



HPV[®] 900



HPV 900 - AC ELEVATOR DRIVE

Magnetek's HPV 900 elevator drive is designed for high performance, high overload capacity and long-life reliability. It has advanced closed-loop vector control for superior motor performance. This drive offers all the special features you want for a smooth ride and accurate starting and stopping. All models include internal dynamic braking IGBT rated for 100% duty cycle.

The HPV 900 is designed for both new installations and modernization elevator projects, and provides the fastest, easiest set-up adjustments, longest life, fewest callbacks and the lowest total lifetime cost.

DESIGNED AND RATED FOR THE ELEVATOR APPLICATION

- No oversizing needed
- Designed with high overload capacity
- An internal dynamic brake IGBT
- Designed for a high operating temperature with long-life components

ELEVATOR APPLICATION SOFTWARE AND PARAMETERS

- Offering the ultimate performance features
- Unique elevator speed regulator
- Parameters are in elevator industry terminology

EASY SET-UP

- No need for mechanical disconnect to tune critical motor parameters
- Parameter upload/download software
- Drive calculates elevator system inertia
- Configurable I/O channels
- Easy parameter changes via digital operator

HPV[®] 900 HARDWARE FEATURES



DESIGNED WITH HIGH OVERLOAD CAPACITY

Can be used without horsepower derating (common with standard drives)

- 2.5 times rated current for 5 seconds
- 1.5 times rated current for 60 seconds

INTERNAL DYNAMIC BRAKE IGBT

- No need to add external braking IGBT (common with standard drives)
- Rated for a 100% duty cycle

DESIGNED WITH LONG-LIFE COMPONENTS

General comparison with other industry drives (stronger in all critical power components)

- Bus capacitors: HPV 900 has more capacitance with higher ripple current capability, higher voltage rating and longer life.
- Diode bridge: HPV 900 has 2.5 times the current capability over other industry drives.

INTERNAL ISOLATED ENCODER POWER SUPPLY

- HPV 900 provides connections for encoder power (+5 and +12 VDC)
- Isolated power supply separates the processor power from the encoder for better noise immunity

ALLOWS CONNECTION TO A 12-PULSE TRANSFORMER BY PROVIDING TWO SETS OF INPUT RECTIFIERS

With the 12-pulse transformer configuration, the 5th and 7th harmonics are eliminated minimizing the current THD. This also gives the lowest RMS input current with the best power factor. Also, the bus capacitor ripple current is lower and at a higher frequency, extending the life of the drive.

CARRIER FREQUENCY OF 10KHZ WITHOUT DRIVE DERATING

- Fixed programmable carrier frequency (2.5 to 16 kHz)
- Above 10 kHz linearly derate both the continuous and peak current levels by 5% for each 1 kHz to a maximum derating of 25%.

FULL FUNCTION REMOVABLE DIGITAL OPERATOR

- Hand-held, push button
- Removable, fully programmable
- LCD 2 x 16-character display

DESIGNED AND TESTED TO MEET THE ELEVATOR DUTY CYCLE

- HPV 900 designed for a worst case duty cycle
- 180 starts/hr - 90 cycles/hr
 - Can operate continuously up to 116% of rated current

ISOLATED ENCODER SIGNALS

- For better noise immunity, the encoder signals are optically isolated from the HPV 900's processor
- Designed with a long life relay output (loop contactor relay)
 - A relay output with an electrical service life of up to 3,000,000 operations depending on operating current

I/O TERMINALS WITH REMOVABLE TERMINALS

- Removable terminals reduce wiring time.
- RS-422 Serial channel
 - RS-422 serial channel at 19.2 K baud with optically isolated receiver
- Programmable: (9) digital inputs, (4) digital outputs, (2) relay outputs
 - Digital inputs are optically isolated
 - Digital outputs are optically isolated
- Analog: (2) programmable outputs, (2) inputs

DIGITAL INPUT POWER SUPPLY OPTIONS (INTERNAL OR EXTERNAL)

The digital input power can use the internal +24VDC supply or use a user supplied external +24VDC supply.

DRIVE'S CONTROL BOARD IS STATE-OF-THE-ART TECHNOLOGY

- Flash based controller with surface mount devices.
- 33MHz Digital Signal Processor (DSP)
- VHDL based Field Programmable Gate Array (FPGA)

CONNECTIONS AVAILABLE FOR BATTERY BACK-UP OPERATION

Easy connections to the DC bus make the connections available for battery back-up operation.

ACCURACY IN TRACKING ANALOG SPEED COMMAND

- Analog speed command is sampled every 2 msec with 12 bit accuracy.
- ± 10 Volts DC with software gain and offset available

DESIGNED FOR A HIGH OPERATING TEMPERATURE

Operating temperature range: -10°C (14°F) to 55°C (130°F)

HPV[®] 900 SOFTWARE FEATURES

PARAMETERS ARE IN ELEVATOR INDUSTRY TERMINOLOGY

- Examples: contract car speed parameter in fpm or m/s
- S-curves defined accel/decel (ft/s^2 / m/s^2) and jerk rates (ft/s^3 / m/s^3)

NO MECHANICAL DISCONNECT TO TUNE CRITICAL MOTOR PARAMETERS

Adaptive Tune - calculates the no-load current (magnetizing current) and the rated slip of the motor

UNIVERSAL MOTOR CONNECTION WITH MINIMAL SET-UP

If an existing or unknown motor is encountered in the field, the adjuster need only enter nameplate data - no specific data requirements. Then running the elevator up and down the hoistway a couple times activates the HPV 900's adaptive tune circuit to achieve best performance.

DRIVE CALCULATES ELEVATOR SYSTEM INERTIA

No complex calculations or tests necessary. The HPV 900 uses engineering units (not just arbitrary gains) for speed regulator tuning. The critical tuning parameter, inertia, is calculated by the drive.

FEWER AND EASILY NAVIGATED PARAMETERS

- Fewer parameters than standard drives (elevator specific software)
- Advanced parameters can be hidden (easier navigation)

REDUCE ROPE RESONANCE FOR DIFFICULT HOISTWAYS

- High/Low Gain - reduces response of speed regulator at higher speeds.
- Tach Rate gain - subtracts a portion of the speed feedback derivative from the output of the speed regulator.

UNIQUE SPEED REGULATOR FOR BEST RIDE QUALITY AND IMPROVED LANDING ACCURACY

- Elevator Speed Regulator provides no overshoot at the end of accel or decel periods.
- In contrast, a typical PI speed regulator has an overshoot at the end of the accel or decel periods.

NO FALSE MULTI-STEP SPEED COMMANDS

Since multi-step speed commands are selected with external contacts, a new command selection must be present for 50 ms before it is recognized.

PROVIDES SERIAL COMMUNICATIONS FOR CONTROL OF DRIVE

Magnetek offers standard elevator protocol via RS-422 serial channel at 19.2 K baud.

UPLOAD/DOWNLOAD PARAMETERS VIA PC

The HPV 900 has the ability to upload and download the parameters values via computer.

CONTROLLING BRAKE SLIPPAGE

Ramp Down Stop - an option that allows the motor torque to be gradually reduced while setting the brake.

CONTROL MECHANICAL BRAKE AND MOTOR CONTACTOR

HPV 900 software has handshaking signals available for use in the control of the elevator's mechanical brake and the motor contactor.

PRE-CONFIGURED DRIVE MAKES JOB SITE SET-UP SIMPLE

- HPV 900 can be pre-configured with customer-specific parameter defaults.
- On the job site, the pre-configured HPV 900 need only have the "Contract Car Speed" and "Contract Motor Speed" parameters changed.

PRE-TORQUE COMMAND

Eliminate car roll-back by priming the speed regulator via a pre-torque command on an analog input channel (i.e. from a load weighing device) or serial channel

QUICK FLUX BUILD-UP IN THE MOTOR

- The HPV 900 can build up the flux in the motor in 120 to 160 msec.
- A "flux built-up" signal is available for use by the car controller.

INTERNAL SPEED GENERATION VIA FOUR INTERNAL S-CURVES WITH SEPARATE LEVELING JERK RATE

Multiple S-curves can be configured for short runs, long runs, emergency stopping and inspection. Each S-curve has four unique characteristics: accel rate, decel rate, jerk rate and separate leveling jerk rate.

OPTIMIZED FLUX WEAKENING FOR ELEVATOR APPLICATIONS

With standard drives, only 100% of the motor's rated torque can be achieved at rated speed. The HPV 900 optimized flux reference allows for additional torque capability (up to 200% depending on motor) at the motor's rated speed. This allows the HPV 900 to obtain maximum KVA utilization of the drive.

EASILY ENABLED OVERSPEED TEST FEATURE

- Used during elevator inspections.
- Easily initiated overspeed test via operator or logic input, both speed command and overspeed limit are increased a defined level for a single run.

KEEP A LIBRARY OF MOTOR PARAMETERS

For ease in set-up, a library of motor parameters can be kept in the HPV 900 software.

INTERNAL MOTOR OVERLOAD

User defined motor overload curve meets the CSA/UL requirements.

HPV® 900 AC ELEVATOR DRIVE PRODUCT DATA

Rated Input Voltage	Rated HP	Rated kW	Continuous Output Current General Purpose Rating (A)	Continuous Output Current Elevator Duty Cycle Rating (A)	Maximum Output Current for 5 Sec	Dimensions			Weight			
						Height	Width	Depth				
380V to 480V	5	3.7	8	9	20	17in (430mm)	11in (280mm)	11in (280mm)	48 lbs (22 kg)			
	10	7.5	16	18	40							
	15	11	21	24	52.5							
	380V to 480V	20	15	27	31	67.5	24in (610mm)	15in (380mm)	11in (280mm)	78 lbs (35 kg)		
		25	18	34	39	85						
		30	22	41	47	102						
		40	30	52	60	130						
		50	37	65	75	162						
		60	45	77	89	192						
75	55	96	111	240	29in (740mm)	19in (480mm)	12in (310mm)	139 lbs (63 kg)				
200V to 240V	7.5	5.5	25	29	62.5	17in (430mm)	11in (280mm)	11in (280mm)	48 lbs (22 kg)			
	10	7.5	27	31	67.5	24in (610mm)	15in (380mm)	11in (280mm)	78 lbs (35 kg)			
	15	11	41	47	102							
	20	15	52	60	130							
	200V to 240V	25	18	75	84	170	27in (690mm)	15in (380mm)	11in (280mm)	82 lbs (37 kg)		
		30	22	88	99	200						
		40	30	104	120	260	29in (740mm)				19in (480mm)	12in (310mm)

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- All ratings at 50/60 Hz and 10 kHz carrier frequency and are based on a geared elevator application.
- Dimensions and weights reflect the basic open frame model; a NEMA-1 cover option is available.
- All models include internal dynamic brake IGBT rated for 100% duty.
- Operating temperature: -10°C (14°F) to 55°C (130°F)
- Standards: CSA and CE.