signal	Forward / reverse
	Multi-step	Up to 8 speeds can be set including JOB (use programmable digital input terminal)
	Multi-step Accel/Decel time	0.1 to 6,000 sec, up to 4 types can be set (use multi-function terminal), Accel / decel curve: linear, U curve, S curve
	Emergency stop	Interrupts the output from drive
	JOG	JOG operation
Output signal	Fault reset	Trip status is removed when protection function is active
	Operating status	Frequency detection level, Overload alarm, Stalling, Over voltage, Low voltage, Drive overheating, Run, Stop, Constant speed, Drive-by-pass, Speed search
	Fault output	Contact output (3A, 3C, 3B) - AC 250V 1A, DC 30V 1A
Protection	Indicator	Output frequency, Output current, Output voltage, DC link voltage (output voltage 0 to 10V)
	Drive trip	Over voltage, Low voltage, Over current 1, 2, Ground fault, Drive overheating, Electronic thermal, Output phase open, Overload, External fault A,B, Communication error, Frequency command loss, Hardware fault, Option fault
Enclosure	Drive alarm	Stall prevention, Overload, Temperature sensor fault
		IP20/UL type 1 (5.5 to 11kW), IP00/UL open type (15 to 450kW)
Option	Board, cable, keypad	LCD keypad, Remote cable (2M/3M/5M), Sub-E board (current output)
	Communication	DeviceNet, Profibus-DP, Modbus TCP, Modbus RTU, Matasys N2, LonWorks, BACnet, CC-Link, CANopen



# MD100H

## HVAC Specialised Variable Speed Drive

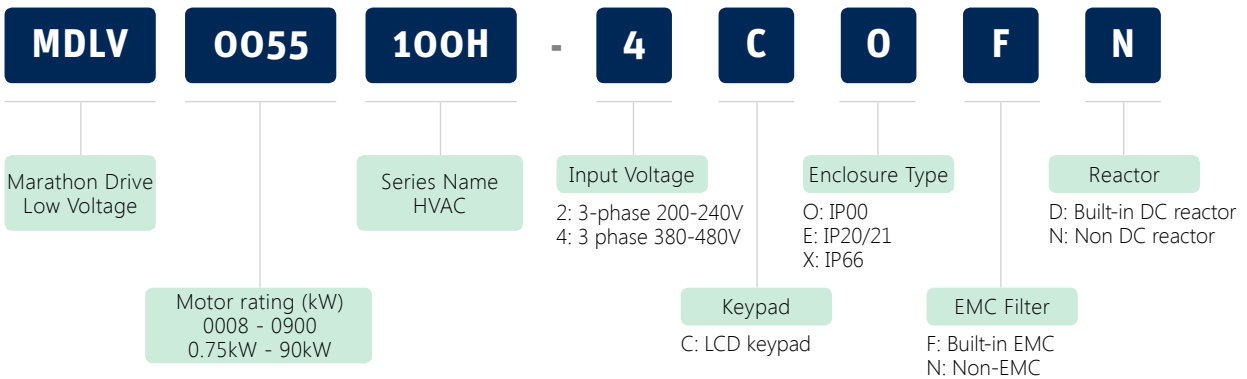
3 phase 0.75 - 18.5kW, 200-240V

3 phase 0.75 - 90kW, 380-480V



- Specialised function for HVAC
  - Multi-motor control
  - Scheduling function (Time event: Real Time Clock)
  - Flow compensation
  - Soft fill operation
  - Start ramp & End ramp
  - Dec valve ramp
  - Pump clean
  - Load tuning
  - Fire mode
  - Energy-saving display (payback counter)
  - Boost, wake-up function
- V/f control
- Built-in BACnet communication
- LonWorks (option)
- Keypad exclusive for HVAC
- Built-in EMC filter/DC Reactor
- Side by side installation
- Heatsink out the back installation (flange option)
- Enhanced size competitiveness
- Capacitor/fan life cycle management function
- Smart copier option (able to copy parameter and download drive main OS)

### Model Number Identification





## General Specification

MDLV□□□□100H-2□□□□		0008	0015	0022	0037	0055	0075	0110	0150	0185
Applied motor	kW	0.75	1.5	2.2	3.7	5.5	7.5	11.0	15.0	18.5
Rated output	Rated capacity kVa	1.9	3.0	4.5	6.1	8.4	11.4	16.0	21.3	26.3
	Rated current	5.0	8.0	12.0	16.0	22.0	30.0	42.0	56.0	69.0
	Output frequency A	0 - 400Hz								
Rated input	Output voltage	3-phase 200-240V								
	Service voltage	3-phase 200-240V AC (-15% to +10%)								
	Input frequency	50 - 60Hz (±5%)								
Weight kg	Rated current A	4.9	8.4	12.9	17.5	23.7	32.7	46.4	62.3	77.2
		3.3	3.3	3.3	3.3	3.3	3.3	3.3	4.6	7.1

MDLV□□□□100H-4□□□□		0008	0015	0022	0037	0055	0075	0110	0150	0185	0220	0300	0370	0450	0550	0750	0900
Applied motor	kW	0.75	1.5	2.2	3.7	5.5	7.5	11.0	15.0	18.5	22.0	30.0	37.0	45.0	55.0	75.0	90.0
Rated output	Rated capacity kVa	1.9	3.0	4.5	6.1	9.1	12.2	18.3	23.0	29.0	34.3	46.5	57.1	69.4	82.0	108.2	128.8
	Rated current	2.5	4.0	6.0	8.0	12.0	16.0	24.0	30.0	38.0	45.0	61.0	75.0	91.0	107.0	142.0	169.0
	Output frequency A	0 - 400Hz															
Rated input	Output voltage	3-phase 380-480V															
	Service voltage	3-phase 380-480V AC (-15% to +10%)															
	Input frequency	50 - 60Hz (±5%)															
Weight kg	Rated current A	2.4	4.2	6.5	8.7	12.2	17.5	26.5	33.4	42.5	50.7	69.1	69.3	84.6	100.1	133.6	160.0
		3.3	3.3	3.3	3.3	3.3	3.3	3.4	4.6	4.8	7.5	7.5	26.0	35.0	35.0	43.0	43.0

Control specifications	Control method	V/f control, slip compensation
	Frequency set resolution	Digital command: 0.01Hz, Analog command: 0.06Hz (based on 60Hz)
	Control degree of frequency	1% of the maximum output frequency
	V/f curve	Liner, squared overload reduction and user V/f
	Overload capacity	Rated current: 120% 1 minute
Operation	Torque boost	Manual torque boost, automatic torque boost 1, automatic torque boost 2
	Operation method	Optional: Keypad, terminal board or communication control
	Frequency setting	Analog mode: -10 to 10V, 0 to 10V, 0 to 20mA, Digital mode: Keypad and pulse train input
Input signal	Operation function	PID control, 3-Wire control, Frequency limitation, Secondary functions, Forward/Reverse rotation prohibited, DC braking, Commercial power switching, Speed search, Power braking, Reduction of leadage, Up-Down control, DC braking Flux braking, Frequency pump, Slip compensation, Automatic, restart, Automatic tuning, Energy buffering control, Energy saving control
	Multifunctional	Forward operation, Reset, Emergency stop, Multi-step frequency - High / Mid / Low, DC braking during stop, Pre-Heat, Frequency increase, 3-Wire, Optional: Acceleration, Terminal (7 points) deceleration or stop, MMC interlock, Reverse operation, Pump cleaning, External trip, Job control, Multi-step acceleration/deceleration - High / Mid / Low, Secondary motor selection, RTC (Time event function), Frequency decrease, Analog command frequency fixation, Switching to normal operation during PID operation
Output signal	Pulse train	0 to 3kHz, Low level: 0 to 0.8V, High level: 3.5 to 12V
	Multifunctional open	DC 26V, 50mA or below
	Collector terminal	N.O.: AC 250V, 5A or below, DC 3 0V, 3A or below
	Failure (fault) relay terminal	N.C.: AC 250V, 1A or below, DC 30V, 1A or below
Protection	Multifunctional relay terminal	AC 250V, 5A or below, DC 30V, 5A or below
	Trip	Over-current trip, Trip caused by external signals, ARM short-circuit current trip, Overheat trip, Pipe broken trip, Input open-phase trip, Ground trip, Motor overheat trip, IO board connection trip, No motor trip, Parameter write trip, Emergency stop trip, Command loss trip, External memory error, CPU watchdog trip, Motor under-load trip, Overvoltage trip, Temperature sensor trip, Drive overheat, Option trip, Output open-phase trip, Drive overload trip, Fan trip, Low voltage trip during operation, Low voltage trip, Analog input error, Motor overload trip, Keypad command loss trip, Damper trip, Level detect trip, All auxiliary motor failure trip, Pump clean failure (fault)
	Warning	Command loss trip warning, overload warning, under-load warning, driver overload warning, fan operation warning, damping resistance brake percentage warning, capacitor life warning, pump clean warning, fire more warning and LDT warning
	Instant power	Below 8 ms: Continuous operation (within the rated input voltage and rated output)
Enclosure	Interruption	8 ms or above: Automatic restart operation
		IP20/UL Open (default), UL Enclosed Type 1 (option)
Option	Board	Extension I/O (available soon)
	Communication	Lonworks
Others		Built-in BACnet, Modbus-RTU (RS485), Metasys N2



# MDHP

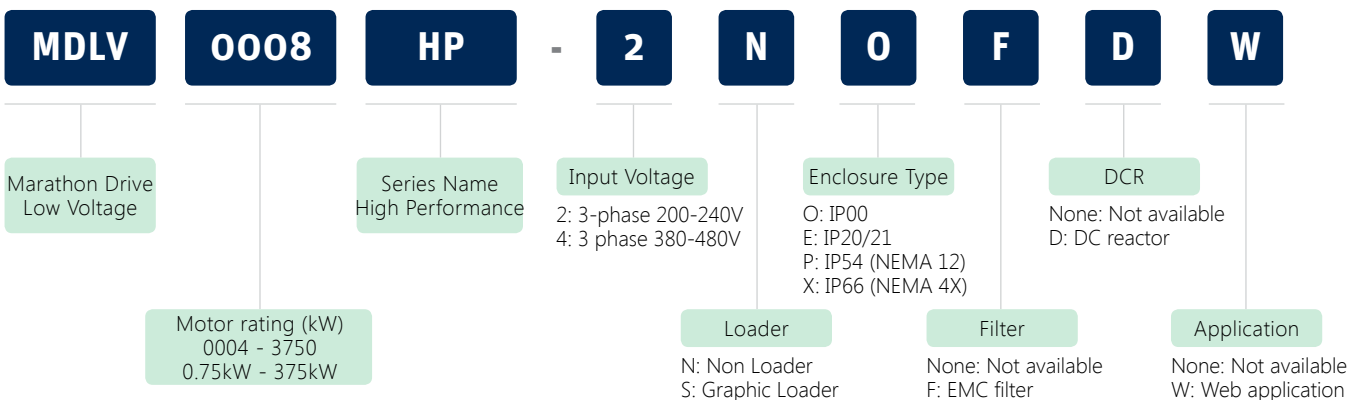
## High Performance Variable Speed Drive

3 phase 0.75 - 75kW, 200-240V  
3 phase 0.75 - 375kW, 380-480V



- Constant torque / variable torque dual rating
- Selectable V/f, V/f PG, sensorless vector, sensed vector
- 150 MIPS (million instructions per second) high speed DSP
- High performance & functions:
  - Droop control (automatic torque balance)
  - KEB (Kinetic energy buffering) protection
  - Ride through (LV trip delay) protection
  - Under load trip protection
  - PMSM sensorless vector function
  - Power brake & flux brake function
  - Static motor parameter auto-tuning
- Easy to control: Easy start mode, user & macro group, multi function key
- 2nd motor sensorless control and parameter setting
- Available IP54 enclosure (0.75-22kW) as built-in option
- Built-in RS485 (LS Bus / Modbus RTU) communication
- Built-in dynamic braking transistor (0.75-22kW)
- Available EMC filter & DC reactor as built-in option, EMC filter (0.75-22kw) / DC reactor (0.75-160kW)
- Wide graphic LCD keypad (6 different languages)
- PLC board (optional): Master-K platform: 14 max. inputs & 7 max. outputs
- Extension I/O boards (optional): 11 max. inputs & 6 max. outputs
- Communication boards (optional): Profibus-DP, DeviceNet, Modbus TCP, Rnet, LonWorks, CANopen
- Monitoring & commissioning PC based software tool (drive view)

### Model Number Identification



## General Specification

MD0000HP-200000		0008	0015	0022	0037	0055	0075	0110	0150	0185	0220	0300	0370	0450	0550	0750
Motor rating	kW	0.75	1.5	2.2	3.7	5.5	7.5	11	15	18.5	22	30	37	45	55	75
Output rating	Capacity kVa	1.9	3	4.5	6.1	9.1	12.2	17.5	22.9	28.5	33.5	46	57	69	84	116
	Current (CT) A	5	8	12	16	24	32	46	60	74	88	116	146	180	220	288
	Current (VT) A	8	12	16	24	32	46	60	74	88	124	146	180	220	288	345
	Voltage V	Three phase 200-240V														
	Frequency Hz	0.01-400Hz (Sensorless-1 control: 0.01-300Hz, Sensorless-2 or Sensored control: 0.01-120Hz)														
Input rating	Voltage V	Three phase 200-240V (-15% - +10%)														
	Frequency Hz	50 - 60Hz (±5%)														
	Current (CT) A	8.3	12.9	18.6	24	32.9	41.4	58	69	88	96	121	154	191	233	305
	Current (VT) A	7	10.6	14.8	21.8	28	42	52	60	75	107	152	190	231	302	326
Weight kg		5.5	5.5	5.5	5.5	10	10	20	20	30	30	29.5	44	44	72.5	72.5

MD0000HP-400000		0008	0015	0022	0037	0055	0075	0110	0150	0185	0220	0300	0370	0450	0550	0750	0900	1100	1320	1600	1850	2200	2800	3150	3750	
Motor rating	Heavy Duty kW	0.75	1.5	2.2	3.7	5.5	7.5	11	15	18.5	22	30	37	45	55	75	90	110	132	160	185	220	280	315	375	
Output rating	Capacity kVa	1.9	3	4.5	6.1	9.1	12.2	17.5	22.9	29.7	34.3	46	57	69	84	116	139	170	201	248	286	329	416	467	557	
	Current (CT) A	2.5	4	6	8	12	16	24	30	39	45	61	75	91	110	152	183	223	264	325	370	432	547	613	731	
	Current (VT) A	4	6	8	12	16	24	30	39	45	61	75	91	110	152	183	223	264	325	370	432	547	613	731	877	
	Voltage	Three phase 380-480V																								
	Frequency Hz	0.01-400Hz (Sensorless-1 control: 0.01-300Hz, Sensorless-2 or Sensored control: 0.01-120Hz)																								
Input rating	Voltage V	3-phase 380-480V (-15% - +10%)																								
	Frequency Hz	50 - 60Hz (±5%)																								
	Current (CT) A	4.3	7.2	10.6	15.4	21	25.8	39	44	57	57	69	83	113	154	195	239	286	362	404	466	605	674	798		
	Current (VT) A	3.5	5.3	7.3	10.8	13.8	22.5	26	33	40	52.2	90	109	123	162	195	237	282	350	403	463	590	673	796	948	
Weight kg		5.5	5.5	5.5	5.5	10	10	20	20	30	30	41	41	41	63	63	101	101	114	114	200	200	252	352	352	

Control specifications	Control method	V/f V/f PG, Slip compensation, Sensorless-1 vector, Sensorless-2 vector, Sensored vector
	Speed reference resolution	Digital command: 0.01Hz, Analog reference: 0.06Hz (max. frequency 60Hz)
	Frequency accuracy	Digital command: 0.01% of max. output frequency, Analog signal command of 0.1% of max. output frequency
	V/f curve	Linear, squared, user customer V/f
	Overload capacity	CT (heavy duty): 150% for 1 minute, VT (normal duty): 110% for 1 minute
Operation	Torque boost	Auto & manual torque boost
	Keypad display	Wide graphic LCD keypad (available 6 languages)
	Operation method	Keypad, Terminal, Communication
	Frequency setting	Analog: 0 to 10V, -10 to 10V, 0 to 20mA, Digital: keypad
Input signal	Operation function	PID control, Up-Down operation, 3-Wire operation, DC braking, Frequency limit, Second function, Slip compensation, Reverse rotation prevention, Auto restart, Drive by-pass, Auto-tuning, Flying start, Energy buffering, Power braking, Flux braking, Low leakage, MMC, Easy start
	Multi-function terminal (P1 to P8)	PNP / NPN selectable 8 points (programmable)
	Multi-function relay	(N.O., N.C.) less than AC 250V, 1A, Less than DC 30V 1A, Fault output & drive status output
Output signal	Multi-function open collector	DC 24V (less than 50mA)
	Analog output	0 to 10Vdc (less than 10mA): Frequency, Current, Voltage, DC voltage selectable
Protection	Drive trip	Over current, Over voltage, Low current, External trip, Ground fault, Drive overheat, I/O phase open, Overload, Communication error, Frequency command lost, Hardware fault, Fan fault, Pre-PID fault, No motor trip, External brake trip
	Drive alarm	Stall prevention, Overload, Light load, Encoder connection error, Keypad command loss, Speed command loss
Enclosure		IP00 (30 to 75kW, 200V / 90 to 375kW, 400V), IP21 (0.75-22kW, 200V / 0.75 to 75kW, 400V), IP54 / NEMA12 (0.75kW to 22kW, 200V/400V)
Option	Board, cable, keypad	Graphic LCD keypad (IP21), Extension I/O, Isolation I/O, Encoder board, PLC board, Remote cable (2M/3M)
	Communication	Profibus-DP, DeviceNet, Modbus TCP, Rnet, LonWorks, CANopen, EtherNet/IP
Others		Built-in dynamic braking transistor (0.75kW to 22kW, built-in RS485 (LS Bus / Modbus RTU)



# MD100C

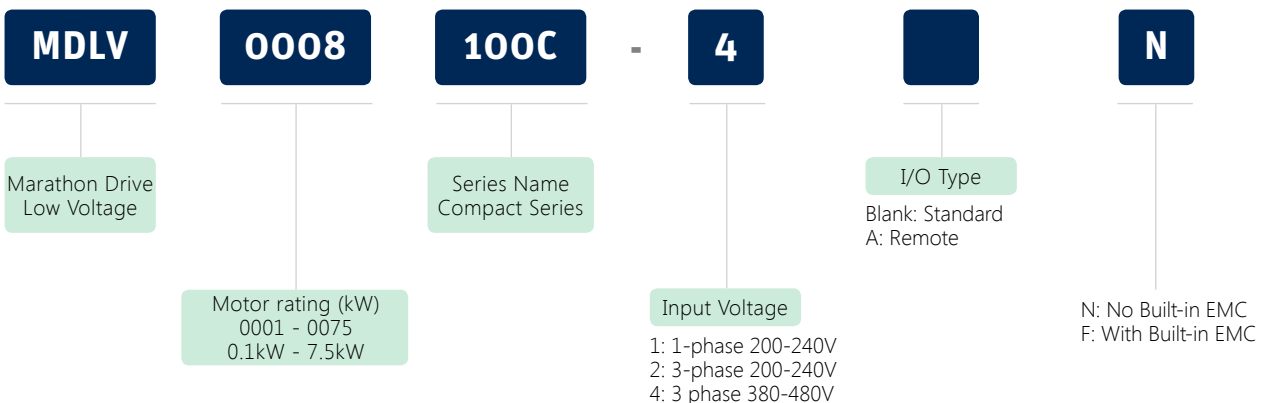
## Compact Series Variable Speed Drive

- 1 phase 0.1 - 2.2kW, 200-240V
- 3 phase 0.1 - 3.7kW, 200-240V
- 3 phase 0.4 - 7.5kW, 380-480V



- Sensorless vector & V/Hz control
- Easy fan maintenance
- Built-in Modbus RTU
- Built-in Rotary Potentiometer
  - Selectable PNP/NPN digital inputs
  - DC injection braking
- Built-in EMC filter
- HD operation: 10-50°C
- IP20 compact design
  - Available from 0.1 - 2.2kw single phase
  - Available from 0.4 - 7.5kW three phase
- CE & C-Tick approval
- Ideal for OEM's and can fit anywhere
- Rated for constant torque

### Model Number Identification



## General Specification

MDLV□□□□100C-1□□		0001	0002	0004	0008	0015	0022
Applicable motor kW		0.1	0.2	0.4	0.75	1.5	2.2
		0.3	0.5	1.0	1.9	3.0	4.2
Output rating	Rated capacity kVa	0.3	0.5	1.0	1.9	3.0	4.2
	Rating current A	0.8	1.4	2.5	5.0	8.0	11
	Max. output frequency	400Hz					
	Max. output voltage	3-phase 200-240V					
Input rating	Rated voltage	1-phase 200-240 V AC (-15% - +10%)					
	Rated frequency	50 - 60Hz (±5%)					
Cooling type		Natural			Forced		
Weight kg		0.55	0.55	0.8	1.22	1.42	1.97

MDLV□□□□100C-2□□		0001	0002	0004	0008	0015	0022	0037	0055	0075	
Applicable motor	HD kW	0.1	0.2	0.4	0.75	1.5	2.2	3.7	5.5	7.5	
	ND kW	0.2	0.4	0.75	1.1	2.2	3.0	4.0	7.5	11.0	
Output ratings	Rated capacity HD kW	0.3	0.5	1.0	1.9	3.0	4.2	6.1	9.1	12.2	
	Rated capacity ND kW	0.4	0.7	1.3	2.4	3.8	5.2	7.6	12.1	16.3	
	Rated capacity HD A	0.8	1.4	2.5	5.0	8.0	11.0	16.0	24.0	32.0	
	Rated capacity ND A	1.1	1.8	3.1	6.3	10.0	12.0	18.0	30.0	40.0	
	Max. output frequency	400Hz									
	Max. output voltage	3-phase 200-240V									
Input ratings	Rated voltage	3-phase 200-240V AC (-15% - +10%)									
	Rated frequency	50 - 60Hz (±5%)									
Cooling type		Natural				Forced					
Weight kg		0.55	0.55	0.8	0.8	1.22	1.42	1.97	3.3	3.3	

MDLV□□□□100C-4□□		0004	0008	0015	0022	0037	0055	0075	
Applicable motor	HD kW	0.4	0.75	1.5	2.2	3.7	5.5	7.5	
	ND kW	0.75	1.1	2.2	3.0	4.0	7.5	11.0	
Output ratings	Rated capacity HD kW	1.0	1.9	3.0	4.2	6.1	9.1	12.2	
	Rated capacity ND kW	1.2	2.4	3.8	5.2	7.6	12.1	16.3	
	Rated capacity HD A	1.25	2.5	4.0	5.5	8.0	12.0	16.0	
	Rated capacity ND A	2.0	3.1	5.1	6.9	10.0	16.0	23.0	
	Max. output frequency	400Hz							
	Max. output voltage	3-phase 380-480V							
Input ratings	Rated voltage	3-phase 380-480V AC (-15% - +10%)							
	Rated frequency	50 - 60Hz (±5%)							
Cooling type		Natural	Forced						
Weight kg		0.8	0.8	1.22	1.42	1.97	3.3	3.4	

Control type	V/f control, sensorless vector control	
Frequency Precision Setting	Digital command: 0.01Hz Analog command: 0.03Hz (max. frequency: 60Hz)	
Frequency Precision	Operation by digital command: 0.01% of max. output frequency. Analog command operation: 0.1% of max. output frequency.	
V/f Pattern	Linear, squared, user V/f	
Overload capacity	HD: 150%/1min; ND: 100%/1min	
compensation	Manual/auto torque compensation	
Dynamic Torque 20% Braking	Max. Brake Torque	20% (average braking torque during decel to stop of a motor)
	Time/%ED	150% when using optional DB resistor (refer to user manual for DB resistor specification)
Operation mode	Keypad, Terminal, Communication operation	
Frequency setting	Analog type: 0 to 10V, 0 to 20mA	
	Digital type: keypad	
	Panel potentiometer	
Operational functions	PID control, Up-Down operation, 3 wiring operation	
Input	Optional NPN / PNP	
	Functions: Forward/Reverse operation, Emergency stop, Fault reset, Jog operation, Multi-step frequency - High, Mid and Low, Multi-step Accel/Decel - High, Mid, Low, DC braking at stop, 2 <sup>nd</sup> motor select, Up/Down operation function (Increase/Decrease of frequency), 3-wire operation, External fault signal input (contact A/B), General operation switched during PIO operation, 2 <sup>nd</sup> Source, Analog hold, Accel/Decel stop, Up/Down Save Freq, Jog forwards/reverse operation	
Output	Multi-function relay	Fault output and drive status option Less than (N.O., N.C.) AC 250V 1A, Less than DC 30V 1A
	Analog output	0 to 10Vdc (less than 10mA): Choose among Output Freq, Output Current, Output Voltage, DC link selectable.

MD100G

SET      LSIS      FWD  
RUN      60.00      REV

RUN    ▲    STOP/RESET    ESC  
◀    ▼    ▶    ENT



**Risk of Injury or Electric Shock.**  
Read the manual and follow the safety instructions before use.  
**Risk of Electric Shock.**  
Before opening the cover, disconnect at power and wait at least 10 minutes.  
**Risk of Electric Shock.**  
Securely ground to the inverter.

MD100G

SET      FWD      FWD  
RUN      60.00      REV

RUN    ▲    STOP/RESET    ESC  
◀    ▼    ▶    ENT



**WARNING**  
Risk of Injury or Electric Shock.  
Read the manual and follow the safety instructions before use.  
**Risk of Electric Shock.**  
Before opening the cover, disconnect at power and wait at least 10 minutes.  
**Risk of Electric Shock.**  
Securely ground to the inverter.

marathon  
Drives

MD100G

SET      FWD      FWD  
RUN      60.00      REV

RUN    ▲    STOP/RESET    ESC  
◀    ▼    ▶    ENT



marathon  
Drives



# marathon™ Drives

*Simplicity, Precision, Flexibility, Standardisation,  
Easy to Use, Diversity... these are all inherent  
qualities of Marathon Variable Speed Drives.*





Selection & Rating Tables

MD100G, IP20

	Part Number	Heavy Duty 150% for 60 secs		Normal Duty 120% for 60 secs		Built-in Keypad Type
		kW	Amps	kW	Amps	
Single Phase 200 - 240V AC (-15% - +10%)	MDLV0004100G-1EOFNS	0.4	2.5	0.75	3.1	LED (7-Segment)
	MDLV0008100G-1EOFNS	0.75	5	1.5	6	
	MDLV0015100G-1EOFNS	1.5	8	2.2	10	
	MDLV0022100G-1EOFNS	2.2	11	3.7	12	
Three Phase 380 - 480V AC (-15% - +10%)	MDLV0004100G-4EOFNS	0.4	1.3	0.75	2.0	LED (7-Segment)
	MDLV0008100G-4EOFNS	0.75	2.5	1.5	3.1	
	MDLV0015100G-4EOFNS	1.5	4	2.2	5.1	
	MDLV0022100G-4EOFNS	2.2	5.5	3.7	6.9	
	MDLV0037100G-4EOFNS	3.7	8	4.0	10.0	
	MDLV0040100G-4EOFNS	4.0	9	5.5	10	
	MDLV0055100G-4EOFNS	5.5	12	7.5	16	
	MDLV0075100G-4EOFNS	7.5	16	11.0	23	
	MDLV0110100G-4EOFNS	11.0	24	15.0	30	
	MDLV0150100G-4EOFNS	15.0	30	18.5	38	
	MDLV0185100G-4EOFNS	18.5	39	22.0	44	
	MDLV0220100G-4EOFNS	22.0	45	30.0	58	
	MDLV0300100G-4COFDS	30.0	61	37.0	75	LCD
	MDLV0370100G-4COFDS	37.0	75	45.0	91	
	MDLV0450100G-4COFDS	45.0	91	55.0	107	
	MDLV0550100G-4CONDS	55.0	110	75.0	142	
	MDLV0750100S-4CONDS	75.0	152.0	90.0	169	

MD100G, IP66

	Part Number	Heavy Duty 150% for 60 secs		Built-in Keypad Type
		kW	Amps	
Single Phase 200 - 240V AC (-15% - +10%)	MDLV0004100G-2EXNNS,IP66	0.4	2.5	LED (7-Segment)
	MDLV0008100G-2EXNNS,IP66	0.75	5	
	MDLV0015100G-2EXNNS,IP66	1.5	8	
	MDLV0022100G-2EXNNS,IP66	2.2	11	
	MDLV0037100G-2EXNNS,IP66	3.7	16	
	MDLV0055100G-2EXNNS,IP66	5.5	24	
	MDLV0075100G-2EXNNS,IP66	7.5	32	
	MDLV0110100G-2EXNNS,IP66	11.0	46	
	MDLV0150100G-2EXNNS,IP66	15.0	60	
Three Phase 380 - 480V AC (-15% - +10%)	MDLV0004100G-4EXFNS,IP66	0.4	1.3	LED (7-Segment)
	MDLV0008100G-4EXFNS,IP66	0.75	2.5	
	MDLV0015100G-4EXFNS,IP66	1.5	4	
	MDLV0022100G-4EXFNS,IP66	2.2	5.5	
	MDLV0037100G-4EXFNS,IP66	3.7	8	
	MDLV0055100G-4EXFNS,IP66	5.5	12	
	MDLV0075100G-4EXFNS,IP66	7.5	16	
	MDLV0110100G-4EXFNS,IP66	11.0	24	
	MDLV0150100G-4EXFNS,IP66	15.0	30	
	MDLV0185100G-4EXFNS,IP66	18.5	39	
MDLV0220100G-4EXFNS,IP66	22.0	45		



### Selection & Rating Tables

#### MD100P

	Part Number	Normal Duty 110% for 60 secs		Built-in Keypad Type
		kW	Amps	
Three Phase 380 - 480V AC (-15% - +10%)	MDLV0055100P-4NE	5.5	12	No
	MDLV0075100P-4NE	7.5	16	
	MDLV0110100P-4NE	11	24	
	MDLV0150100P-4OL	15	30	
	MDLV0185100P-4OL	18.5	39	
	MDLV0220100P-4OL	22	45	
	MDLV0300100P-4OL	30	61	
	MDLV0370100P-4OL	37	75	
	MDLV0450100P-4OL	45	91	YES
	MDLV0550100P-4OL	55	110	
	MDLV0750100P-4OL	75	152	
	MDLV0900100P-4OL	90	183	
	MDLV1100100P-4OL	110	223	
	MDLV1320100P-4OL	132	264	
	MDLV1600100P-4OL	160	325	
	MDLV2200100P-4OL	220	432	
	MDLV2800100P-4OL	280	547	
	MDLV3150100P-4O	315	613	
	MDLV3750100P-4O	375	731	
	MDLV4500100P-4O	450	877	

#### MD100H - IP20

	Part Number	Normal Duty 110% for 60 secs		Built-in Keypad Type
		kW	Amps	
Three Phase 380 - 480V AC (-15% - +10%)	MDLV0008100H-4COFN	0.75	2.5	LCD
	MDLV0015100H-4COFN	1.5	4.0	
	MDLV0022100H-4COFN	2.2	6.0	
	MDLV0037100H-4COFN	3.7	8.0	
	MDLV0055100H-4COFN	5.5	12	
	MDLV0075100H-4COFN	7.5	16	
	MDLV0110100H-4COFN	11.0	24	
	MDLV0150100H-4COFN	15.0	30	
	MDLV0185100H-4COFN	18.5	38	
	MDLV0220100H-4COFN	22	45	
	MDLV0300100H-4COFN	30	61	
	MDLV0370100H-4COFD	37	75	
	MDLV0450100H-4COFD	45	91	
	MDLV0550100H-4COFD	55	107	
	MDLV0750100H-4COND	75	142	
	MDLV0900100H-4COND	90	169	



Selection & Rating Tables

MDHP NEMA1 / IP20

Part Number	Heavy Duty 150% for 60 secs		Normal Duty 110% for 60 secs		DC Reactor Built-in	Keypad Built-in	EMC Filter Built-in
	kW	Amps	kW	Amps			
Three Phase 380 - 480V AC (-15% - +10%)	MDLV0008HP-4NOFD	0.75	2.5	1.5	4	Yes	Yes
	MDLV0015HP-4NOFD	1.5	4	2.2	6		
	MDLV0022HP-4NOFD	2.2	6	3.7	8		
	MDLV0037HP-4NOFD	3.7	8	5.5	12		
	MDLV0055HP-4NOFD	5.5	12	7.5	16		
	MDLV0075HP-4NOFD	7.5	16	11	24		
	MDLV0110HP-4NOFD	11	24	15	30		
	MDLV0150HP-4NOFD	15	30	18.5	39		
	MDLV0185HP-4NOFD	18.5	39	22	45		
	MDLV0220HP-4NOFD	22	45	30	61		
	MDLV0300HP-4NO	30	61	37	75	Yes	No
	MDLV0300HP-4NOD	30	61	37	75	No	
	MDLV0370HP-4NO	37	75	45	91	Yes	
	MDLV0370HP-4NOD	37	75	45	91	No	
	MDLV0450HP-4NO	45	91	55	110	Yes	
	MDLV0450HP-4NOD	45	91	55	110	No	
	MDLV0550HP-4NO	55	110	75	152	Yes	
	MDLV0550HP-4NOD	55	110	75	152	No	
	MDLV0750HP-4NO	75	152	90	183	Yes	
	MDLV0750HP-4NOD	75	152	90	183	No	

MDHP IP00

Part Number	Heavy Duty 150% for 60 secs		Normal Duty 110% for 60 secs		DC Reactor Built-in	Keypad Built-in	
	kW	Amps	kW	Amps			
Three Phase 380 - 480V AC (-15% - +10%)	MDLV0900HP-4SOD	90	183	110	223	Yes	Yes
	MDLV1100HP-4SOD	110	223	132	264.0		
	MDLV1320HP-4SOD	132	264	160	325		
	MDLV1600HP-4SOD	160	325	185	370.0		
	MDLV1850HP-4SOD	185	370	220	432		
	MDLV2200HP-4SOD	220	432	280	547.0		
	MDLV2800HP-4SO	280	547	315	613		
	MDLV3150HP-4SO	315	613	375	731.0	No	
	MDLV3750HP-4SO	375	731	450	877		

Note: If no kit listed, drive is IP00 and requires installation in a cabinet.

MDHP NEMA12 / IP54

Part Number	Heavy Duty 150% for 60 secs		Keypad Built-in	
	kW	Amps		
Three Phase 380 - 480V AC (-15% - +10%)	MDLV0008HP-4SP	0.75	2.5	Yes
	MDLV0015HP-4SP	1.5	4.0	
	MDLV0022HP-4SP	2.2	6	
	MDLV0037HP-4SP	3.7	8.0	
	MDLV0055HP-4SP	5.5	12	
	MDLV0075HP-4SP	7.5	16.0	
	MDLV0110HP-4SP	11	24	
	MDLV0150HP-4SP	15	30.0	
	MDLV0185HP-4SP	18.5	39	
	MDLV0220HP-4SP	22	45.0	

## Selection & Rating Tables

### MD100C

	Part Number	Heavy Duty 150% for 60 secs		Normal Duty 110% for 60 secs		Frame Size	Order Code
		kW	Amps	kW	Amps		
Single Phase 200 - 240V AC (-15% - +10%)	MDLV0001100C-1	0.1	0.8	-	-	1	66330007W1
	MDLV0002100C-1	0.2	1.4	-	-	1	66330008W1
	MDLV0004100C-1	0.4	2.5	-	-	2	66330009W1
	MDLV0008100C-1	0.8	5	-	-	3	66330010W1
	MDLV0015100C-1	1.5	8	-	-	4	66330011W1
	MDLV0022100C-1	2.2	11	-	-	5	66330012W1
Three Phase 380 - 480V AC (-15% - +10%)	MDLV0004100C-4	0.4	1.25	0.75	2.0	2	66310006W1
	MDLV0008100C-4	0.8	2.5	1.1	3.1	2	66310007W1
	MDLV0015100C-4	1.5	4	2.2	5.1	3	66310008W1
	MDLV0022100C-4	2.2	5.5	3.0	6.9	4	66310009W1
	MDLV0037100C-4	3.7	8	4.0	10.0	5	66310010W1
	MDLV0055100C-4	5.5	12	7.5	16.0	6	66310015W1
	MDLV0075100C-4	7.5	16	11.0	23.0	6	66310016W1

### Dimensions

Frame Size (mm)	H	W	D
1	6.9	12.7	9.4
2	6.9	12.7	12.7
3	9.9	12.7	13.0
4	9.9	12.7	14.5
5	14.0	12.7	14.5
6	16.0	12.7	14.2



Industry Applications

Industry	Application	MD100G	MD100P	MD100H	MDHP	MD100C
HVAC	Building Industry	■	■	■	■	
	Pumps & Fans	■	■	■	■	
	Compressors	■	■	■	■	
	Chillers	■	■	■	■	
	Irrigation	■	■	■	■	
Automation	Factory Automation	■			■	■
	Process Automation	■			■	■
	Automatic Production	■			■	■
	High Precision Systems	■			■	■
	Positioning Control System	■			■	■
	Lifts and Elevators	■			■	■
	Automatic Cranes Systems	■			■	■
	Automatic Guided Vehicles	■			■	■
	Packing Machines	■			■	■
Water	Irrigation	■	■			
	Farming	■	■			
	WTP & STP	■	■			
	Waste Water	■	■			
Mining	Conveyors	■			■	
	Drills	■			■	
	Drag Lines	■			■	
	Stacker / Reclaimer	■			■	
	Winders				■	
	Crushers	■			■	
	Crawlers	■			■	
	Slurry Pumps	■	■		■	
	Vibration Screens	■			■	
	Scrubbers				■	
	Washery	■	■		■	
Food & Beverage	Mixers	■			■	■
	Conveyors	■			■	■
	Sorters	■			■	
	Fillers	■			■	■
	Packing	■			■	■
	Cutters	■			■	■
	Inspection	■			■	■
	Dosing	■			■	■



Industry Applications

Industry	Application	MD100G	MD100P	MD100H	MDHP	MD100C
Pulp & Paper	Pump & Fan	■	■	■	■	
	Dryers	■	■	■	■	
	Calendars	■			■	
	Rollers	■			■	
	Winders	■			■	
	Chippers	■			■	
	Pulpers	■	■		■	
	Slitters	■			■	
Oil & Gas	Pumps	■			■	
	Drilling	■			■	
	Linear Rod Pumps	■			■	
	Refiners	■			■	
Metal & Steel	Formers	■			■	
	Benders	■			■	
	Slabers	■			■	
	Milling	■			■	
	Smelters	■			■	
	Cutters / Slitters	■			■	
	Winders	■			■	
	Inspecting Machines	■			■	
Chemical & Petrochemical	Mixers	■			■	
	Packing	■			■	
	Conveyors	■			■	
	Dosing	■			■	
	Sorters	■			■	
	Fillers	■			■	
	Refineries	■			■	
Pharmaceutical	Mixers	■			■	■
	Packing	■			■	■
	Conveyors	■			■	■
	Dosing	■			■	■
	Sorters	■			■	■
	Fillers	■			■	■
	Pumps / Fans	■	■	■	■	■
	Dryers	■	■	■	■	■





Optional Accessories

Series	Option	Description
MD100G	MDLV-100G CANopen	CANopen communication card
	MDLV-100G EtherNet	EtherNet communication card
	MDLV-100G Profibus	Profibus-DP communication board
MD100H	LonWorks	LonWorks communication card
MDHP	MD-HP LCD Keypad	Graphic LCD display keypad for MDHP (128x64 COG, 11 Rubber Key, 3 LED, IP21) - Multi language
	MD-HP Remote Cable (2M)	2 meter connection cable between drive and keypad
	MD-HP Remote Cable (3M)	3 meter connection cable between drive and keypad
	MD-HP Isolation I/O	Insulated I/O module, 8 multi-functional inputs and 2 output
	MD-HP Extension I/O	Extension I/O module, 3 multi-functional inputs and 3 output
	MD-HP Encoder	Encoder board for closed loop control
	MD-HP Profibus-DP	Profibus-DP communication board
	MD-HP PLC	PLC card (MK1205 Platform)
	MD-HP R-Net	Rnet communication board
	MD-HP Modbus TCP	100M BASE-TX, 10M BASE-T support
MD100P	MD-HP Devicenet	DeviceNet communication board
	MD-HP LonWorks	LonWorks communication board
	MD-HP CANopen	CanOpen communication board
	MD-100P LCD Keypad	LCD display keypad for MD100P
	MD-100P LonWorks Extension	LonWorks communication board
	MD-100P BACNet	BACNet communication board
	MD-100P RS485/modbus-RTU	RS485 (LS Bus / Modbus RTU) communication board
	MD-100P Devicenet	DeviceNet communication board
	MD-100P Profibus	Profibus-DP communication board
	MD-100P Sub Board E	Current output board
MD100P	MD-100P Remote Cable (2M)	2 meter connection cable between drive and keypad
	MD-100P Remote Cable (3M)	3 meter connection cable between drive and keypad
	MD-100P Remove Cable (5M)	5 meter connection cable between drive and keypad
	MD-100P Modbus-TCP	Modbus TCP communication card







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