HARRINGTON HOISTS AND CRANES

Variable Frequency Drives (Inverters)
ER Hoists
1 to 10L Ton

Purpose:

This document provides information for the Variable Frequency Drives (VFD's) packages available from Harrington for use with ER electric chain hoists. Described are the basic VFD applications as they apply to the ER hoist.

Variable Frequency Drives:

VFD packages are mounted directly to the trolley in an electrical enclosure and include:

- VFD programmed and tested to the customers specifications
- Branch circuit fuses to protect the drive and motor
- All necessary hardware and wiring

Harrington Part No.	Voltage	ER Hoist Models*	Enclosure Part No.
VFD123ER	208-230V-3-60	ER001H, ER003S, ER005L	9006731
VFD223ER		ER003H, ER005S, ER010L	
VFD523ER		ER010S, ER015S, ER020L	
VFD723ER		ER020S, ER025S, ER030L, ER050L	9006732
VFD1023ER		ER030S, (4.7 & 6.2 HP ER080S, ER100L)	
VFD146ER	460V-3-60	ER001H, ER003S, ER005L	9006731
VFD246ER		ER003H, ER005S, ER010L	
VFD346ER		ER010S, ER015S, ER020L	
VFD746ER		ER020S, ER025S, ER030L, ER050L, (4.7 HP ER080S, ER100L)	9006732
VFD1046ER		ER030S, (6.2 HP ER080S, ER100L)	

* For ER100S, 150S and 200S see note 13 on page 3.

VFD Basics:

VFD's control a motor by switching the 3 phase AC power source on and off (starting and stopping the motors) and by varying the power source frequency (Hz). By varying the frequency, the speed of the motor is affected proportionally – i.e. ½ the frequency equals ½ the motor speed. The VFD replaces the standard hoist contactor control.

The VFD Harrington offers is programmable and controlled by a microprocessor. It is designed specifically for hoist and crane applications and comes preloaded with many easy-to-select programs which fit numerous applications. The most common applications are listed below. Once a program has been selected for the application, individual parameters such as acceleration, and speeds can be changed or "tweaked" as required. Program changes are easily accomplished in the field.

Applications:

Soft start only — Provides adjustable acceleration, and one speed. This allows the hoist's speed to gradually ramp up. Uses single speed control pendant (1 step buttons).

Multi-speeds — Provides up to 5 "repeatable" speeds and allows for adjustable acceleration and deceleration between speeds. The number of pendant button steps corresponds to the number of speeds the VFD provides – i.e. 3 step button = 3 speeds.

Infinitely Variable — Provides the ability to lock into any speed that the operator accelerates or decelerates to. To accomplish this, 3 step pendant buttons are used as follows:

- 3rd Step (fully depressed): Hoist accelerates and stops accelerating if the highest speed is reached.
- 2nd Step: Hoist holds a constant speed that was reached by accelerating or decelerating.
- 1st Step: Hoist holds a constant speed that was reached by accelerating or decelerating. If the button is depressed to the first step when the hoist is stopped, the hoist will lift/lower at the lowest speed.
- Let Go of Button: Hoist will stop immediately.

Pendant Requirements:

Pendant Assembly for multiple speeds:

Refer to the information pertaining to the individual pendant for the number of button steps/speeds available.

Pendant Cords for ER's, ERP's, & ERG's:

ER Speeds or Pendant Button Steps	Conductors Required		Pendant Cable	
ER Hoist	NEMA 3R Pendant	NEMA 4 Pendant	NEMA 3R Pendant	NEMA 4 Pendant
1	3	4	16/3P	16/4P
2	4	5	16/4P	16/6P
3 or Infinite	5	6	16/6P	16/6P
4	6	7	16/6P	16/8P
5	8	9	16/8P	16/12P

Pendant Cords for ERM's:

ERM Speeds or Pendant Button Steps		Conductors Required		Pendant Cable	
ER Hoist	MR Trolley	NEMA 3R Pendant	NEMA 4 Pendant	NEMA 3R Pendant	NEMA 4 Pendant
1	1	5	6	16/6P	16/6P
2	1	6	7	16/6P	16/8P
3 or Infinite	1	7	8	16/8P	16/8P
4	1	8	9	16/8P	16/12P
5	1	9	10	16/12P	16/12P
1	2	6	7	16/6P	16/8P
2	1	6	7	16/6P	16/8P
2	2	7	8	16/8P	16/8P
3 or Infinite	2	8	9	16/8P	16/12P
4	2	9	10	16/12P	16/12P
5	2	10	11	16/12P	16/12P

Notes:

1. Hook mounted applications the VFD enclosure is to be mounted within 5' of the hoist.
2. Refer to EDOC0xxx for important dimensions associated with using this enclosure on PTS/GTS trolleys. For manual trolley applications you **must** use the **TS** style trolley.
3. Refer to EDOC0130 for important dimensions associated with using this enclosure on MR trolleys.
4. Standard enclosure is NEMA 12/13.
5. NEMA 4 or 4X enclosures available per special quote.
6. The VFD utilizes ER hoist transformer for control voltage (110V). The optional 24 or 48V are not available with VFD applications.
7. VFD's can be used with L, S or H hoist models. Hoist **must** have mechanical load brake (**ER only**, not NER).
8. Use VFD's with single speed motors only.
9. Hoist must have lower limit switch. Refer to EDOCxxx for kit required (5 ton and below only).
10. All ER VFD applications are limited to 10 to 100% of the hoist's rated speed.
11. If 575V, a special quote is required.
12. If other ER or MR options are used in conjunction with the ER VFD a special quote is required. These options include, but are not limited to: trolley VFD, Mainline Contactor (761), Selector Control, etc.
13. ER100S, 150S and 200S have two hoist bodies and require two VFD's per hoist. Consult Custumer Service for availability and special quote.