

CAROUSEL SPECIFICATIONS



Design Overview

The design of the Megastar top-drive Horizontal Carousel is unique and delivers advantages over other designs. Megastar horizontal carousels utilize a top drive design, whereby the load is accommodated in carriers (bins), which are supported by high strength bolts, heavy-duty reinforced cast yokes and roller bearing wheels. The wheel and yoke assemblies ride on a stainless steel tubular track mounted above the carriers such that all carriers are supported from the top. This design places all load carrying member in tension, which is superior to compression loading. The bottom guide wheels on the lower carrier bracket ride along a lower track that is attached to bases, which in turn anchor directly to the floor. The drive unit is mounted in-line with the drive sprocket, integral to the machine, at the top. The following provides a summary of the design features and corresponding benefits of the Megastar Horizontal Carousel system.

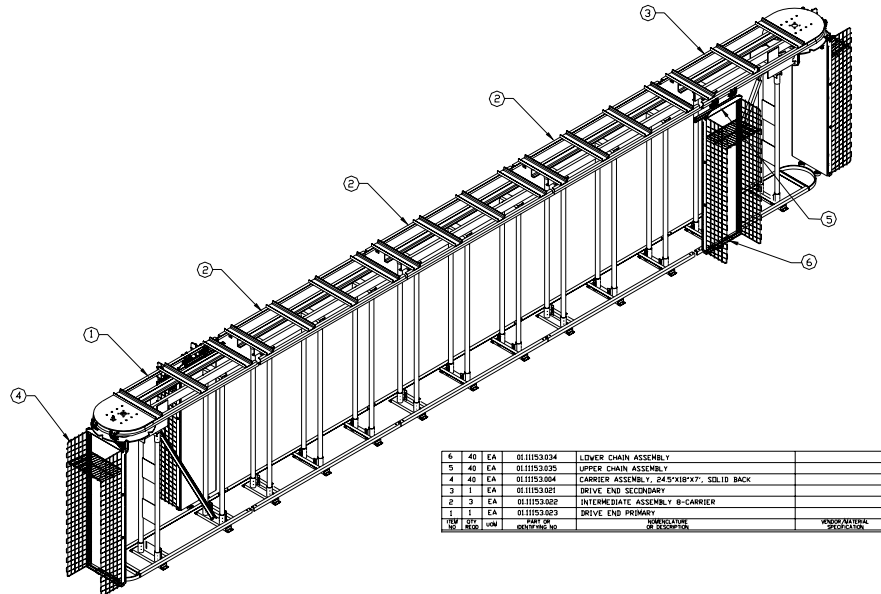
Drive System Feature & Benefits

- ❖ The SM-CYCLO speed reducers are specifically selected for their capacity for frequent Stop-Start and severe reversing applications. Routine overload capacity is the industry's best at 200%.
- ❖ The SM-CYCLO reducer has the highest shock overload capacity, rated at 500+%. Horsepower for horsepower, the SM-CYCLO reducer delivers much better shock load absorption compared to conventional helical gear or worm gear reducers.
- ❖ The overhung load capacity of each of the four sizes of gear reducer specified by Megastar (1 hp, 1.5 hp, 2 hp and 3 hp) is from 5 to 7 times greater than the applied overhung load. Use of high capacity bearings and large diameter forged output shafts gives higher overhung load capacity size-for-size than conventional cycloidal reducers.
- ❖ The Megastar carousel drives are optimized for the total live load application: drive specifications range from single 1-hp to dual 3-hp, with a capacity range of 22,500 pounds to 120,000 pounds.

- ❖ Sumitomo testing of SM-CYCLO reducers show negligible wear after 50,000 hours of runtime. This translates to 32 years of carousel operation. No practical upper limit for reduced life has been determined by the manufacturer.
- ❖ Concentric input and output shafts permit direct, inline power transmission with added efficiencies and stress reduction.
- ❖ Nearly frictionless operation virtually eliminates thermal factor limitations.
- ❖ The completely symmetric reducer design results in perfectly balanced centrifugal force. The reducer develops no vibration and so is smooth and quiet not exceeding 65 dB.
- ❖ The ½" thick steel drive sprocket provides for optimum strength and performance. The concentrically mounted sprocket maintains the symmetry of the reducer design.
- ❖ No drive belts and chains to cause jerky operation when the drive is reversed.
- ❖ Low maintenance since lubrication, adjustment or replacement of belts or chains is eliminated.
- ❖ All Megastar specified SM-CYCLO reducers are grease filled from the factory and are ready to operate. Grease lubrication means no oil, no leaks, minimum maintenance and long trouble free life.
- ❖ Megastar inspects and operates 100% of the SM-CYCLO reducers used on horizontal carousels to ensure smooth on-site start-up and prevents potential installation delays.
- ❖ The Megastar drive support structure offers flexibility since it allows for adding bins and upgrading of the gearmotor size by bolting in and changing the MCU. There is no costly replacement of the carousel drive end.

Structural Integrity

The carousel frame is constructed of modular sections, which bolt together at assembly. Upper and lower track sections are pre-fabricated for ease of assembly. Each module is designed to accommodate up to 10 bins, and vary in length depending on the overall number of bins in the machine.



Upper Track Weldment

The main support structure is manufactured from structural steel “C” channel providing a stronger frame that is more resistant to twisting/warping. The upper track weldments use two sets of load bearing members along the length of the machine. The top, load bearing track is 1 ¼” diameter, 0.12” wall 304 SST (stainless steel) round tubing (conforming to ASTM A-554) which is welded to continuous 1 ¾” x 1 ¾” x 3/16” A-36 structural angle iron (capping). The curved end track segments are formed from single, continuous pieces of tubing. Structural A-36 C5 channel sections (cross arms) transfer the load from the track capping to the backbone of the machine.

The backbone is made up of a pair of C5 x 6.7 channels that run the length of the machine. It is the heart of the structure of the carousel, designed to transfer the carousel load from

the cross arm channels to the series of support columns and bases that run the length of the machine. The backbone channels of every Megastar carousel are sufficiently strong and rigid enough to support the additional load of another carousel stacked on top, without the need for additional structures or steelwork.

Load/Guide Support Track

The support track is manufactured from precision stainless steel tubing. Stainless steel tubing was selected for its mechanical properties of hardness, strength, toughness/ductility and resistance to wear and abrasion. It provides the additional benefit of corrosion resistance.

Every length of stainless track is cleaned and quality inspected in the manufacturing process. This ensures a smooth path for wheel travel, free of all surface flaws and discontinuities. This inspection also ensures proper alignment during field assembly.

Support Columns

Support columns are manufactured from Schedule 40 structural tubing and are spaced along the entire length of the machine at about 30" intervals. The two end pair of columns are formed into ladder-like structures by adding gusset plates between them for additional rigidity. Tubing provides superior vertical and torsion capacity reducing lateral movement and enabling Megastar Horizontal Carousels to be double or triple stacked without the need for additional structural support. When carousels are triple stacked the bottom carousel columns are manufactured from Schedule 80 tubing. Support columns slip into sleeves that are integral to both the upper weldments and the floor bases. Columns are locked in position by a series of set screws (bolts) on both upper and lower sleeves.

Lower Track

The lower track is made up of 2" x 2" x 1/4" A-36 structural angle welded to similar cross-angles to form a rigid frame. These assemblies fit around and attach to the floor bases. The lower carrier bracket wheels run along the outside vertical surface of the lower track to

maintain the correct vertical alignment of the carrier. An adjustable semi-circular “nose end assembly” completes the lower track at both end of the machine. These end pieces allow proper tensioning of the lower carrier chain as well as provide a guide for the lower carrier bracket wheels as each carriers travels around the end of the machine.

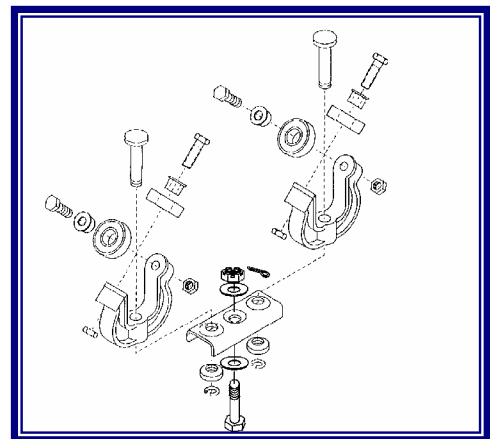
The floor bases are C4 channel with column sleeves and steel angle tabs at each end. The tabs have holes to accommodate floor anchors. Floor bases are shimmed to level before the machine is anchored.

Welding on all structural weldments is performed to meet AWS A5.18 or AWS A5.20 specifications, and all non-structural sections (plates, etc.) are either ASTM A569 hot rolled steel or ASTM A366 cold rolled steel.

Suspension System

Multi-wheel support trolley assemblies distribute the load to multiple points on the load carrying track for less wear and smoother operation.

- ❖ Each carrier supported by trolleys with four wheels each; eight support wheels per carrier.
- ❖ No maintenance trolley wheels are sealed for life with low pressure contact seals to prevent dirt penetration.
- ❖ Aluminum die-cast yokes provide lightweight, durable support for wheels and high strength carrier bolt.
- ❖ Precision chrome alloy wheels resist wear and abrasion.
- ❖ High strength load bar uses conical bearing surfaces to minimize wear.
- ❖ High strength carrier bolt secured with castle nut and safety cotter pin.
- ❖ For additional upper chain capacity, yoke pins may be replaced with high strength bolts, castle nuts and cotter pins in 3-bolt chain design.



YOKE ASSEMBLY

Carriers

Top hung, wire construction carriers place steel in tension versus compression for greater capacity at a lower cost. For enhanced load distribution, both carrier sides support the live load. The carrier sides are attached to the carrier back by integral wire loops that act as hinge points. The carrier sides are folded across the back to minimize shipping volume.

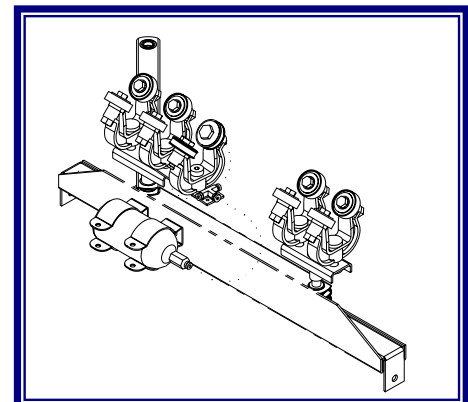
- ❖ Carrier weight is reduced compared to sheet metal construction.
- ❖ Carrier is quieter while in operation.
- ❖ Carriers and shelves are zinc-plated for longer surface wear. No paint chipping, corrosion, or contamination.
- ❖ Carriers are easy to install and remove with 4, single-bolt attachment points.
- ❖ Loaded carriers are self-supporting (free standing) when removed from the unit, for easier maintenance, carousel movement or re-configuration.

Carousel Loading: Megastar Horizontal Carousels are designed and tested to operate under severe imbalanced load conditions. Factory testing, equivalent to a minimum of one year of carousel operation, with 100% imbalanced load (all load on one side), resulted in no adverse affect on any carousel components or structure.

- ❖ No special loading constraints are required, allowing for optimum utilization of the storage cube with 100% random storage.
- ❖ No consideration needs to be given at initial loading for out of balance.

Maintenance: Megastar Horizontal Carousels are designed for low-maintenance and reliable operation at very low operating costs.

- ❖ Sealed-for-life bearings – all load wheels have sealed bearings that require no maintenance.
- ❖ Automatic Top Track Oiler (see sketch) – Oil is fed gradually and evenly to a felt-lined roller. This roller is in continuous contact with the track. See *Track Lubrication* section for details.



- ❖ Gear motor – Direct coupling to the motor ensures no adjustment or lubrication of chains or belts. The grease-packed gearbox requires only annual inspection; thus no oil to be applied and no mess.
- ❖ Warranty- Megastar offers the best warranty terms in the industry.
 - Five years/4500 hours on stainless steel guide track, support structure and trolley wheels
 - Two years on all other mechanical components
 - One year on electrical components.

Standard Specifications

Moving Structure

- ❖ Heavy-duty cast aluminum trolley yokes.
- ❖ Sealed for life, no maintenance bearing wheels.
- ❖ High strength carrier bolts with safety wired castle nut.
- ❖ Continuously connected top and bottom chain. A carrier can be removed and still safely operate the machine.

Static Structure

- ❖ All structural steel members.
- ❖ Self supporting and stackable machine structures.
- ❖ Stainless steel top track tubing.
- ❖ Standard lengths of frame sections, drive and idler ends for modular construction.
- ❖ Field adjustable upper and lower tracks for optimal machine alignment.

Drive System

- ❖ In-line, top mounted, direct drive gearmotor assemblies.
- ❖ Heavy-duty AC Variable Frequency Drive Unit.
- ❖ 80-85 fpm (41 – 46 mps) retrieval speed.
- ❖ Reducer noise level \leq 63 DB.

Motor Capacity

- ❖ Single-drive carousel capacities up to 30,000 lbs.
- ❖ Dual-drive carousel capacities up to 120,000 lbs.

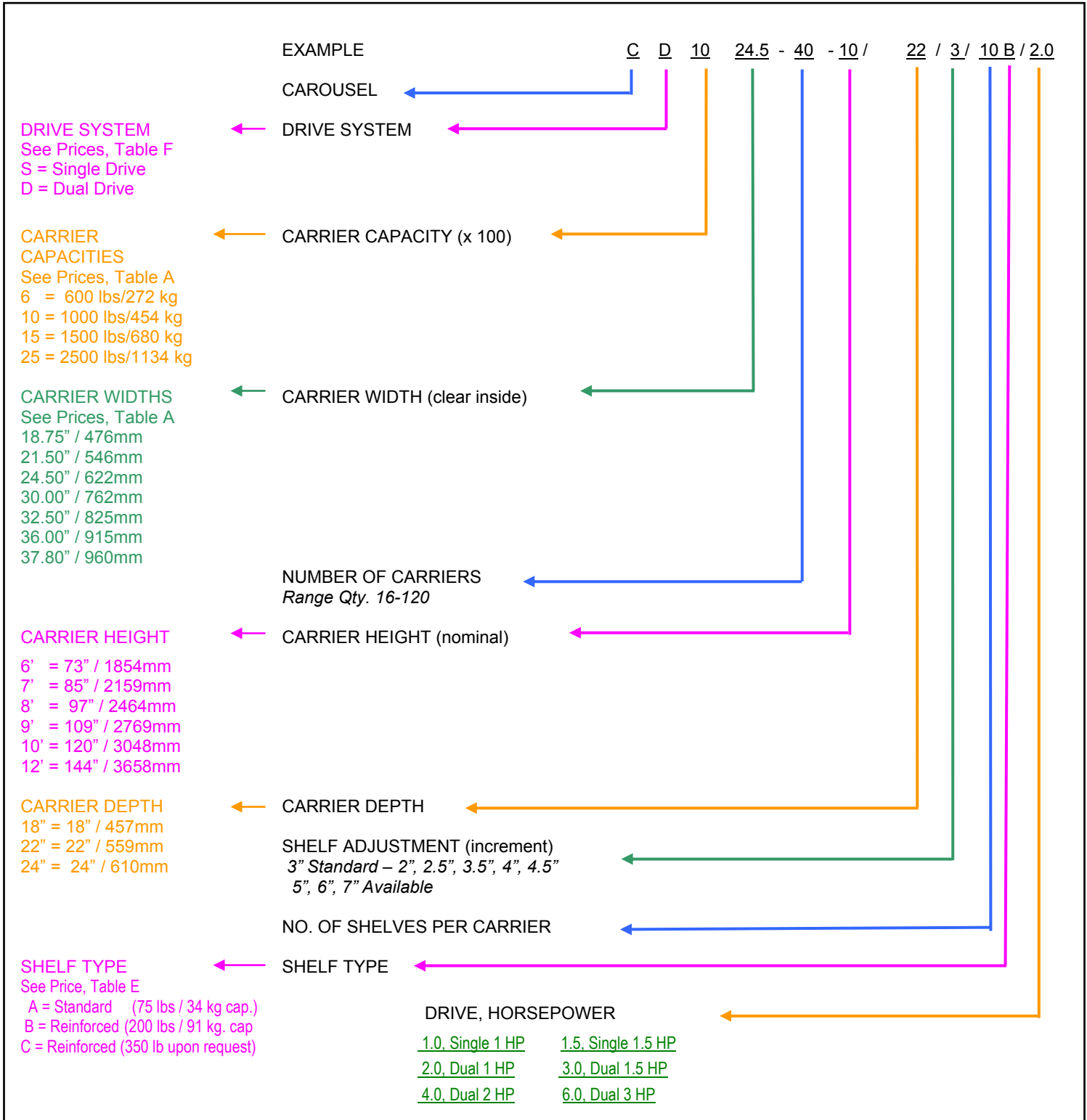
Controls

- ❖ UL Listed controls including UL-C Canadian Certification.
- ❖ PLC based.
- ❖ AC frequency inverter drive with auto tune feature.
- ❖ RCC controller for PC based applications.
- ❖ Safety circuit interfaces included.

Design and Maintenance Features

- ❖ Modular design of carousel frame, carriers and upper and lower chains allows for many standard configurations.
- ❖ Modular design for quick installation.
- ❖ Simple carrier and shelf installation.
- ❖ Stackable machine design.
- ❖ Only two lubrication points.
- ❖ Automatic Track Lubrication for reduced maintenance requirements.

Carousel Model Number Explanation

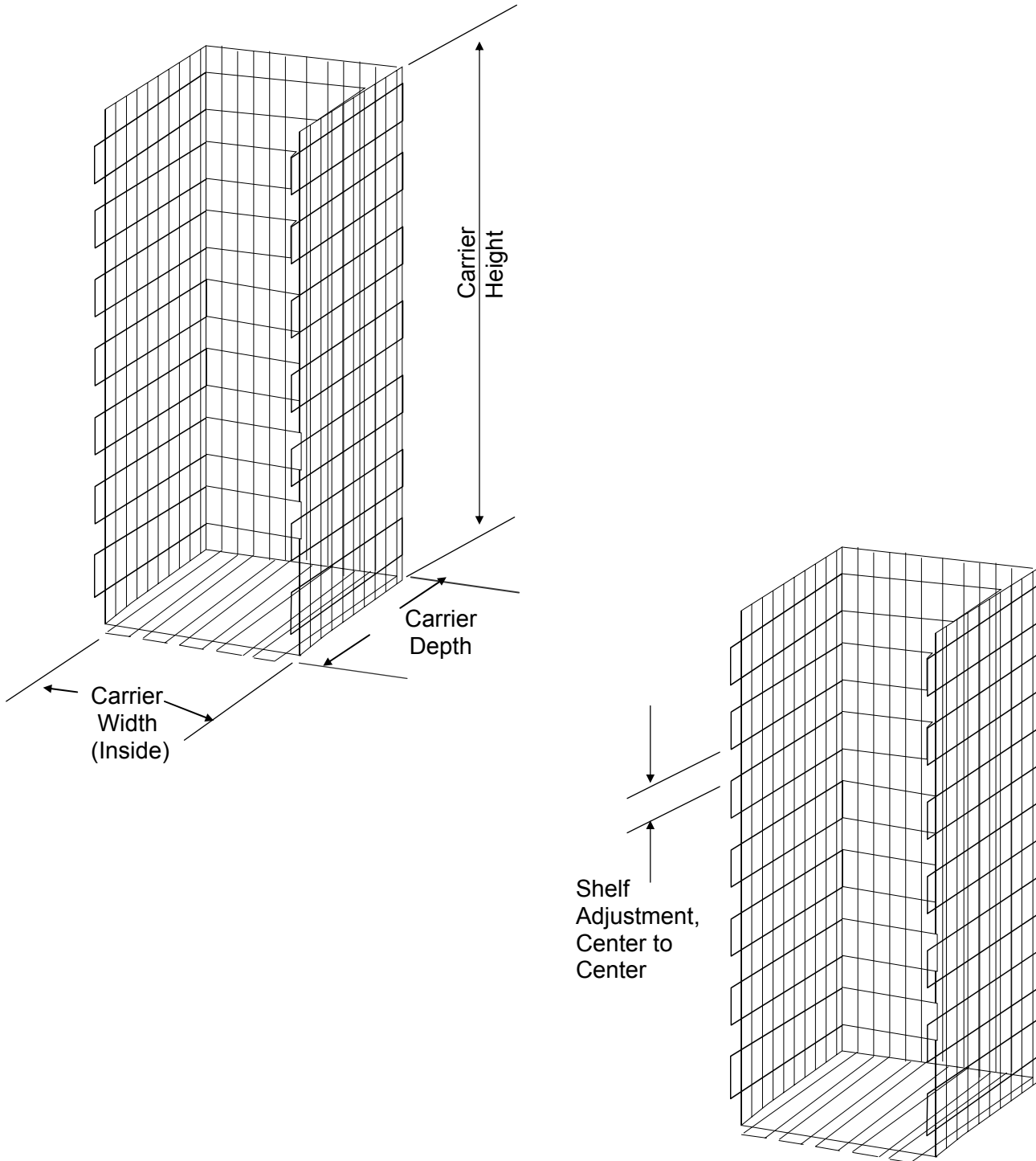


Carousel Specifications

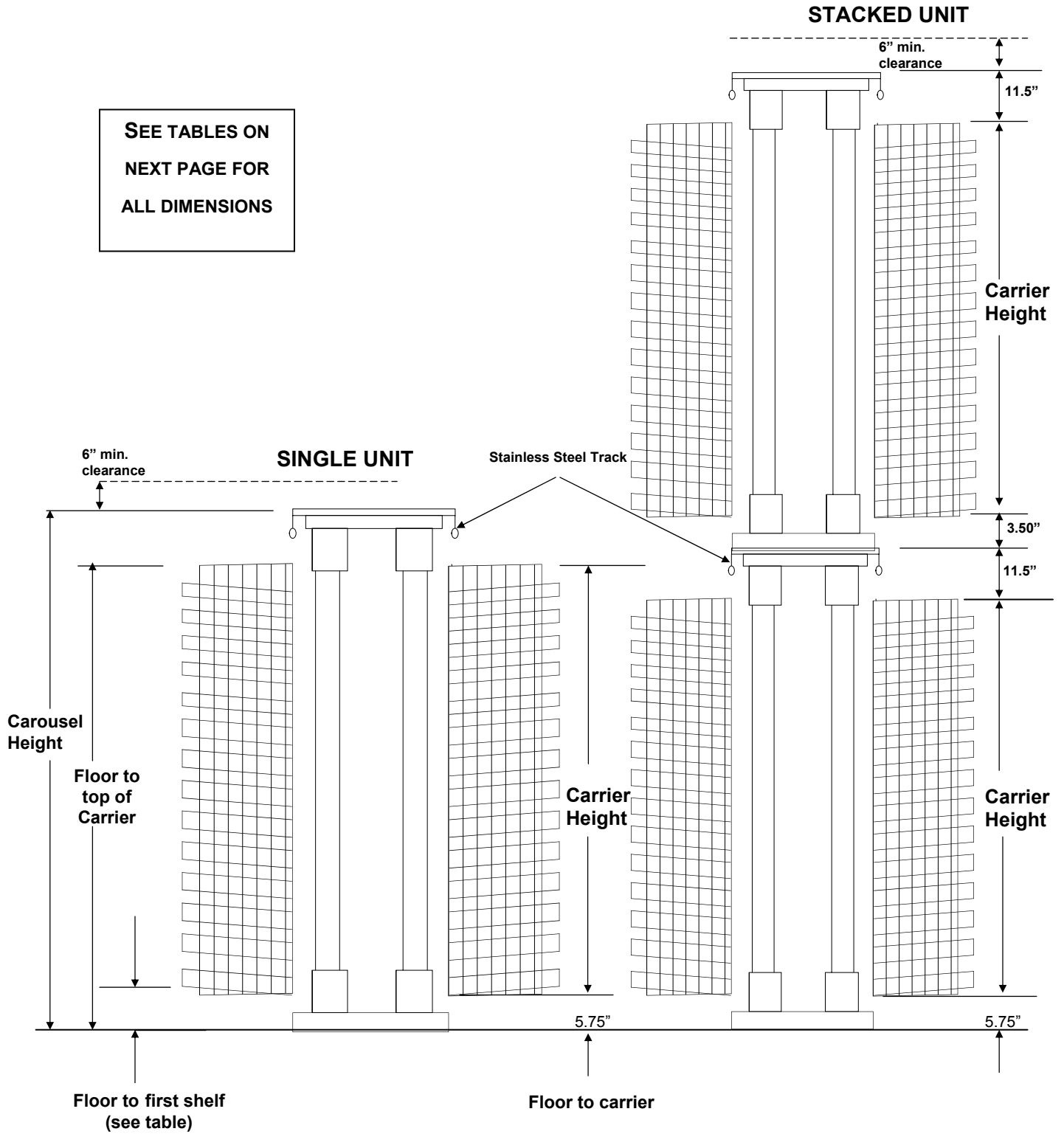
Carousel Drive Capacity	Carrier Capacity				AC Motor	Line Voltage to MCU-II	MCU Circuit Breaker	Supply Voltage @ 208/3
	lbs	kg	lbs	kg				
22500	lbs	600	1000	1500	Single 1 HP	208 VAC, 3 Phase 50 or 60 Hz ↓	7.5 A	15 A
10206	kg.	272	454	680				
30000	lbs	600	1000	1500	Single 1.5 HP		7.5 A	15 A
13608	kg.	272	454	680				
40000	lbs	600	1000	1500	Dual 1 HP		15 A	20 A
18144	kg.	272	454	680				
60000	lbs	600	1000	1500	Dual 1.5 HP		15 A	20 A
27215	kg.	272	454	680				
80000	lbs	-	1000	1500	Dual 2 HP		20 A	30 A
36287	kg.	-	454	680				
120000	lbs	-	1000	1500	Dual 3.0 HP	25 A	30 A	
54431	kg.	-	454	680				

RCC-II Power: 115 VAC/1 Phase/50 Hz/0.15A/20W
or 220VAC/1 Phase/50 Hz/0.08A/20W

Carrier Capacity (per carrier)								Shelf Adjustment (center to center increment)		
lbs.	600	1000	1500					(in.)	(mm)	
kg.	272	454	680					Optional	2.0	51
								Optional	2.5	64
								Standard	3.0	76
								Optional	3.5	89
								Optional	4.0	102
								Optional	4.5	114
								Optional	5.0	127
								Optional	6.0	152
								Optional	7.0	178
								Shelf Capacity- (see note)		
									Lbs.	Kg.
								A Shelf	75	34
								B Shelf	200	91
Carrier Width (Clear inside dimension)								NOTE: Shelf capacity refers to a uniformly distributed shelf load; point loading invalidates published capacities. All dimensions are in inches/mm with the exception of the carrier nominal height.		
In.	18.75	21.5	24.5	30	32.5	36	37.8			
mm.	476	546	622	762	826	914	960			
Carrier Height (nominal dimension)										
ft.	6	7	8	9	10	12				
m.	1.83	2.13	2.44	2.74	3.05	3.66				
Actual Heights in inches										
In.	73	85	97	109	120	144				
Carrier Depth										
In.	18	22	24							
mm	457	559	610							

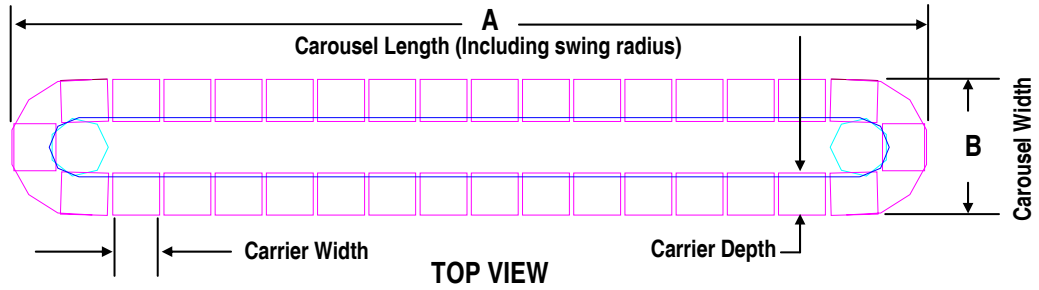


**SEE TABLES ON
NEXT PAGE FOR
ALL DIMENSIONS**



Carrier Heights	Ft.	6	7	8	9	10	12
Minimum Overhead Clearance Allowed	In.	6	6	6	6	6	6
Overall Height	In.	90.25	102.25	114.25	126.25	137.25	161.25
Floor to Top of Carrier	In.	78.78	90.75	102.75	114.75	125.75	149.75
Carrier Height	In.	73	85	97	109	120	144
Floor to First "A" Shelf							
18" deep	In.	10.25					
22" deep	In.	10.75					
24" deep	In.	11					
A Shelf Thickness	In.	.50					
Floor to First "B" Shelf							
18" (457mm) deep	In.	10.25					
22" (559mm) deep	In.	10.75					
24" (610mm) deep	In.	11					
B Shelf Thickness	In.	.80					

Note: All shelves, regardless of model or depth, are inclined at 6°.



Number of Carriers	A = Overall Length for Carrier width and number (Based on 18" carrier depth)						
	18.75" Wide	21.5" Wide	24.5" Wide	30" Wide	32.50" Wide	36" Wide	37.8" Wide
16	15' - 6 1/4"	17' - 5"	19' - 3 3/4"	23' - 8 3/4"	25' - 4 1/2"	27' - 10"	28' - 9"
18	17' - 3 1/4"	19' - 5"	21' - 6 1/2"	26' - 5 3/4"	28' - 4"	31' - 1"	32' - 1"
20	19' - 1/4"	21' - 5"	23' - 9 1/4"	29' - 2 3/4"	31' - 3 1/4"	34' - 4"	35' - 5 1/4"
22	20' - 9 1/4"	23' - 5"	26' - 0"	32' - 0"	34' - 2 3/4"	37' - 7"	38' - 9 1/2"
24	22' - 6 1/4"	25' - 5"	28' - 2 3/4"	34' - 9"	37' - 2"	40' - 10"	42' - 1 1/2"
26	24' - 3 1/4"	27' - 5"	30' - 5 1/2"	37' - 6"	40' - 1 1/2"	44' - 1"	45' - 5 3/4"
28	26' - 1/4"	29' - 5"	32' - 8 1/4"	40' - 3"	43' - 1"	47' - 4"	48' - 10"
30	27' - 9 1/4"	31' - 5"	34' - 11 1/4"	43' - 1/4"	46' - 1/4"	50' - 7"	52' - 2"
32	29' - 6 1/4"	33' - 5"	37' - 2"	45' - 9 1/4"	48' - 11 3/4"	53' - 10"	55' - 6 1/4"
34	31' - 3 1/4"	35' - 5"	39' - 4 3/4"	48' - 6 1/4"	51' - 11"	57' - 1"	58' - 10 1/4"
36	33' - 1/4"	37' - 5"	41' - 7 1/2"	51' - 3 1/4"	54' - 10 1/2"	60' - 4"	62' - 2 1/2"
38	34' - 9 1/4"	39' - 5"	43' - 10 1/4"	54' - 1/2"	57' - 10"	63' - 7"	65' - 6 3/4"
40	36' - 6 1/4"	41' - 5"	46' - 1"	56' - 9 1/2"	60' - 9 1/4"	66' - 10"	68' - 10 3/4"
42	38' - 3 1/4"	43' - 5"	48' - 3 3/4"	59' - 6 1/2"	63' - 8 3/4"	70' - 1"	72' - 3"
44	40' - 1/4"	45' - 5"	50' - 6 1/2"	62' - 3 3/4"	66' - 8"	73' - 4"	75' - 7"
46	41' - 9 1/4"	47' - 5"	52' - 9 1/4"	65' - 3/4"	69' - 7 1/2"	76' - 7"	78' - 11 1/4"
48	43' - 6 1/4"	49' - 5"	55' - 0"	67' - 9 3/4"	72' - 7"	79' - 10"	82' - 3 1/2"
50	45' - 3 1/4"	51' - 5"	57' - 2 3/4"	70' - 7"	75' - 6 1/4"	83' - 1"	85' - 7 1/2"
52	47' - 1/4"	53' - 5"	59' - 5 1/2"	73' - 4"	78' - 5 3/4"	86' - 4"	88' - 11 3/4"
54	48' - 9 1/4"	55' - 5"	61' - 8 1/4"	76' - 1"	81' - 5"	89' - 7"	92' - 4"
56	50' - 6 1/4"	57' - 5"	63' - 11 1/4"	78' - 10"	84' - 4 1/2"	92' - 10"	95' - 8"
58	52' - 3 1/4"	59' - 5"	66' - 2"	81' - 7 1/4"	87' - 4"	96' - 1"	99' - 1/4"
60	54' - 1/4"	61' - 5"	68' - 4 3/4"	84' - 4 1/4"	90' - 3 1/4"	99' - 4"	102' - 4 1/4"
62	55' - 9 1/4"	63' - 5"	70' - 7 1/2"	87' - 1 1/4"	93' - 2 3/4"	102' - 7"	105' - 8 1/2"
64	57' - 6 1/4"	65' - 5"	72' - 10 1/4"	89' - 10 1/2"	96' - 2"	105' - 10"	109' - 3/4"
66	59' - 3 1/4"	67' - 5"	75' - 1"	92' - 7 1/2"	99' - 1 1/2"	109' - 1"	112' - 4 3/4"
68	61' - 1/4"	69' - 5"	77' - 3 3/4"	95' - 4 1/2"	102' - 1"	112' - 4"	115' - 9"
70	62' - 9 1/4"	71' - 5"	79' - 6 1/2"	98' - 1 1/2"	105' - 1/4"	115' - 7"	119' - 1 1/4"
72	64' - 6 1/4"	73' - 5"	81' - 9 1/4"	100' - 10 3/4"	107' - 11 3/4"	118' - 10"	122' - 5 1/4"
74	66' - 3 1/4"	75' - 5"	84' - 0"	103' - 7 3/4"	110' - 11"	122' - 1"	125' - 9 1/2"
76	68' - 1/4"	77' - 5"	86' - 2 3/4"	106' - 4 3/4"	113' - 10 1/2"	125' - 4"	129' - 1 1/2"
78	69' - 1 1/4"	79' - 5"	88' - 5 1/2"	109' - 2"	116' - 10"	128' - 7"	132' - 5 3/4"
80	71' - 6 1/4"	81' - 5"	90' - 8 1/4"	111' - 11"	119' - 9 1/4"	131' - 10"	135' - 10"
82	73' - 3 1/4"	83' - 5"	92' - 11 1/4"	114' - 8"	122' - 8 3/4"	135' - 1"	139' - 2"
84	75' - 1/4"	85' - 5"	95' - 2"	117' - 5"	125' - 8"	138' - 4"	142' - 6 1/4"
86	76' - 9 1/4"	87' - 5"	97' - 4 3/4"	120' - 2 1/4"	128' - 7 1/2"	141' - 7"	145' - 10 1/2"
88	78' - 6 1/4"	89' - 5"	99' - 7 1/2"	122' - 11 1/4"	131' - 7"	144' - 10"	149' - 2 1/2"
90	80' - 3 1/4"	91' - 5"	101' - 10 1/4"	125' - 8 1/4"	134' - 6 1/4"	148' - 1"	152' - 6 3/4"

Obtain lengths for odd number of carrier machines from the Product Order Form. Odd number of carriers are available in two-pitch machines – 18.75", 21.5" or 24.5". Continued on next page.



Carrier Depth		Adjustment to Overall length "A" for carrier depth. (18" depth assumed above)					
	18.75" Wide	21.5" Wide	24.5" Wide	30" Wide	32.50" Wide	36" Wide	37.8" Wide
18"	None	None	None	None	None	None	None
22"	+8	+8	+8	+8	+8	+8	+8
24"	+12	+12	+12	+12	+12	+12	+12

Carrier Depth		To determine "B", overall width, of a specified carousel, use the following table:					
	18.75" Wide	21.5" Wide	24.5" Wide	30" Wide	32.50" Wide	36" Wide	37.8" Wide
18"	59 – 1/2"	58"	63"	59"	61"	60 – 1/2"	61"
22"	67 – 1/2"	66"	71"	67"	69"	68 – 1/2"	69"
24"	71 – 1/2"	70"	75"	71"	73"	80 – 1/2"	81"



AC CONTROLS SPECIFICATIONS

Basic Controls Package

The basic controls package contains the motor controller and the sensors to allow the carousels to be operated with optional control input devices.

INCLUDES:

- ❖ UL listed MCUII (motor control unit) sized appropriately for the selected drive horsepower.
- ❖ Proximity sensor with 30 ft hardwired cable - shipped with the MCU-II, and mounted in the field.
- ❖ (1) MCUII to MCUII cable for connecting additional machines – 5' standard length

OPTIONAL:

- ❖ Cable: MCUII to MCUII - 10', 15', 25' and 50'. These cables have pre-wired connectors at both ends that plug directly into the MCU-IIs.
- ❖ Cable: Proximity Sensor - 40', 50', 75', 100', 125' and 150'. Since the cable is hard-wired into the sensor, optional lengths, if required, must be specified on the initial order.
- ❖ Electrical power cables from the gear motors to the MCUII are not included, and should be ordered and installed to local code.

UL Listed Megastar Carousel Controller (RCC-II)

The RCCII allows the use of a PC loaded with computer software to control a group (pod) of carousels. The RCCII utilizes a powerful, industrial-grade central processing unit. One RCCII is required per workstation and can control up to 4 carousels. It utilizes an RS-232 connection to the pod PC.

Under any of the following instances, the RCCII is required:

- ❖ To interface a workstation to a PC and software (*Fastpic*™ or third-party).
- ❖ To allow control by more than one PHCII in a workstation.
- ❖ For queuing or sorting handheld controller inputs.

INCLUDES:

- ❖ UL listing
- ❖ RCCII with host interface capability
- ❖ (1) RCCII to MCUII cable per RCCII – 5'. The RCCII is daisy-chained to one MCUII, which is daisy-chained to the remainder.
- ❖ (1) RS-232 RCCII to PC (host) cable per RCCII – 25'

OPTIONAL:

- ❖ Cable: RCCII to PC cable - 10', 15' and 50'. RS232 protocol demands that the RCC-II to PC cable should never be more than 50'.
- ❖ Cable: RCCII to MCUII cable - 10', 15', 25' and 50'

Portable Handheld Controller (PHCII)

The Portable Hand Controller (PHCII) connects to the MCUII to create a carousel control system with local sequencing capability. This device is also used to set communications and control parameters, trouble shoot the control system and adjust various optional features such as screen saver and audible beeper. When using queued memory feature, as many as 99 carrier locations per carousel can be entered at one time into the memory, when coupled with an RCCII. At the touch of a button, the carousel advances to the next queued location, automatically selecting the shortest route each time for maximum productivity.



The Portable Hand Controller (PHCII) is a lightweight portable unit of molded lexan, approx. 8-1/2" (216mm) long x 3-1/2" (89mm) wide, and 2" (51mm) thick. It is designed to withstand the handling and environmental conditions encountered in most industrial and warehousing applications. It's 4 lines x 20 characters display is designed to be readable at distances several feet away, not just in the hand. Several mounting kit options are available including Velcro hanger, magnetic hanger or screw fastened sheet metal hangers.

The PHC-II has a choice of two screens:

- ❖ **LCD - Liquid Crystal Display.** This has **red characters on a white background.**
- ❖ **VFD - Vacuum Fluorescent Display.** This has **black text on a translucent green background.** This is the most commonly used option.

The standard 20-button entry keyboard includes:

- ❖ 0-9 numerals
- ❖ Arrow keys to rotate carousels left or right
- ❖ Function keys to access and set system parameters or troubleshoot the control system
- ❖ Memory keys for entering data for sequential picks

Typically one PHCII is used per workstation, up to a maximum of four carousels. If the application requires use of the queued memory feature or more than one PHCII is required per workstation (e.g., the application has operators at both ends of the carousel), then an RCCII needs to be ordered for each workstation.

INCLUDES:

- ❖ Portable Handheld Controller.
- ❖ UL Listing.
- ❖ (1) standard PHCII to MCU cable – 59’.

OPTIONAL:

- ❖ Additional Cable Length: PHCII to MCUII - 50’, 100’ and 150’.
- ❖ Do not exceed a total length of 159’ between MCU and PHC.

Optional Bi-Directional Footswitch

A bi-directional foot switch provides manual control to rotate the carousel in either direction. To meet OSHA safety regulations, a metal guard is placed over the pedal to reduce the opportunity of accidental activation of the carousel.

Stepping on the left or right side of the foot switch rotates the carousel to the left or right respectively. When the operator lifts their foot, the carousel stops at the next carrier location.

INCLUDES:

- ❖ Bi-directional Footswitch
- ❖ (1) 50’ standard Footswitch to MCUII cable, hard wired to the footswitch

OPTIONAL:

- ❖ Longer Cable Lengths: 100’, 150’
- ❖ Since the cable is hard-wired into the footswitch, optional lengths must be specified on the initial order.

MEGASTAR'S SAFETY STANDARDS

Megastar is an active participant in creating and endorses the upcoming ANSI MH24.1 Horizontal Carousel Safety Standard. This standard places obligations on manufacturers, dealers and customers with the intent of achieving the following objectives:

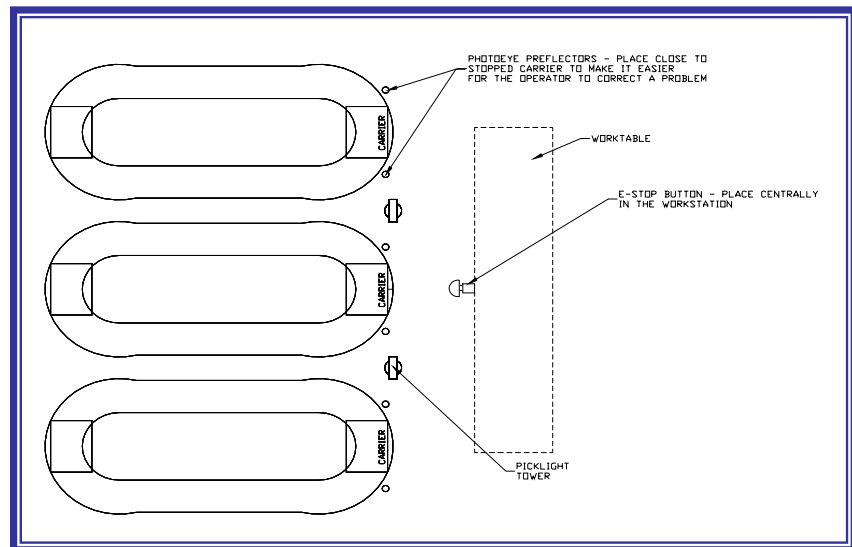
- ❖ Minimize risk for all involved, users, dealers and manufacturers, in implementing horizontal carousel applications
- ❖ Provide a basic standard for the safe usage, operation and maintenance of horizontal carousels
- ❖ Educate users and distribution channels about the need for minimum training levels for carousel operators and users
- ❖ Provide a benchmark to outline responsibilities from a legal perspective
- ❖ Prevent price undercutting by eliminating safety devices and circuits

Megastar is the first manufacturer to incorporate the new MHI Safety Standards into carousel controls. These standards are required for all of orders placed as of August 1, 2000.

What does this mean when ordering units?

Order a minimum of

- ❖ Two (2) vertical reflective photoeyes per carousel if accessing the carousel at the front of the machine. If accessing both ends, use four (4) sensors.
- ❖ One (1) Emergency Stop Button per Workstation
- ❖ One (1) E-Stop Interface Module per Workstation
- ❖ One (1) F-Stop Interface Module per Workstation



For your convenience, these are automatically added through the Product Order Form. The following drawing illustrates the locations of the required devices.

UL LISTED EMERGENCY STOP CIRCUITRY

The E-stop circuitry is provided should an abnormal condition exist which requires a quick system shutdown. The circuits are configured to stop all carousels in the operator's workstation. It is recommended that carousels in line-of-sight workstations be stopped also.

The E-Stop button should be centrally located within the carousel workstation for easy access from any point in that workstation, bearing in mind the operator's motion (path) while executing their normal functions. This device should only be used for perceived or actual emergencies. It should not be used to stop a system to correct operational mistakes or for other non-emergency circumstances. This ensures that proper supervisory attention is given to emergency situations.

E-Stop Button/E-Stop Interface Module:

The E-Stop Button and E-Stop Interface Module, plus cables, make up the emergency stop safety circuit. The E-Stop module is usually mounted next to the MCU's. One or more E-Stop buttons, in series, are cabled to the module. The module, in turn, is cabled to each MCU (4 maximum) for the carousels in the workstation.

The emergency stop button is a large red mushroom button mounted on a small enclosure, centrally located within the operator's workstation. The switch action is "maintained", meaning that the switch stays "in" when pushed. Turn the button until it pops out to reset the E-Stop condition for the carousels. Pushing the button stops all motion of any carousel to which it is wired by immediately removing power to the motors.

INCLUDES:

- ❖ E-Stop Interface Module with UL Listing.
- ❖ (1-4) 10' E-Stop Module to MCUII cables, one per MCU, up to 4 MCU's.
- ❖ E-Stop Button with UL Listing.
- ❖ (2) 50' E-Stop Button to E-Stop Module cables.

OPTIONAL:

- ❖ Longer Cables: E-Stop Module to MCUII cables - 50' and 100'.
- ❖ Additional E-Stop Buttons
- ❖ Longer Cables: E-Stop Button to E-Stop Module - 100' and 150'.

F-STOP CIRCUITRY SPECIFICATIONS

F-Stop Interface Module

This circuitry stops carousels quickly when activated by photo sensors and other similar devices. The F-Stop Interface Module, which plugs into each MCUII in a workstation, is the central component of this circuit. Breaking any sensor in a workstation stops all carousels in that workstation.

Resetting the carousels can be carried out in a number of ways. Resets can be done by a Key on PHC-II keyboard, a reset button on each MCU-II, or the Host computer keyboard.

INCLUDES:

- ❖ F-Stop Interface Module, with capacity for up to (8) photoeyes and (4) MCUIIs
- ❖ 10' length of F-Stop Module to MCUII cable per MCUII.

OPTIONAL:

- ❖ (1) 6' length of F-Stop Module to F-Stop Module cable.
- ❖ (1) 10' length of F-Stop Module to MCU-II cable, per MCUII

Vertical Photoeyes:

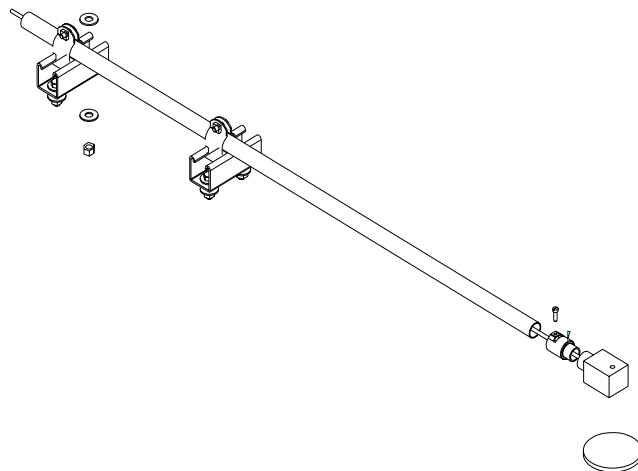
The Vertical Photo Eye is a product protection device, which includes one retro reflective sensor at the top and one reflector at the bottom of the carousel. These components are mounted vertically next to the carousel. Each photoeye should be positioned such that it will detect any product that protrudes from the carousel and create a pinch point between the rotating carriers and any obstacle (including Pick Light Towers, building columns, etc.). The photoeyes stop carousel rotation when their light beam is broken. No carousel in the workstation will travel until the operator corrects the obstruction and resets the carousel.

When ordering photoeye sets, specify two sets per carousel access position. If the operator is to access the carousel at one end, select 'F' on the sheet for front access only. If the operator is to access both ends of the carousel, select 'B' on the sheet to select one pair of photoeyes for the front and one pair for the rear. At each position, one eye protects for clockwise rotation, and the other for counter-clockwise rotation.

Photoeyes are installed on both sides of each stopping position close to the carousel. Typically the gap between the photoeye and the carousel carrier ranges between 2" and 6".

INCLUDES:

- ❖ Retro-reflective photoeye.
- ❖ 3" diameter reflector.
- ❖ 75' of cable hard-wired into the photoeye.
- ❖ Mounting bracket and hardware for top mounting to carousel frame.



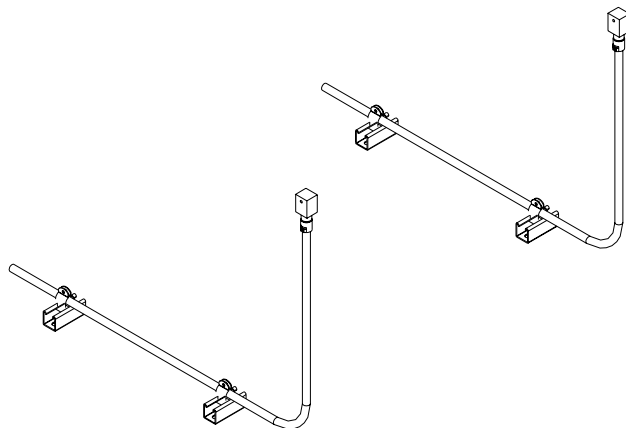
Horizontal Photoeye:

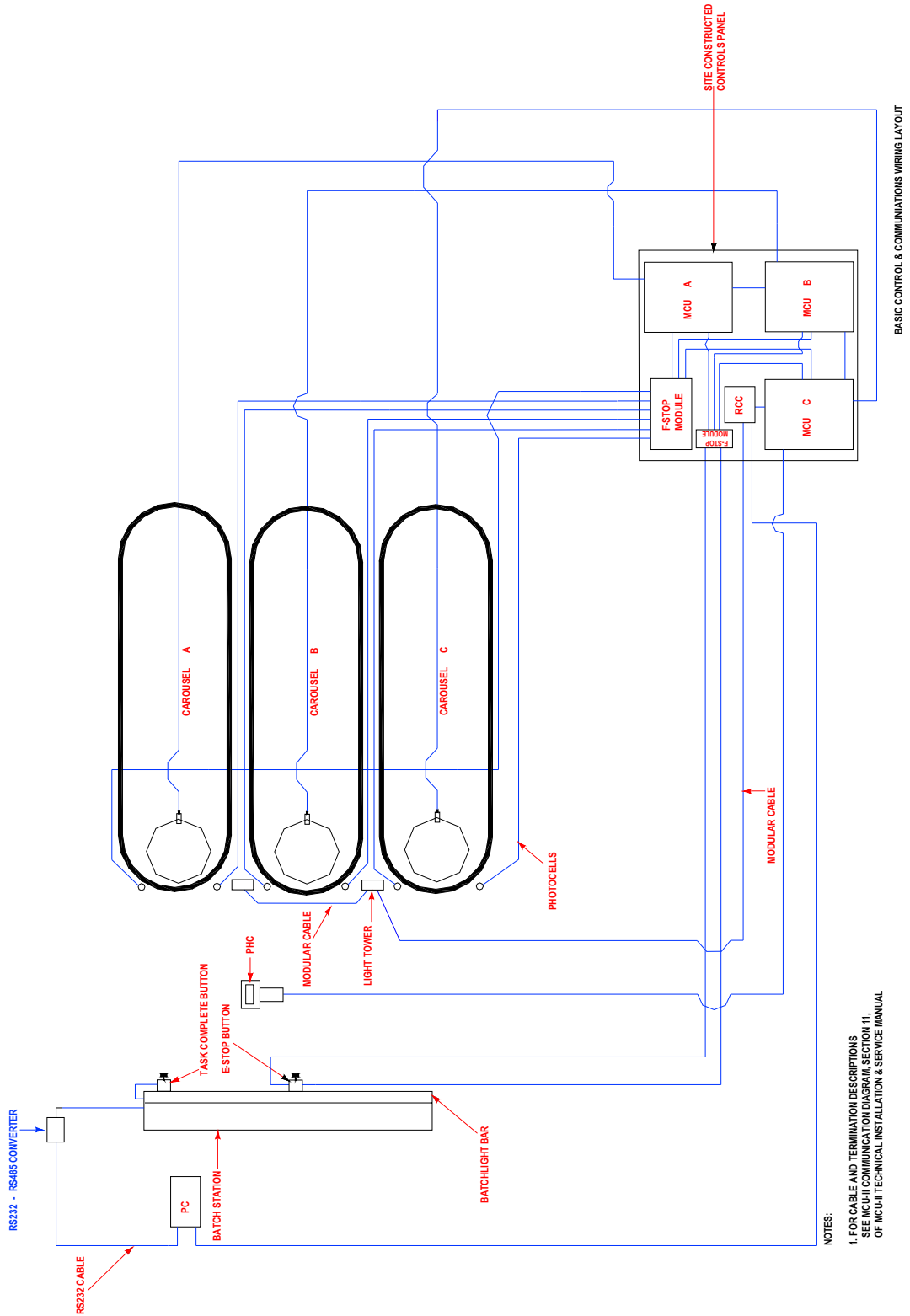
This photo beam kit includes one transmitting and one receiving sensor, mounted horizontally along side the carousel, approximately three feet off the floor. These sensors are used to stop carousel rotation if an object such as a pick cart or pallet load of product breaks the beam. When installed properly the full length of the carousel is protected from intrusion. If this beam is broken, the carousel will not function until the operator resets the carousel controls. The sensors should be positioned a short distance from the face of the rotating carriers. It is recommend that each sensor mount be physically protected to maintain sensor alignment

Include a drawing or sketch of the photoeye layout in the workstation. Specify on the order form the gap you wish between the photo sensors and the faces of the carriers. This typically ranges between 2" and 6".

INCLUDES:

- ❖ Emitter photoeye.
- ❖ Receiver photoeye.
- ❖ 100' of cable hard-wired into each sensor.
- ❖ Set of brackets to mount to the floor.





NOTES:
1. FOR CABLE AND TERMINATION DESCRIPTIONS
SEE MCU-I COMMUNICATION DIAGRAM, SECTION 11,
OF MCU-I TECHNICAL INSTALLATION & SERVICE MANUAL