

WORKHORSE™



Naturallighting.com
 1.888.900.6830
 www.naturallighting.com
 email: larry@naturallighting.com

FLUORESCENT IN-FIXTURE ELECTRONIC BALLASTS

- 9 ballasts operate
- 124 Lamps in
- 756 combinations.

- Solid-State Electronics
- High Power Factor
- Small Case Size
- Lightweight
- Versatile
- Energy Saving



Naturallighting.com
 1.888.900.6830
 www.naturallighting.com
 email: larry@naturallighting.com

BALLAST SPECIFICATIONS COMMON TO ALL WORKHORSE

Operating Voltage	120 VAC ± 10%	Protection/Input	Over Current	Fuse
	277 VAC ± 10%		Voltage Transients	MOV (PER ANSI C82.11 - 1993)
Frequency	50/60 Hz		EMI/RFI	FCC PART 18-A
ATHD	Meets ANSI C82.11-1993			

1 WORKHORSE 1 Maximum Power 28 Watts Model No. WH1-120-L Maximum Current (120vac) .21 AMP Model No. WH1-277-L Maximum Current (277vac) .13 AMP Black/White Wires 12 Inches Red/Yellow Wires 24 Inches Ballast Case Size H 7.75", W 1", L 7.5" Ballast Weight 4.5 OZ Case Quantity & Weight 50 pcs. 15 lbs. 	2 WORKHORSE 2 Maximum Power 35 Watts Model No. WH2-120-L, WH2-120-C (BLS) Maximum Current (120vac) .25 AMP Model No. WH2-277-L, WH2-277-C (BLS) Maximum Current (277vac) .14 AMP Black/White Wires L-18" C-12" Red/Yellow Wires L-36" C-12" Case L=H 1", W 1.25", L 5.5" C=H 1", W 2.3", L 3.35" Ballast Weight 7 OZ Case Quantity & Weight 50 pcs. 22lbs. 	22 WORKHORSE 22 Maximum Power 35 Watts Model No. WH22-120-L, WH22-120-C (BLS) Maximum Current (120vac) .25 AMP Model No. WH22-277-L, WH22-277-C (BLS) Maximum Current (277vac) .18 AMP Black/White Wires L-18" C-12" Red/Yellow Wires L-36" C-12" Case L=H 1", W 1", L 5.5" C=H 1", W 2.3", L 3.35" Ballast Weight 7 OZ Case Quantity & Weight 50 pcs. 22lbs. 	3 WORKHORSE 3 Maximum Power 64 Watts Model No. WH3-120-L, WH3-120-C (BLS) Maximum Current (120vac) .55 AMP Model No. WH3-277-L, WH3-277-C (BLS) Maximum Current (277vac) .28 AMP Black/White Wires L-18" C-12" Red/Yellow Wires L-36" C-12" Case L=H 1", W 1.5", L 6.5" C=H 1", W 3.1", L 3.82" Ballast Weight 10 OZ Case Quantity & Weight 50 pcs. 32 lbs.
-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------	-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------	--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------	------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------

33 WORKHORSE 33 Maximum Power 64 Watts Model No. WH33-120-L, WH33-120-C (BLS) Maximum Current (120vac) .55 AMP Model No. WH33-277-L, WH33-277-C (BLS) Maximum Current (277vac) .35 AMP Black/White Wires L-18" C-12" Red/Yellow Wires L-36" C-12" Case L=H 1", W 1.5", L 6.5" C=H 1", W 3.1", L 3.82" Ballast Weight 10 OZ Case Quantity & Weight 50 pcs. 32 lbs. 	4 WORKHORSE 4 Maximum Power 70 Watts Model No. WH4-120-L Maximum Current (120vac) .55 AMP Model No. WH4-277-L Maximum Current (277vac) .28 AMP Black/White Wires 18 Inches Red/Yellow Wires 36 Inches Ballast Case Size H 1", W 1.5", L 6.5" Ballast Weight 10 OZ Case Quantity & Weight 50 pcs. 32 lbs. 	5 WORKHORSE 5 Maximum Power 128 Watts Model No. WH5-120-L Maximum Current (120vac) 1.05 AMP Model No. WH5-277-L Maximum Current (277vac) 0.60 AMP Black/White Wires 18 inches Red/Yellow Wires 36 inches Ballast Case Size H 1", W 1.72", L 9.5" Ballast Weight 14 OZ Case Quantity & Weight 50 pcs. 44 lbs. 	6 WORKHORSE 6 Maximum Power 140 Watts Model No. WH6-120-L Maximum Current (120vac) 1.05 AMP Model No. WH6-277-L Maximum Current (277vac) 0.60 AMP Black/White Wires 18 inches Red/Yellow Wires 36 inches Ballast Case Size H 1", W 1.72", L 9.5" Ballast Weight 14 OZ Case Quantity & Weight 50 pcs. 44 lbs. 	7 WORKHORSE 7 Maximum Power 220 Watts Model No. WH7-120-L Maximum Current (120vac) 2.0 AMP Model No. WH7-277-L Maximum Current (277vac) 1.1 AMP Black/White Wires 18 inches Red/Yellow Wires 36 inches Ballast Case Size H 1", W 1.72", L 18.5" Ballast Weight 18 OZ Case Quantity & Weight 25 pcs. 29 lbs.
------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------	---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------	-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------	-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------	------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------

Naturallighting.com
 1.888.900.6830
 www.naturallighting.com
 email: larry@naturallighting.com



FLUORESCENT T5 ULTRA-SLIM
 ELECTRONIC BALLASTS

- **2** ballasts operate
- **41** Lamps in
- **70** combinations.

- *All the Features of WorkHorse*
- *Designed for Thin Undercabinet Pans, Like the Adam Metal 315*
- *3/4" x 1" Cross Section Allows the WHAM to Easily Fit Extrusions*
- *See the WorkHorse 1 for Another 3/4" x 1" Case for T2 Lamp Applications*





Protection/Output
 Open Lamp
 Shorted Lamp



Regulatory Approvals UL & cUL Listed
 Type 1 Outdoors
 High Power Factor > .90
 Open Circuit Voltage 600 V RMS Max.

Ballast Min. Operating Temp. -20° F (-30° C)
 Ballast Maximum case Temp. 158° F (70° C)
 Ballast Lamp Starting Mode Instant Start
 Class P (Thermal) Sound Rating - A

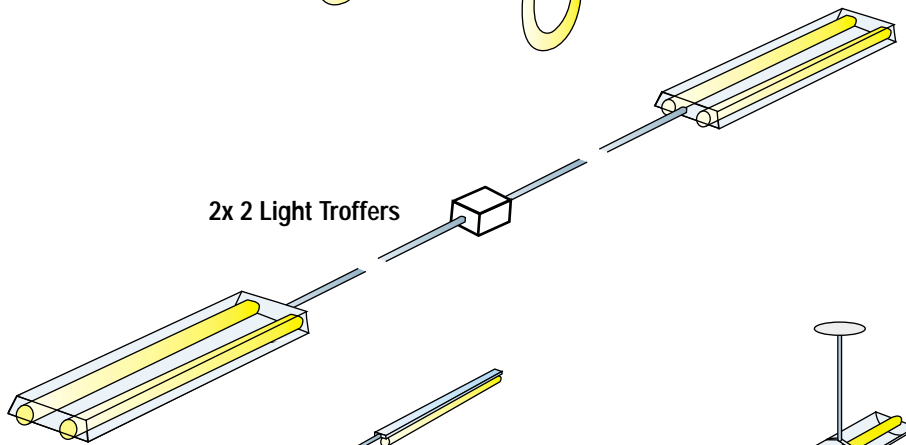
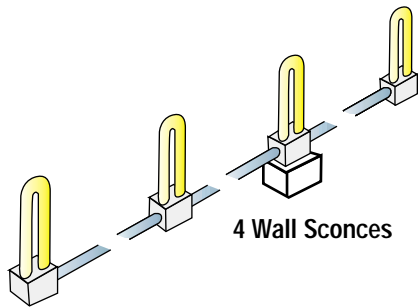
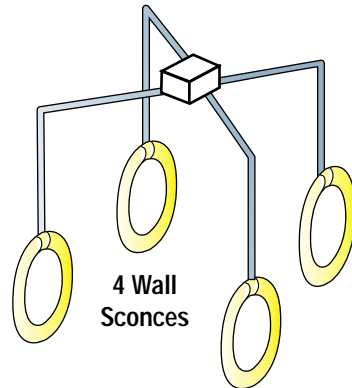
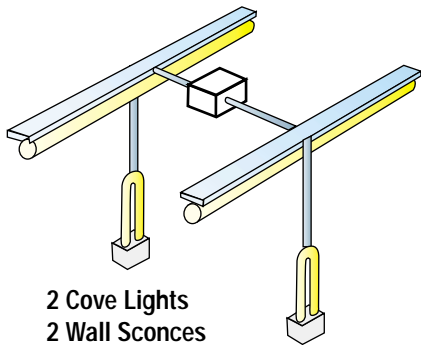
Naturallighting.com
 1.888.900.6830
 www.naturallighting.com
 email: larry@naturallighting.com

1 WHAM 1	2 WHAM 2
Maximum Power 35 Watts	Maximum Power 28 Watts
Model No. WHAM1-120-135-L	Model No. WHAM2-120-213-L
Maximum Current (120vac) .32 AMP	Maximum Current (120vac) .22 AMP
Black/White Wires 18 Inches	Black/White Wires 18 Inches
Red/Yellow Wires 36 Inches	Red/Yellow Wires 36 Inches
Ballast Case Size H .75", W 1", L 7.5"	Ballast Case Size H .75", W 1", L 7.5"
Ballast Weight 4.5 OZ	Ballast Weight 4.5 OZ
Case Quantity & Weight 50 pcs. 15 lbs.	Case Quantity & Weight 50 pcs. 15 lbs.
	

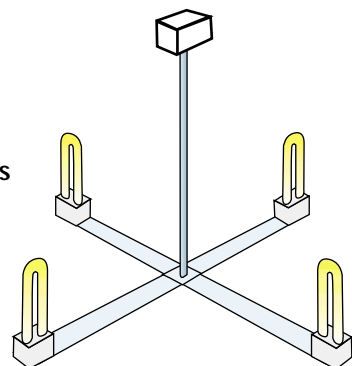
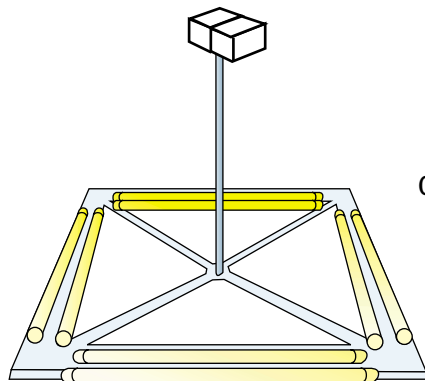
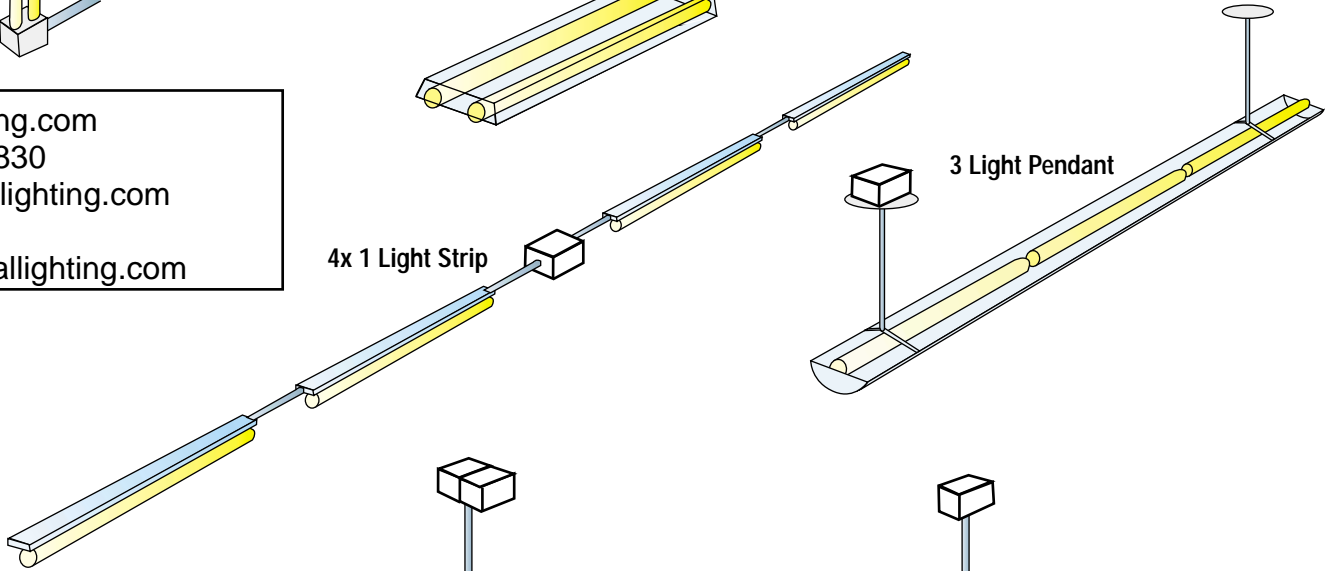
LONGHORSE

There are *1000's* of ways to use the LongHorse, below you will find just a few.

The measurement of 20 feet from the lamp was taken by using wire most commonly used in the industry, in normal commercial environments, and driving standard lamps. Distance may increase or decrease depending upon your requirements such as the type of wire employed, electrical and environmental considerations, or the types and age of lamps used. Contact Fulham for details on remote capability of the LongHorse in your specific application.



Naturallighting.com
1.888.900.6830
www.naturallighting.com
email:
larry@naturallighting.com



COMPACT LAMP CHART 4 PIN ONLY

1. Find your lamp type.

3. Look across and find the ballast you need.

2. The quantity & wattage of lamps.

4. The colored number represents your wiring diagram



BIAX

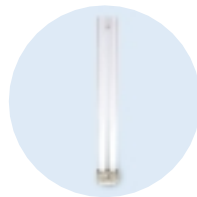
WORKHORSE

WHAM

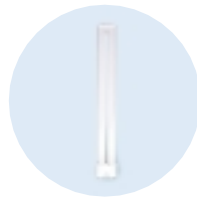
LONGHORSE

	WH 1	WH 2	WH 22	WH 3	WH 33	WH 4	WH 5	WH 6	WH 7	WM 1	WM 2	LH 1	LH 2	LH 3	LH 4	LH 5	LH 6	LH 7
1 X 5W	3	2				2				15	2	3	2					
2 X 5W		1	1			1		9					1				9	
3 X 5W								8									8	
4 X 5W					7		7	7									7	
1 X 7W	3	2								15	2	3	2					
2 X 7W		1				1		9			1		1				9	
3 X 7W								8									8	
4 X 7W								7									7	
1 X 9W	3	2								15	2	3	2					
2 X 9W		1				1					1		1				8	
3 X 9W								8									8	
4 X 9W								7									7	
1 X 11W	3									15	2	3						
2 X 11W		1				1					1		1					
3 X 11W								8									8	
4 X 11W								7									7	
1 X 13W		3	2	2		2		14			3		3	2			14	
2 X 13W			1	1	9		9	11						1		9	11	
3 X 13W					8		8									8		
4 X 13W					7		7									7		
1 X 18W		3	2	2	14	2		14			3		3	2	3	14	14	
2 X 18W			1	1	9		9	9						1		9	9	
3 X 18W					8		8									8		
4 X 18W							7									7		
1 X 24W		3	2	2	14	3	14	14			3		3	2	3	14	14	
2 X 24W				1	9		9	11							1	9	11	
3 X 24W							8									8		
1 X 27W		3	2	2	14	3	14	14			3		3	2	3	14	10	
2 X 27W					9		9	11								9	11	
4 X 27W									7									7
1 X 28W PA			3	3	14		14	10						3		14	10	
2 X 28W PA					11		11									11		
3 X 28W PA									8									8
4 X 28W PA									7									7
1 X 36W OS/PH		3	2	2	14	3	14	10					3	2	3	14	10	
2 X 36W OS/PH							9	11								9	11	
4 X 36W OS/PH									7									7
1 X 36W GE/PA				3	14		14	10						3		14	10	
2 X 36W GE/PA							11									11		
3 X 36W GE/PA									8									8
4 X 36W GE/PA									7									7
1 X 39W				3	14		14	10						3		14	10	
2 X 39W							11									11		
3 X 39W									8									8
4 X 39W									7									7
1 X 40W				2	14	2		14									14	
2 X 40W							9	11								9	11	
3 X 40W							8									8		
4 X 40W OS									7									7
1 X 50W PH					14	3	14	10								14	10	
1 X 50W GE				3			14	10						3		14	10	
2 X 50W PH							11	11								9	11	
3 X 50W									8									8
4 X 50W									7									7
1 X 55W OS				3	10		10	12						3		10	12	
2 X 55W OS							11		9							11		9
3 X 55W OS									8									8
1 X 55W PA					10		12	13	14							12	13	14
2 X 55W PA									11									11
1 X 96W PA							12		14							12		14
2 X 96W PA									11									11

CFT, PS-S/4P,
PL-L-BX/4P-CFDS/E,
DL



BIAX



PH=Phillips
PA=Panasonic
GE=General Electric
OS=Osram Sylvania
TO=Toshiba

COMPACT LAMP CHART 4 PIN ONLY



FLAT
QUAD
DF, FQL

Naturallighting.com 1.888.900.6860

www.naturallighting.com email: larry@naturallighting.com

WORKHORSE

WHAM

LONGHORSE

FLAT QUAD

	WH 1	WH 2	WH 22	WH 3	WH 33	WH 4	WH 5	WH 6	WH 7	WM 1	WM 2	LH 1	LH 2	LH 3	LH 4	LH 5	LH 6	LH 7
1 X 18W OS		3	2	2	14	3	14	14			3		3	2	3	14	14	
2 X 18W OS					9		9	11								9	11	
3 X 18W OS							8									8		
3 X 18W PA																		8
4 X 18W PA									7									7
1 X 24W OS		3	2	2	14	3		14			3		3	2	3		14	
2 X 24W OS				1	9			9	11					1		9	11	
3 X 24W OS								8								8		
1 X 28W PA				3	10		10	13						3		10	13	
2 X 28W PA									9									9
1 X 36W OS		3		2	14	3	14	10					3	2	3	14	10	
2 X 36W OS					9		9	11								9	11	
4 X 36W OS									7									7
1 X 55W PA					10		12	13	14							12	13	14
2 X 55W PA									11									11
1 X 96W PA							12		14							12		14
2 X 96W PA									11									11

QUAD

1 X 10W	3	2				2				15	2	3	2		2			
2 X 10W		1	1			1		9					1		1		9	
3 X 10W								8									8	
4 X 10W					7			7									7	
1 X 13W	3	2								15	2	3	2					
2 X 13W		1				1					1		1		1			
3 X 13W								8									8	
4 X 13W								7									7	
1 X 18W	3	2				2				15	2	3	2		2			
2 X 18W				1		1		9						1			9	
3 X 18W					8		8	8								8	8	
4 X 18W					7		7									7		
1 X 18W PA			3		14	3	14	10							3	14	10	
2 X 18W PA					11		11	11								9	11	
4 X 18W PA									7									7
1 X 26W		3	2	2	14	3		14			3		3	2	3		14	
2 X 26W				1	9			9	11					1		9	11	
3 X 26W								8								8		
4 X 26W								7								7		
1 X 27W PA					10		10	13	14							10	13	14
2 X 27W PA									9									9

TRIPLE BIAX

1 X 13W	3	2								15	2	3	2			1		
2 X 13W		1				1					1		1					
3 X 13W								8									8	
4 X 13W								7									7	
1 X 18W	3	2				2				15	2	3	2		2			
2 X 18W				1				9						1			9	
3 X 18W					8			8									8	
4 X 18W					7		7									7		
1 X 26W		3	2	2	14	3		14			3		3	2	3		14	
2 X 26W					9			9	11							9	11	
3 X 26W								8								8		
4 X 26W								7								7		
1 X 32W		3	2	2	14	3	14	14					3	2	3	14	14	
2 X 32W					9		9	11								9	11	
3 X 32W							8									8		
1 X 42W				2	14	3	14	14						2	3	14	14	
2 X 42W							9	11								9	11	
3 X 42W							8									8		

Naturallighting.com 1.888.900.6860
www.naturallighting.com email: larry@naturallighting.com

COMPACT LAMP CHART 4 PIN ONLY

1. Find your lamp type.
2. The quantity & wattage of lamps.
3. Look across and find the ballast you need.
4. The colored number represents your wiring diagram



QUAD
CFQ, PL-C-
DBX/4P-CFDD/E



TRIPLE BIAX
CFM, PL-T-
TBX/4P-CEFD/T/E



WORKHORSE

WHAM

LONGHORSE

2D

	WH 1	WH 2	WH 22	WH 3	WH 33	WH 4	WH 5	WH 6	WH 7	WM 1	WM 2	LH 1	LH 2	LH 3	LH 4	LH 5	LH 6	LH 7
1 X 10W	3	2						9		15	2	3	2				9	
2 X 10W		1				1					1		1				8	
3 X 10W								8									7	
4 X 10W								7										
1 X 16W	3	2				2				15	2	3	2		2			
2 X 16W			1					9									9	
3 X 16W								8									8	
4 X 16W					7		7	7								7	7	
1 X 21W		2				2									2			
2 X 21W				1				9						1			9	
3 X 21W					8		8	8								8	8	
4 X 21W							7									7		
1 X 28W		3	2	2		2		14			3		3	2	2		14	
2 X 28W				1	9			11						1			9	9
3 X 28W								8									8	
4 X 28W								7									7	
1 X 38W				2	14	3	14	14						2	3	14	10	
2 X 38W							9	11								9	11	
4 X 38W									7									7
1 X 55W					12		12		14							12		14
2 X 55W									11									11

CIRCLELINE

1 X 20W		3	2	2	14	3	14	14			3		3	2	3	14	10	
2 X 20W					9		9	11								9	11	
4 X 20W									7									7
1 X 22W		3	2	2	14	3	14	14			3		3	2	3	14	10	
2 X 22W					9		9	11								9	11	
4 X 22W									7									7
1 X 32W			3	3	14		14	10						3		14	10	
2 X 32W					11		11											
3 X 32W									8									8
4 X 32W									7									7
1 X 40W				2	14	3	14	10							3	14	10	
2 X 40W							9	11								9	11	
4 X 40W									7									7
1 X 22+32				1			9	11						1		9	11	
1 X 32+40							11									11		

T5 CIRCLELINE

1 X 22W		3	2	2	14	3		14			3		3	2	3		14	
2 X 22W					9		9	11								9	11	
3 X 22W					8		8									8		
1 X 40W				2	14	3	14	14						2	3	14	14	
2 X 40W							9	11								9	11	
1 X 55W OS				3				12						3			12	
2 X 55W OS							11		9							11		9
1 X 22+40				1			9	11						1		9	11	



2D
CFS, 2D/4P

Naturallighting.com
1.888.900.6830
www.naturallighting.com
email: larry@naturallighting.com



CIRCLELINE
1-1/8" dia.



T5 CIRCLELINE
5/8" dia.



Naturallighting.com
 1.888.900.6830
 www.naturallighting.com
 email: larry@naturallighting.com

HID REGULATING
 ELECTRONIC BALLASTS

- *Constant Power and Light*
- *Enhanced Color Uniformity*
- *Wide Lamp Type Compatibility*
- *Improved Lumen Maintenance*
- *Longer Lamp Life*
- *Energy Saving*
- *Small, One Piece Design*
- *Lower Operating Cost*



Naturallighting.com
 1.888.900.6830
 www.naturallighting.com
 email: larry@naturallighting.com

BALLAST SPECIFICATIONS *COMMON TO ALL HIGHHORSE*

Operating Voltage	120 VAC ± 10%	Type 1 Outdoors, suitable for recessed use	
	277 VAC ± 10%	Ballast Min. Operating Temp.	-20° F (-30° C)
Frequency	50/60 Hz	Ballast Maximum case Temp.	158° F (70° C)
Protection/Input	ANSI C62.41	Class P (Thermal)	Sound Rating - A
Voltage Transients	MOV (PER ANSI C82.11 – 1993 & C62.41)	EMI/RFI - Complies with FCC 18C, non-consumer limits	
Regulatory Approvals	UL & cUL Listed/Complies with UL 1029		

METAL HALIDE

Voltage - 120VAC 50/60 Hz (Universal Voltage 120-277 50/60Hz Available Summer 2001)

Power Factor >.98

ATHD (Total Harmonic Distortion) <10%

Lamp Current Crest Factor - 1.4 Typical

Lamp Frequency - Low Frequency Square Wave

Thermal Protection - Automatic Resetting Thermal Switch

Ballast	HH-MH-120-039	HH-MH-120-050	HH-MH-120-070	HH-MH-120-100	HH-MH-UNV-150	HH-MH-UNV-175	HH-MH-UNV-250	HH-MH-UNV-400
Lamp Type	M130 39Watt	M110 50 Watt	M98 70 Watt	M90 100 Watt	M102 150 Watt	M57 175 Watt	M58 250 Watt	M59 400 Watt
Power	43W	63W	82W	112W				
Current	.4A	.55A	.72A	1A				
Case Size	Case A	Case A	Case A	Case A	Case C	Case C	Case C	Case E

LOW PRESSURE SODIUM

Voltage - 120VAC and 277 VAC ±10% 50/60Hz

Power Factor >.9

ATHD - meets ANSI C82.11. - 1993

Lamp Frequency - High Frequency

Ballast	HH-LP-120-018	HH-LP-120-035	HH-LP-120-055	HH-LP-120-090	HH-LP-120-135
Ballast	HH-LP-277-018	HH-LP-277-035	HH-LP-277-055	HH-LP-277-090	HH-LP-277-135
Lamp Type	L69 18 Watt	L70 35 Watt	L71 55 Watt	L72 90 Watt	L73 135 Watt
Power	25W	45W	65W	115W	155W
Current	.25A/.11A	.4A/.17A	.56A/.25A	1A/.45A	1.4A/.62A
Case Size	Case F or G	Case F or G	Case B or H	Case B or H	Case D or I

Naturallighting.com
 1.888.900.6830
 www.naturallighting.com
 email: larry@naturallighting.com

MERCURY VAPOR

Voltage - 120VAC and 277 VAC ±10% 50/60Hz

Power Factor >.90

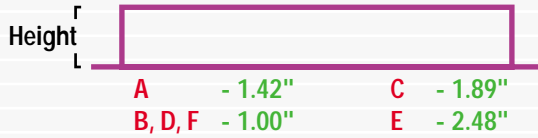
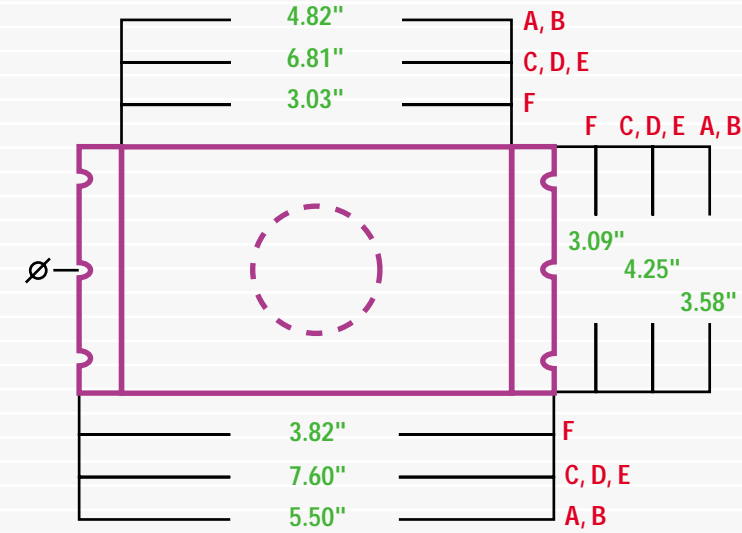
ATHD - meets ANSI C82.11. - 1993

Lamp Frequency - High Frequency

Ballast	HH-MV-120-050	HH-MV-120-075	HH-MV-120-100
Ballast	HH-MV-277-050	HH-MV-277-075	HH-MV-277-100
Lamp Type	H45 40-50 Watt	H43 75 Watt	H38 or H44 100 Watt
Power	58W	85W	115W
Current	.5A/.25A	.75A/.35A	1A/.45A
Case Size	Case G or F	Case B or H	Case B or H

HIGHHORSE

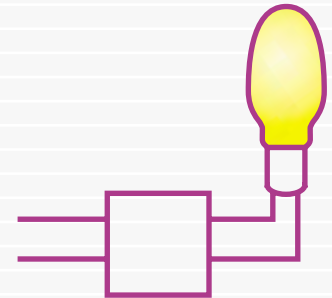
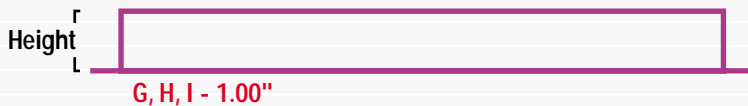
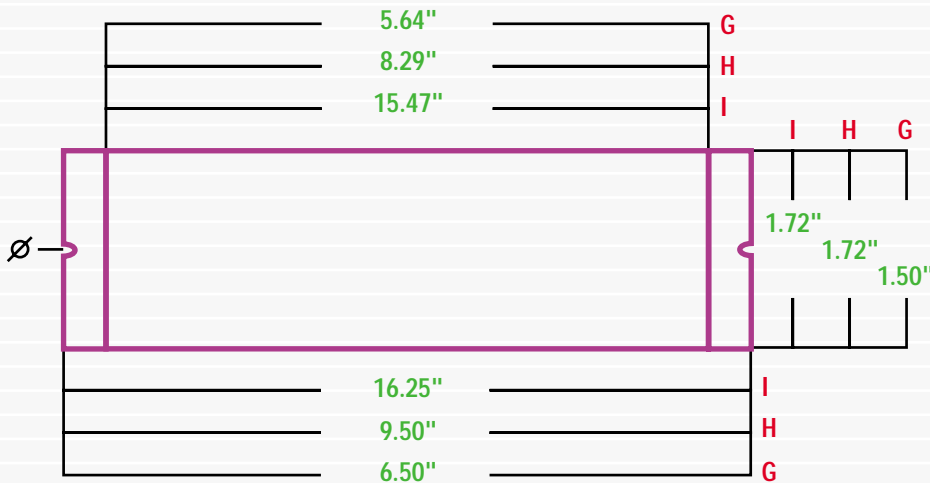
CASE DIMENSIONS - A,B,C,D,E,F



Stud Size 8/32 x 3/8"
To order ballast with studs add "BLS" to part number.

Naturallighting.com
1.888.900.6830
www.naturallighting.com
email: larry@naturallighting.com

CASE DIMENSIONS - G,H,I



Typical HIGHHORSE wiring diagram.