



HARKEN®

NEW RADIAL WINCH LINE

Radial

REVOLUTION



HARKEN ITALY'S TECHNICAL
DIRECTOR ANDREA MERELLO
TELLS THE INSIDE STORY
BEHIND THE DEVELOPMENT
OF RADIAL WINCHES

Editor's Note: Harken entered the winch business in 1987, adapting original Barbarossa designs for Harken's standard line and adding a pure Grand Prix racing line. Grand Prix racers have always demanded constant innovation, but most sailors just wanted solid, efficient winches that would last for 30 years. Now sailors and boatbuilders want all that and more—faster installations, easier maintenance, and simpler upgrades.

“We started from a blank sheet of paper, addressing the needs of specific types of sailors.”

— Andrea Merello
Technical Director

A Blank Sheet of Paper

Radial winches were designed from the deck up with three key ideas in mind: safety and long-lasting performance, streamlined installations, and hydraulic and electric upgrades as integral parts of the design rather than afterthoughts. We started from a blank sheet of paper, addressing the needs of specific types of sailors. For example, racers mainly want the most

power for the lightest weight. A cruiser with a child on the other hand asks, “Wait a minute, if my kid puts hands on the winch while the electric power is turning it ...” They are more concerned with safety.



Radial REVOLUTION



New Product, New Process

No winch line has ever been designed with yacht builders in mind. No one asked, "What can we do to help boatbuilders who assemble in bigger quantities?" That's because if you went to a boatbuilding yard 10 years ago, they weren't using the highly efficient "lean" assembly systems used in automotive companies. These days, there's a bigger focus on the time required to install a winch, the weight and ease-of-handling from a worker's point of view, and the complexity of the assembly process.

Grip with a Twist

The grip is one of the most critical areas of a winch. With a high-friction drum there will be more line wear, so designers must balance the need for controlled easing with line longevity. We also have to consider that the winch is interfacing with a product we don't make—we needed to find a grip that performed as well with high-tech line as with older cordage. So while we were happy with the sandblasting and knurling we had before, we wanted to find out if there was more we could do.

The new grip is very different from other winches with grooves or ribs. Other winches tend to push the line wraps up when easing. The Radial grip works more like a screw, driving the wraps down when easing to keep them on the part of the drum where you have the best control.

"The Radial grip works more like a screw, driving the wraps down when easing [for] the best control."

— Andrea Merello
Technical Director



20 SERIES

35 SERIES

40 SERIES

46 SERIES



What Lean Manufacturing Means For You

By Adriano Rubinaccio
Production Director

When we started talking about this project our aim was to use it as an opportunity to dramatically improve not just the product, but also the process. We wanted to actually change the company's manufacturing culture so we could increase production speed and eliminate waste while maintaining—even improving—the level of quality. We adopted "lean manufacturing" principles to increase speed and implemented a very simple "zero defect" approach. No defective components or products are allowed to move to the next step in the process. Any worker can stop a product moving through the process if a problem appears, and every worker is directly responsible for customer satisfaction.

Winch Abuse

Each size of each winch had to pass a minimum of 13 tests covering things such as wet and dry line grip, pulling power versus number of wraps, stress deformation, ease of servicing, and safety. The most grueling test was the endurance test, where our parameter was to have little to no wear after thousands of nonstop pulls at the Maximum Working Load.

Combating Corrosion

Extensive testing helped us determine weak points for corrosion, where we needed to either replace or strengthen the materials we were using. We even removed the drum and lubrication for certain tests to see how well the internal components resisted corrosion from saltwater spray. The results of these tests are why we're using more stainless and one of several reasons we use composites in Radials. For example, the extremely strong "metal replacement" material we use in the roller bearings is completely nonreactive to saltwater and most chemicals, has very good wear and abrasion resistance under tremendous loads, doesn't require lubrication, and doesn't gall or seize. Its low friction and hardness properties make it ideal for high-efficiency bearing systems.

The Future

"No comments! No comments!" I can't go into details of course, but I can say we designed the Radial to be flexible and may add more options for end customers. Beyond the Radial, we're working on some totally new ideas at Harken for needs that aren't addressed by current winches. The prototypes haven't completed testing yet, but keep an eye out in the upcoming months.

"We implemented a very simple 'zero defect' approach."

— Adriano Rubinaccio
Production Director

Winch #001

Product tracking is one benefit of the new process. Every molded component has a batch number, allowing for much tighter quality control. In addition, each finished product has a serial number (#001 is already in the museum). Customers calling in for support benefit directly because we can access very specific information on that customer's winch.



Complete Radial Line: aluminum and chrome; plain-top and self-tailing; electric and hydraulic; UniPower; Quattro

Radial® Winches

POWERFUL, EFFICIENT, DEPENDABLE

We have reached a new level of performance with the introduction of our Radial Winch line. Details you will like include reduced wear on the line: the gripping surfaces of Radial Winches are shaped and do not depend on friction to hold the line. Also, we've completely covered the winch tops so fingers and clothing don't get caught in moving parts. Seasonal maintenance is now exceptionally easy—the top lifts out as a single unit, making reassembly quick and mistake-free.



DETAILS MAKE THE DIFFERENCE

MULTIPLE STYLES AND FINISHES

Radial winches are available in aluminum alloy and chrome. Choices include 1-, 2-, and 3-speed self-tailing or plain-top styles; and manual, electric, or hydraulic drives.

INTEGRATED STRIPPER ARM

The strong, one-piece stripper arm completely covers the winch top for a stable platform that prevents fingers and clothing from catching in moving parts—an important safety feature, particularly when operating powered winches. The arm can be adjusted to multiple positions after the winch is mounted, and is shaped to smoothly feed line into and out of the self-tailing jaws.

LIGHTWEIGHT, HIGH-STRENGTH MATERIALS

Composite roller bearings and bushings reduce friction under load, have excellent corrosion resistance, and don't require lubrication.

Snap-fit design keeps bearings captive in high-strength Delrin® cage when drum is removed for maintenance.

Load-carrying gears and pins are 17-4PH stainless steel for strength and durability.

Weight savings of 25 to 50 percent compared to the Classic Harken line.

EASY TO SERVICE AND MAINTAIN

Winches can be disassembled and serviced on deck. The socket, washer, and screw-top snap-fit together to simplify maintenance and for mistake-free assembly.

Installation manuals and parts lists are available online at www.harken.com.

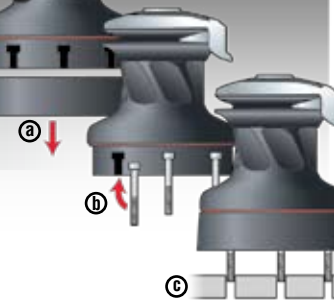
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2



3



1. Power-Grip Jaws

Composite self-tailing jaws of long-glass fiber are shaped for easy line entry and optimum gripping power.

The spring-loaded upper jaw adjusts under line pressure to accept a variety of line sizes. Teeth grip evenly with or without load.

2. Radial Shaped Surface Grip

The drum's gripping surface is shaped for each winch size and drum material and features diagonal ribs (rather than textured abrasive materials) to maximize gripping power and greatly reduce line wear. When easing, the angle of the ribs stops line from rising, preventing overrides and providing a smooth controlled release as the line exits the winch.

3. Quick Installation

Patent-pending stud-bolt mounting system allows one person to quickly install a winch without removing the drum.

- Snap off the skirt at the base of the winch.
- Slide bolts through the slots in the winch base and snap the plastic skirt back on.
- Place the stud bolts into the predrilled holes on the deck and tighten from belowdeck.

Ordering Winches

1. Choose Drum Material, Speed & Style

Aluminum: Aluminum Radial winches in 1-, 2-, and 3-speed self-tailing or plain-top.

Aluminum Classic single-speed, plain-top winches in sizes 6 and 8; 2- and 3-speed self-tailing winches sizes 980 and up in aluminum or aluminum/stainless.

Chrome: Chrome Radial winches feature chrome drums with black composite bases and tops; 1-, 2-, and 3-speed self-tailing.

All-chrome Classic winches have chrome bases, drums, and tops; 1-, 2- and 3-speeds; self-tailing or plain-top.

Stainless Steel: Stainless steel winches have stainless bases, drums, and tops; 2-, and 3-speed self-tailing; 4-speed winches in some larger sizes.

Bronze: Bronze winches in 1-, 2- and 3-speeds; self-tailing or plain-top styles.

Carbon Fiber: Carbon fiber winches in 2- and 3-speed self-tailing or top-cleating.

To order large cruising, Megayacht, and Grand Prix racing winches, please contact Harken.

Powered Winches: Choose electric or hydraulically driven winches and components. To order hydraulic winches, please contact Harken.

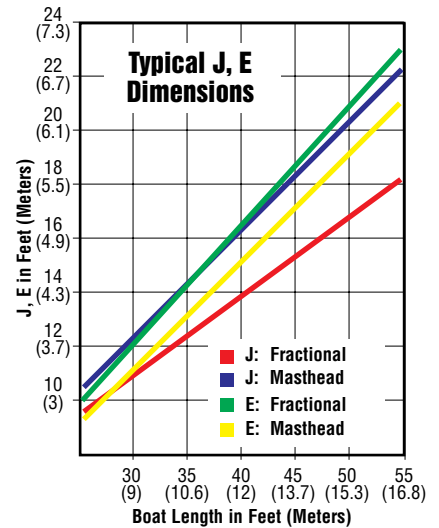
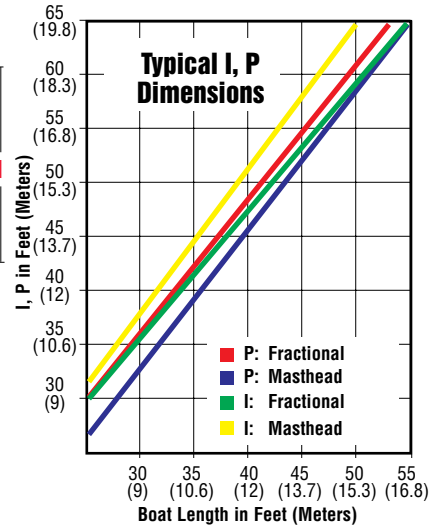
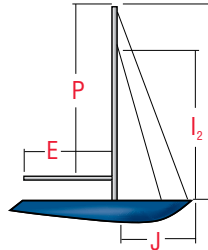
2. Determine size

The **Sizing Chart** selects winches for different applications and rig dimensions. If unsure of the dimensions, use the **Typical Dimensions** graphs. To order large Grand Prix and Megayacht winches, please contact Harken.

3. Choose Ball Bearing Handle

Plain or lock-in handles in chromed bronze, bronze and aluminum; Speedgrip and Standard styles in 8- and 10-inch (203- and 254-mm) lengths.

Rig Dimensions



Sizing Chart

Winch size	Genoa				Mainsail						Spinnaker						Staysail	
	Sheet		Halyard		End-boom mainsheet		Halyard		Reef		Sheet		Halyard		Topping lift/ foreguy		Halyard	
	Max sail area 100% foretriangle (I x J x .5)		Max I		4:1 Sheet max sail area (P x E x .5)		Max P		Max P		Max sail area (I x J x 1.8)		Max I		Max I		Max I ₂	
	ft ²	m ²	ft	m	ft ²	m ²	ft	m	ft	m	ft ²	m ²	ft	m	ft	m	ft	m
6	75	7	25	7.6	—	—	25	7.6	34	10.4	500	46.5	25	7.6	35	10.7	25	7.6
8	115	10.5	36	11	150	14	32	9.8	40	12.2	800	74	36	11	44	13.4	37	11.3
16*	155	14.5	42	12.8	230	21	38	11.6	46	14	975	91	42	12.8	50	15.2	42	12.8
20	155	14.5	42	12.8	230	21	38	11.6	46	14	975	91	42	12.8	50	15.2	42	12.8
32*	225	21	48	14.6	335	30	43	13.1	53	16.2	1135	105	48	14.6	56	17	48	14.6
35	225	21	48	14.6	335	30	43	13.1	53	16.2	1135	105	48	14.6	56	17	48	14.6
40	270	25	54	16.5	410	38	49	14.9	57	17.4	1240	115	54	16.5	61	18.6	54	16.5
44*	340	31.5	64	19.5	560	52	59	18	68	20.7	1400	130	64	19.5	73	22.2	64	19.5
46	365	34	69	21	625	58	64	19.5	73	22.2	1530	142	68	20.7	78	23.8	69	21
48*	390	36	73	22.2	700	65	68	20.7	78	23.8	1750	162	74	22.5	82	25	73	22.2
50	390	36	73	22.2	700	65	68	20.7	78	23.8	1750	162	74	22.5	82	25	73	22.2
53*	435	40	77	23.5	765	72	73	22.2	85	25.9	1960	182	79	24	90	27.4	77	23.5
60	525	49	82	25	850	79	80	24.4	92	28	2200	204	85	25.9	98	29.9	82	25
70	590	55	86	26.2	1000	93	85	25.9	97	29.6	3000	279	91	27.7	108	33	86	26.2
74*	950	88	100	30.5	1350	125	102	31.1	—	—	—	—	105	32	—	—	—	—
80	950	88	100	30.5	1350	125	102	31.1	—	—	—	—	105	32	—	—	—	—

*K I k*O*af* i I kiv* Available in stainless steel, all-chrome, or bronze only.

Aluminum Radial®

Aluminum Radial® winches are designed for sailors who want lightweight, extremely strong winches with plenty of power.

The drum's gripping surface is shaped for each winch size and drum material and features diagonal ribs (rather than textured abrasive materials) to maximize gripping power and greatly reduce line wear. When easing, the angle of the ribs stops line from rising, preventing overrides and providing a smooth controlled release as the line exits the winch. Aluminum drums and high-strength composite self-tailing jaws and skirt save weight. Composite roller bearings reduce friction under load and don't require lubrication. Load-carrying gears and pins are 17-4PH stainless steel for strength and durability.

Small boat winches are available in single speed. Self-tailing models sizes 60 and up come in two or three speeds.



Series 20 Radial® winches use composite bushings to handle high loads in a small package.



1. Roller Bearings

Snap-fit design keeps bearings captive in a high-strength Delrin® cage when drum is removed for maintenance.

Composite roller bearings don't require lubrication.

2. Gripping surface

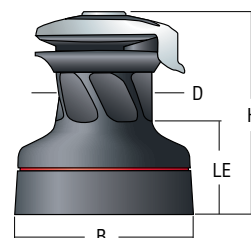
Each winch size has its own Radial® grip shape to optimize holding power and for smooth, controlled easing.



RADIAL® PLAIN-TOP



RADIAL® SELF-TAILING



Part No.	Ø		Base (B) in mm	Height (H) in mm	Weight		Line entry height (LE)		Line Ø (Min - Max)		Fastener circle		Fasteners (SH or HH)		Gear ratio			Power ratio				
	Drum (D) in mm				lb	kg	in	mm	in	mm	in	mm	in	mm	1	2	3	1	2	3		
Radial® Plain-Top																						
20.2PTA	2 7/8	73	5 3/8	137	5 1/16	128	4.4	2.0	2 3/8	61	—	—	4 3/8	110	5 x 1/4*	5 x 6	1	2.76	—	6.95	19.20	—
35.2PTA	3 1/8	80	5 7/8	149	5 9/16	148	6.8	3.1	3 1/8	79	—	—	4 7/8	123	5 x 1/4*	5 x 6	2.13	5.65	—	13.50	35.90	—
40.2PTA	3 3/8	80	6 1/16	157	6	153	7.7	3.5	3 1/4	82	—	—	4 7/8	123	5 x 1/4*	5 x 6	2.13	6.28	—	13.50	39.90	—
46.2PTA	3 3/8	100	7 1/4	184	7 1/16	179	11.3	5.1	3 9/16	90	—	—	5 7/8	150	5 x 5/16	5 x 8	2.30	9.17	—	11.70	46.50	—
50.2PTA	4 5/16	110	7 5/8	194	7 1/2	190	13.0	5.9	3 7/8	97	—	—	5 7/8	150	5 x 5/16	5 x 8	2.40	10.90	—	10.90	50.40	—
Radial® Self-Tailing																						
20STA	2 7/8	73	5 3/8	137	5 9/16	148	5.3	2.4	2 3/8	61	1/4 - 1/2	6 - 12	4 3/8	110	5 x 1/4*	5 x 6	2.76	—	—	19.20	—	—
35.2STA	3 1/8	80	5 7/8	149	6 11/16	170	7.9	3.6	3 3/8	79	5/16 - 1/2	8 - 12	4 7/8	123	5 x 1/4*	5 x 6	2.13	5.65	—	13.50	35.90	—
40.2STA	3 3/8	80	6 1/16	157	6 7/8	175	8.4	3.8	3 1/4	82	5/16 - 1/2	8 - 12	4 7/8	123	5 x 1/4*	5 x 6	2.13	6.28	—	13.50	39.90	—
46.2STA	3 3/8	100	7 1/4	184	7 15/16	201	11.5	5.2	3 9/16	90	5/16 - 9/16	8 - 14	5 7/8	150	5 x 5/16	5 x 8	2.30	9.17	—	11.70	46.50	—
50.2STA	4 5/16	110	7 5/8	194	8 5/16	212	13.2	6.0	3 7/8	97	5/16 - 9/16	8 - 14	5 7/8	150	5 x 5/16	5 x 8	2.40	10.90	—	10.90	50.40	—
60.2STA	4 3/4	120	9 5/16	236	9 11/16	246	22.5	10.2	4 9/16	116	5/16 - 5/8	8 - 16	8	204	6 x 5/16	6 x 8	4.80	14.40	—	20.30	61.00	—
60.3STA	4 3/4	120	9 5/16	236	9 11/16	246	25.8	11.7	4 9/16	116	5/16 - 5/8	8 - 16	8	204	6 x 5/16	6 x 8	2.20	4.80	14.40	9.20	20.30	61.00
70.2STA	5 1/8	130	9 7/16	240	10 1/16	256	24.9	11.3	4 1/2	115	3/8 - 11/16	10 - 18	8 1/8	205	6 x 5/16	6 x 8	5.70	18.50	—	22.20	72.00	—
70.3STA	5 1/8	130	9 7/16	240	10 1/16	256	28.3	12.8	4 1/2	115	3/8 - 11/16	10 - 18	8 1/8	205	6 x 5/16	6 x 8	2.30	5.70	18.50	9.00	22.20	72.00
80.2STA	6 7/8	175	11 5/16	287	12 9/16	320	46.8	21.2	6 7/16	164	3/8 - 11/16	10 - 18	9 3/16	233	8 x 3/8	8 x 10	9.94	32.12	—	28.85	93.24	—
80.3STA	6 7/8	175	11 5/16	287	12 9/16	320	50.1	22.7	6 7/16	164	3/8 - 11/16	10 - 18	9 3/16	233	8 x 3/8	8 x 10	2.76	9.94	32.12	8.01	28.85	93.24

*SH only

Aluminum Radial® Quattro

The patented Quattro is an innovative all-in-one winch used on boats that require extremely fast winches to handle large asymmetrical spinnakers, but also need power to trim the genoa upwind.

Radial® Quattro winches are offered in lightweight aluminum alloy and feature composite self-tailing jaws and skirt to save weight. High-strength composite roller bearings reduce friction under load and don't require lubrication. Load-carrying gears and pins are 17-4PH stainless steel for strength and durability.

The Quattro features two drum diameters and four line speeds. The upper drum features Harken's new shaped radial grip for reduced sheet wear and controlled easing. The wide-diameter lower drum has a sand-blasted gripping surface used for fast trimming.



The upper drum's gripping surface is shaped for each winch size to reduce line wear and to provide maximum gripping power for smooth, controlled easing.



Team Heiner 38, — Marc Antony Taminiau photo



40STQ
46STQ

Part No.	Gear ratio		Power ratio		Fastener circle		Fasteners (SH or HH)	
	1	2	1	2	in	mm	in	mm
40STQ	2.13	6.28	13.50	39.90	4 ⁷ / ₈	123	5 x 1 ¹ / ₄	5 x M6
46STQ	2.30	9.17	11.70	46.50	5 ⁷ / ₈	150	5 x 5 ⁹ / ₁₆	5 x M8

Part No.	Drum Ø				Base Ø		Height		Weight		Line Ø		Line entry height			
	Lower		Upper		in	mm	in	mm	lb	kg	Min	Max	Lower		Upper	
	in	mm	in	mm							in	mm	in	mm	in	mm
40STQ	6 ¹ / ₁₆	154	3 ¹ / ₈	80	7 ¹ / ₈	180	6 ⁷ / ₈	175	10.2	4.6	5 ⁹ / ₁₆	8	1 ¹ / ₂	12	1 ⁹ / ₁₆	34
46STQ	7 ¹³ / ₃₂	188	3 ¹⁵ / ₁₆	100	8 ¹ / ₂	218	7 ¹⁵ / ₁₆	201	13.7	6.2	5 ⁹ / ₁₆	8	9 ⁹ / ₁₆	14	1 ¹⁵ / ₁₆	23

Chrome Radial®

Chrome Radial Winches are designed for sailors who want the elegance of mirror-polished chrome to enhance their yacht's lines. They feature chrome drums, black composite bases and tops, and come in 1-, 2-, or 3-speed self-tailing styles.

The drum's gripping surface is shaped for each winch size and drum material and features diagonal ribs (rather than textured abrasive materials) to maximize gripping power and greatly reduce line wear. When easing, the angle of the ribs stops line from rising, preventing overrides and providing a smooth controlled release as the line exits the winch. High-strength composite self-tailing jaws and skirt save weight. Composite roller bearings reduce friction under load and don't require lubrication. Load-carrying gears and pins are 17-4PH stainless steel for strength and durability.

Small Boat winches are available in single speed. Self-tailing models sizes 60 and up come in two or three speeds.

Alerion 38, Carl Schumacher — Billy Black photo



WINCH Q&A

WHY DOES MY CHROME RADIAL WINCH HAVE A DIFFERENT GRIP PATTERN THAN AN ALUMINUM RADIAL?

Chrome has a more slippery finish than aluminum, so the ribs on chrome Radial winches are spaced closer together to increase friction. This optimizes your grip for trimming as well as for easing the sail in a smooth, controlled manner.

Part No.	Drum (D)		Base (B)		Height (H)		Weight		Line entry height (LE)		Line Ø (Min - Max)		Fastener circle		Fasteners (SH or HH)		Gear ratio			Power ratio		
	in	mm	in	mm	in	mm	lb	kg	in	mm	in	mm	in	mm	in	mm	1	2	3	1	2	3
20STC	2 ⁷ / ₈	73	5 ³ / ₈	137	5 ¹³ / ₁₆	148	7.5	3.4	2 ⁷ / ₈	61	1/4 - 1/2	6 - 12	4 ³ / ₈	110	5 x 1/4*	5 x 6	2.76	—	—	19.20	—	—
35.2STC	3 ¹ / ₈	80	5 ⁷ / ₈	149	6 ¹¹ / ₁₆	170	10.6	4.8	3 ¹ / ₈	79	5/16 - 1/2	8 - 12	4 ⁷ / ₈	123	5 x 1/4*	5 x 6	2.13	5.65	—	13.50	35.90	—
40.2STC	3 ¹ / ₈	80	6 ³ / ₁₆	157	6 ⁷ / ₈	175	11.9	5.4	3 ³ / ₄	82	5/16 - 1/2	8 - 12	4 ⁷ / ₈	123	5 x 1/4*	5 x 6	2.13	6.28	—	13.50	39.90	—
46.2STC	3 ⁷ / ₈	100	7 ¹ / ₄	184	7 ¹⁵ / ₁₆	201	17.2	7.8	3 ⁹ / ₁₆	90	5/16 - 9/16	8 - 14	5 ¹ / ₈	150	5 x 5/16	5 x 8	2.30	9.17	—	11.70	46.50	—
50.2STC	4 ⁵ / ₁₆	110	7 ⁷ / ₈	194	8 ⁵ / ₁₆	212	20.3	9.2	3 ⁷ / ₈	97	5/16 - 9/16	8 - 14	5 ¹ / ₈	150	5 x 5/16	5 x 8	2.40	10.90	—	10.90	50.40	—
60.2STC	4 ³ / ₄	120	9 ⁵ / ₁₆	236	9 ¹¹ / ₁₆	246	30.7	13.9	4 ⁹ / ₁₆	116	5/16 - 5/8	8 - 16	8	204	6 x 5/16	6 x 8	4.80	14.40	—	20.30	61.00	—
60.3STC	4 ³ / ₄	120	9 ⁵ / ₁₆	236	9 ¹¹ / ₁₆	246	34.0	15.4	4 ⁹ / ₁₆	116	5/16 - 5/8	8 - 16	8	204	6 x 5/16	6 x 8	2.20	4.80	14.40	9.20	20.30	61.00
70.2STC	5 ¹ / ₈	130	9 ⁷ / ₁₆	240	10 ¹ / ₁₆	256	33.3	15.1	4 ¹ / ₂	115	3/8 - 11/16	10 - 18	8 ⁷ / ₈	205	6 x 5/16	6 x 8	5.70	18.50	—	22.20	72.00	—
70.3STC	5 ¹ / ₈	130	9 ⁷ / ₁₆	240	10 ¹ / ₁₆	256	36.6	16.6	4 ¹ / ₂	115	3/8 - 11/16	10 - 18	8 ⁷ / ₈	205	6 x 5/16	6 x 8	2.30	5.70	18.50	9.00	22.20	72.00
80.2STC	6 ¹ / ₈	175	11 ⁵ / ₁₆	287	12 ⁹ / ₁₆	320	63.4	28.7	6 ⁷ / ₁₆	164	3/8 - 11/16	10 - 18	9 ⁷ / ₁₆	233	8 x 3/8	8 x 10	9.94	32.12	—	28.85	93.24	—
80.3STC	6 ⁷ / ₈	175	11 ⁵ / ₁₆	287	12 ⁹ / ₁₆	320	66.7	30.2	6 ⁷ / ₁₆	164	3/8 - 11/16	10 - 18	9 ⁷ / ₁₆	233	8 x 3/8	8 x 10	2.76	9.94	32.12	8.01	28.85	93.24

*SH only

Powered Radial Winches



PUSH-BUTTON CONTROL

Powered Radial winches allow crew to trim any size sail with the push of a button. Winches mount in minutes without removing the drum and can be quickly disassembled and serviced on deck. Seasonal maintenance is painless. Snap-fit socket, washer and screw top lift out as a unit, making reassembly fast and mistake free, with no leftover or misplaced parts to worry about.

DETAILS MAKE THE DIFFERENCE

MULTIPLE STYLES AND FINISHES

Winches available in aluminum alloy, chrome and in 2- and 3-speed self-tailing. Powered electric or hydraulic.

EASY TO CONVERT, INSTALL, SERVICE

The same drilling pattern is used to mount manual and electric winches of the same size. Other manufacturers must uninstall the existing manual winch, fill the old holes, and drill new holes before converting to electric winch power.

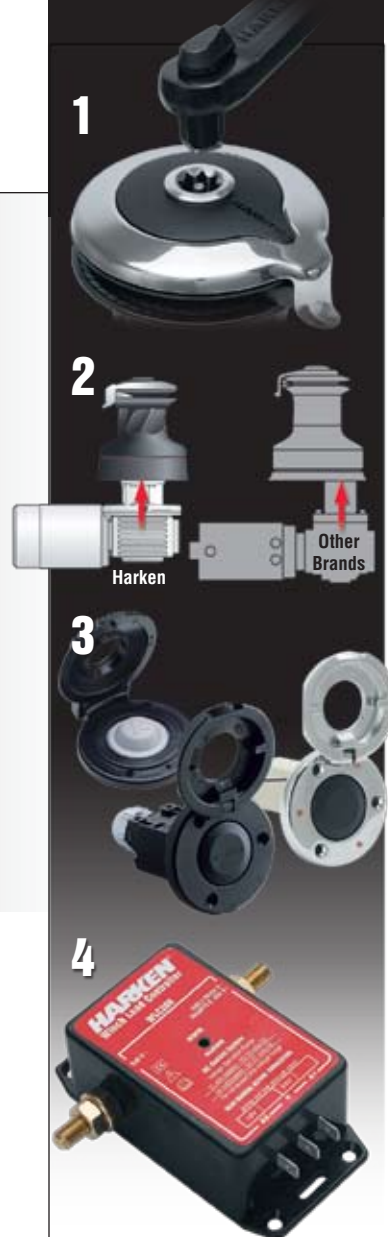
Builders can pre-drill a 3.00 inch (7.6 cm) gear shaft hole into the deck to simplify future conversion from manual to electric. Harken offers removable gaskets to seal the holes until upgrades are made.

Patent-pending stud-bolt mounting option allows quick installation without removing the drum.

Socket, washer, and screw-top snap-fit together to simplify maintenance and for mistake-free assembly.

INTEGRATED STRIPPER ARM

The strong, one-piece stripper arm completely covers the winch top for a stable platform that prevents fingers and clothing from catching in moving parts—an important safety feature, particularly when operating powered winches. The arm can be adjusted to multiple positions after the winch is mounted, and is shaped to smoothly feed line into and out of the self-tailing jaws.



1. Manual Override

A Harken® locking handle inserted into an unloaded winch automatically disconnects the motor gear for manual operation.

2. More Efficient Operation

Harken motors attach to the central drive shaft and drive through the winch gears for a two-speed mechanical advantage—the low-power first gear for fast trimming, the higher-power second gear for fine-tuning loaded sheets. The result is reduced battery drain, allowing more efficient use of the motor.

3. Reliable Switches

Winches operate with waterproof switches and reliable easy-to-service electric controls.

4. Winch Load Controller

This electronic system protects Harken® winches from overload by temporarily interrupting the power supply to the winch. The Load Controller comes installed with standard overload settings, but can be customized by request.

Electric and Hydraulic Radial®

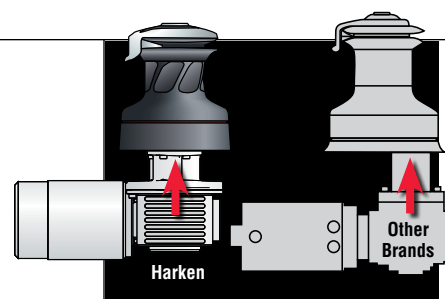
Electric and Hydraulic Radial® winches let you relax in luxury and trim any size sail with the push of a button.

Lightweight aluminum or mirror-finished chrome drums, and high-strength composite self-tailing jaws and skirt save weight. Composite roller bearings reduce friction under load and don't require lubrication. Load-carrying gears and pins are 17-4PH stainless steel for strength and durability.

Manual Radials easily convert to electric or hydraulic power. They don't require an adapter plate, and the identical stud pattern means no filling old holes and drilling new ones. Boatbuilders can make upgrades even easier by pre-cutting and sealing a 3.00 inch (7.6 cm) drive-shaft hole into the boat.

Electric motors are available for vertical or horizontal installation. Hydraulic motors mount vertically, and both operate using waterproof switches located near the winch. A locking handle inserted into an unloaded winch automatically disconnects the motor gear for manual operation.

Electric Radial® size 40 available in 12 volt only. Sizes 46 through 80 available in 12 or 24 volts. Hydraulic Radial® available in sizes 46 through 80.



Harken electric and hydraulic motors attach to the central drive shaft and drive through the winch gears for a two-speed mechanical advantage—the low-power first gear for fast trimming, the higher-power second gear for fine-tuning loaded sheets.

This results in reduced battery drain and a more efficient motor on the electric version. The energy-efficient hydraulic version is also smaller, reducing weight and cost.



HYDRAULIC

ELECTRIC HORIZONTAL

ELECTRIC VERTICAL

Part Numbers

Specify power type, material, voltage, and motor configuration when ordering

44.2STEC12H

Winch size

Number of speeds

Self-tailing

Power type

E = Electric

H = Hydraulic

Material code

A = Aluminum

C = Chrome

(For additional material options in non-Radial winches see pages 186-189 and 191-193)

Voltage

12 = 12V

24 = 24V

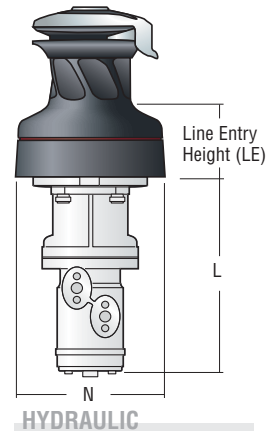
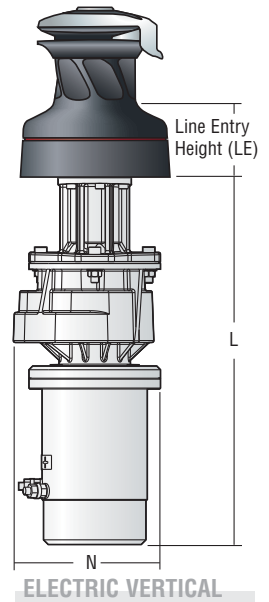
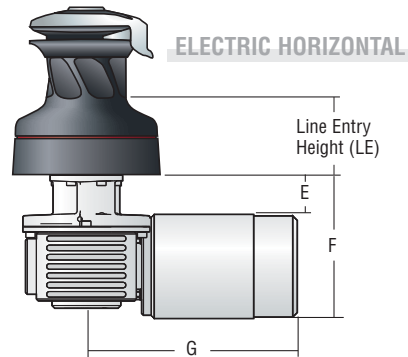
Motor configuration (Specify for electric; hydraulic available in vertical only)

H = Horizontal

V = Vertical

Radial® Electric & Hydraulic Motors

Specify power type, material, voltage, and motor configuration when ordering. See page 179 for part number explanation.



Dimensions

Part No.	E		F		G		L		N		Weight A		Weight C	
	in	mm	in	mm	in	mm	in	mm	in	mm	lb	kg	lb	kg
Electric														
40.2STEh	1 ³ / ₄	43	6 ¹ / ₈	155	8 ⁷ / ₈	227	—	—	—	—	29.7	13.5	33.2	15.1
46.2STEh	1 ³ / ₄	43	6 ¹ / ₈	155	8 ⁷ / ₈	227	—	—	—	—	32.8	14.9	38.5	17.5
46.2STEh	—	—	—	—	—	—	15 ³ / ₈	391	6 ¹ / ₈	157	36.9	16.7	42.6	19.3
50.2STEh	2 ³ / ₄	69	7 ¹ / ₈	181	9 ⁵ / ₈	244	—	—	—	—	37.1	16.8	44.2	20.0
50.2STEh	—	—	—	—	—	—	15 ³ / ₈	391	6 ¹ / ₈	157	38.6	17.5	45.7	20.7
60.2STEh	2 ³ / ₄	69	7 ¹ / ₈	181	9 ⁵ / ₈	244	—	—	—	—	46.4	21.0	54.5	24.7
60.2STEh	—	—	—	—	—	—	15 ³ / ₈	391	6 ¹ / ₈	157	47.9	21.7	56.1	25.4
60.3STEh	2 ³ / ₄	69	7 ¹ / ₈	181	9 ⁵ / ₈	244	—	—	—	—	49.7	22.5	57.8	26.2
60.3STEh	—	—	—	—	—	—	15 ³ / ₈	391	6 ¹ / ₈	157	51.2	23.2	59.4	26.9
70.2STEh	2 ³ / ₄	69	7 ¹ / ₈	181	9 ⁵ / ₈	244	—	—	—	—	48.8	22.1	57.2	25.9
70.2STEh	—	—	—	—	—	—	15 ³ / ₈	391	6 ¹ / ₈	157	50.3	22.8	58.7	26.6
70.3STEh	2 ³ / ₄	69	7 ¹ / ₈	181	9 ⁵ / ₈	244	—	—	—	—	52.1	23.6	60.5	27.4
70.3STEh	—	—	—	—	—	—	15 ³ / ₈	391	6 ¹ / ₈	157	53.6	24.3	62.0	28.1
80.2STEh	3 ³ / ₈	81	8 ¹¹ / ₁₆	221	10 ¹¹ / ₁₆	272	—	—	—	—	70.6	32.0	87.2	39.5
80.2STEh	—	—	—	—	—	—	16 ¹³ / ₁₆	427	6 ³ / ₄	172	72.2	32.7	88.7	40.2
80.3STEh	3 ³ / ₈	81	8 ¹¹ / ₁₆	221	10 ¹¹ / ₁₆	272	—	—	—	—	74.0	33.5	90.5	41.0
80.3STEh	—	—	—	—	—	—	16 ¹³ / ₁₆	427	6 ³ / ₄	172	75.5	34.2	92.1	41.7
Hydraulic														
46.2STH	—	—	—	—	—	—	9 ¹ / ₄	234	5 ¹ / ₈	130	28.0	12.7	33.8	15.3
50.2STH	—	—	—	—	—	—	9 ¹ / ₄	234	5 ¹ / ₈	130	29.8	13.5	36.9	16.7
60.2STH	—	—	—	—	—	—	9 ¹ / ₄	234	5 ¹ / ₈	130	39.1	17.7	47.2	21.4
60.3STH	—	—	—	—	—	—	9 ¹ / ₄	234	5 ¹ / ₈	130	42.4	19.2	50.6	22.9
70.2STH	—	—	—	—	—	—	9 ¹ / ₄	234	5 ¹ / ₈	130	41.5	18.8	49.9	22.6
70.3STH	—	—	—	—	—	—	9 ¹ / ₄	234	5 ¹ / ₈	130	44.8	20.3	53.2	24.1
80.2STH	—	—	—	—	—	—	9 ¹ / ₈	250	5 ¹ / ₈	130	66.4	30.1	83.0	37.6
80.3STH	—	—	—	—	—	—	9 ¹ / ₈	250	5 ¹ / ₈	130	69.8	31.6	86.3	39.1

Winch size	Electric motor configuration		Current voltage		Power in Watts	
	Horizontal (STEh)	Vertical (STEV)	12 V	24 V	12 V	24 V
40.2	✓	—	✓	—	700	—
46.2	✓	✓	✓	✓	700	900
50.2	✓	✓	✓	✓	1500	2000
60.2 - 60.3	✓	✓	✓	✓	1500	2000
70.2 - 70.3	✓	✓	✓	✓	1500	2000
80.2 - 80.3	✓	✓	✓	✓	1500	2000

Electric Wire Gauges

Winch size	Current voltage	Total distance between winch and battery							
		Under 16.4 ft	Under 5 m	16.4 - 32.8 ft	5 m - 10 m	32.8 - 49.2 ft	10 m - 15 m	49.2 - 65.6 ft	15 m - 20 m
		AWG	mm ²	AWG	mm ²	AWG	mm ²	AWG	mm ²
40.2	12 V	2	32	0	50	00	70	000	95
46.2	12 V	2	32	0	50	00	70	000	95
46.2	24 V	5	16	3	25	2	35	0	50
50.2	12 V	2	32	0	50	00	70	000	95
50.2	24 V	5	16	3	25	2	35	0	50
60.2 - 60.3	12 V	2	32	0	50	00	70	000	95
60.2 - 60.3	24 V	5	16	3	25	2	35	0	50
70.2 - 70.3	12 V	2	32	0	50	00	70	000	95
70.2 - 70.3	24 V	5	16	3	25	2	35	0	50
80.2 - 80.3	12 V	2	32	0	50	00	70	000	95
80.2 - 80.3	24 V	5	16	3	25	2	35	0	50

UniPower Radial®

The UniPower is a single-speed winch that combines the advantages of a low-profile manual winch with the power of a 12- or 24-volt, low-amp-draw motor. What makes it unique is that the motor is partially imbedded inside the drum, so that it extends only 4 1/8 inches (105 mm) below the winch base—a critical feature for small boats where space under the cabin top is limited.

Winch drums come in durable lightweight aluminum or mirror-finished chrome. High-strength composite self-tailing jaws and skirt save weight. Composite roller bearings reduce friction under load and don't require lubrication. The stripper arm and load-carrying gears on both aluminum and chrome versions are 17-4PH stainless steel for strength and durability.

Accessories Included

Winches include a waterproof switch and a one-speed control box with built-in current controller to protect hardware by electronically limiting the winch's maximum pull to 1984 lbs (900 kg).



Low-profile electric motor saves head space



Works with handle if power is unavailable



900UPWA

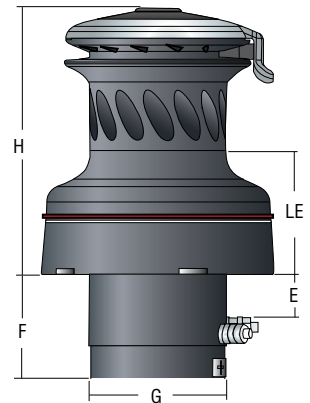


900UPWC



WLC2000UPW

BRS104/P



UniPower Winches

Part No.	Line entry height (LE)		E		F		G	
	in	mm	in	mm	in	mm	in	mm
900UPWA/C	3 ¹⁵ / ₁₆	100	1 ³ / ₈	35	4 ¹ / ₈	105	5 ¹ / ₂	140

Part No.	Drum		Base		Height (H)		Weight		Line Ø (Min - Max)		Fastener Circle		Fasteners (SH or HH)		Max Pull	
	in	mm	in	mm	in	mm	lb	kg	in	mm	in	mm	in	mm	lb	kg
900UPWA	4 ³ / ₈	110	7 ¹ / ₂	190	8 ¹ / ₂	215	26.5	12.0	5/16 - 9/16	8 - 14	6 ⁵ / ₁₆	160	5 x 1/4	5 x 6	1984	900
900UPWC	4 ³ / ₈	110	7 ¹ / ₂	190	8 ¹ / ₂	215	32.0	14.5	5/16 - 9/16	8 - 14	6 ⁵ / ₁₆	160	5 x 1/4	5 x 6	1984	900

Specify voltage when ordering.

Accessories Included

Part No.	Description	Voltage	Motor power watts	Cut-off load lb	Cut-off load kg	Length in	Length mm	Width in	Width mm	Height in	Height mm	Weight oz	Weight g
BRS104/P	Remote switch w/guard	—	—	—	—	3 ³ / ₈	85	3	76	3/4	19	3.4	95
WLC2000UPW	Control box w/current controller	12 V	700 W	1874	850	4 ¹⁵ / ₁₆	125	5 ⁵ / ₁₆	135	2 ⁹ / ₁₆	65	17.6	500

Rewind™ Radial® Electric Winch

The Rewind™ Radial® electric winch is the latest in Harken's "easy sailing" solutions for cruisers, and the first winch of its kind in the marine market. Activated remotely by twin in/out buttons, the Rewind Radial lets you safely ease and trim highly loaded sails in both directions without ever taking the line out of the self tailer, a patented feature.

Whether you solo or are passaging with friends, the Rewind will make your cruise relaxing and fun, allowing both you and your guests to take pleasure in the sea's beauty instead of hauling line and cranking winches.

Like all electric Radials, the Rewind operates like a normal Harken two-speed electric winch. A simple flip of the red knob on the winch base turns on the rewind feature. A spring-loaded arm of investment cast stainless steel funnels and keeps line captive as it feeds in and out of the self-tailer while you adjust the sail under fingertip control.

Available in aluminum, 12-volt horizontal motor only.



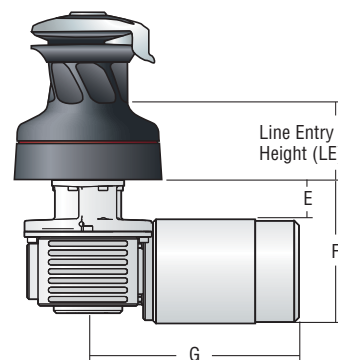
A Harken® locking handle inserted into an unloaded winch automatically disconnects the motor gear for manual operation



Activated remotely by twin in/out buttons, the Radial Rewind lets you safely ease and trim highly-loaded sails in both directions without ever taking the line out of the self tailer



A simple flip of the red knob on the winch base turns on the rewind feature



Part No.	Line entry height (LE)		E		F		G	
	in	mm	in	mm	in	mm	in	mm
46RWA	3 ⁹ / ₁₆	90	1 ³ / ₄	43	6 ¹ / ₈	155	11	280

Part No.	Drum		Base		Height (H)		Weight		Line Ø (Min - Max)		Fastener circle		Fasteners (SH or HH)		Gear ratio		Power ratio	
	in	mm	in	mm	in	mm	lb	kg	in	mm	in	mm	in	mm	1	2	1	2
46RWA	3 ⁷ / ₈	100	7 ¹ / ₄	184	8	203	35.3	16	3 ⁷ / ₈ - 9 ¹ / ₁₆	10 - 14	5 ⁷ / ₈	150	5 x 5 ¹ / ₁₆	5 x 8	2.3	9.17	11.7	46.5

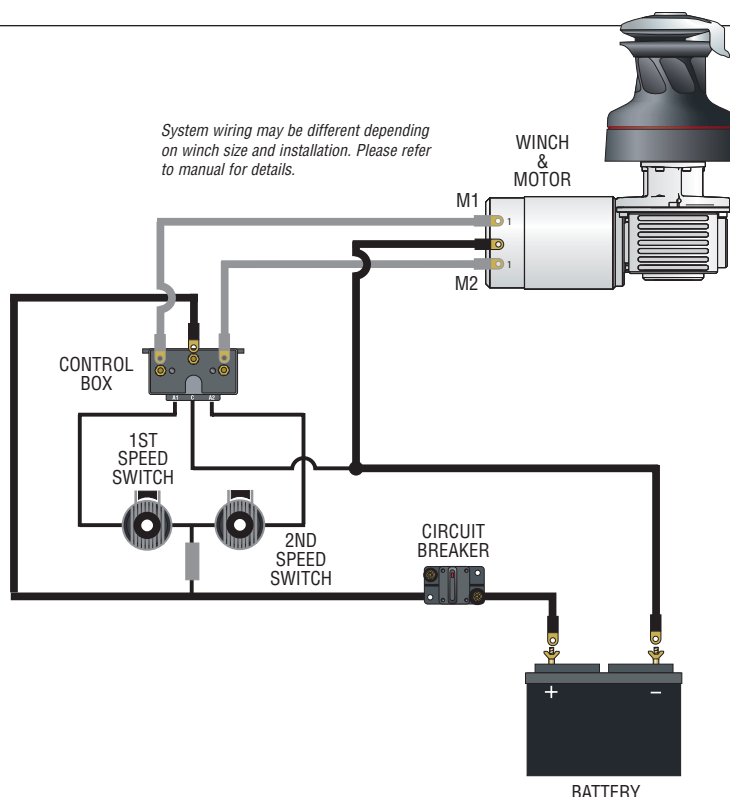
Kit: see page 184 (available in USA only)

Electric Systems

Battery voltage and winch size determine which control boxes, circuit breakers, and load controllers you should use. For winches size B1110 and above, contact Harken for appropriate components.



Jeanneau 53, Philippe Briand Yacht Design, Garroni Premorel, Jeanneau Yachts



Electric Systems

Order components separately based on winch size and voltage.

Winch size	Switches (2)	Control box		Circuit breaker		Load controller‡	
		12 V	24 V	12 V	24 V	12 V	24 V
Radial®							
40.2STE	BRS104/P or BRS102*	BEB1000.12.1	—	HCP1717	—	WLC200R.40.12**	—
46.2STE	BRS104/P or BRS102*	BEB1000.12.1	BEB1000.24.1	HCP1717	HCP1717	WLC200R.46.12**	WLC200R.46.24**
						WLC200RV.46-50.12***	WLC200RV.46-50.24***
50.2STE	BRS104/P or BRS102*	BEB1000.12.1	BEB1000.24.1	HCP1720	HCP1717	WLC200R.50.12**	WLC200R.50.24***
						WLC200RV.46-50.12***	WLC200RV.46-50.24***
60.2STE	BRS104/P or BRS102*	BEB1000.12.1	BEB1000.24.1	HCP1720	HCP1717	WLC200R.60-70.12**	WLC200R.60-70.24***
						WLC200RV.60-70.12***	WLC200RV.60-70.24***
60.3STE	BRS104/P or BRS102*	BEB1000.12.1	BEB1000.24.1	HCP1720	HCP1717	—	—
70.2STE	BRS104/P or BRS102*	BEB1000.12.1	BEB1000.24.1	HCP1720	HCP1717	WLC200R.60-70.12**	WLC200R.60-70.24***
						WLC200RV.60-70.12***	WLC200RV.60-70.24***
70.3STE	BRS104/P or BRS102*	BEB1000.12.1	BEB1000.24.1	HCP1720	HCP1717	—	—
80.2STE	BRS104/P or BRS102*	BEB1000.12.1	BEB1000.24.1	HCP1720	HCP1717	—	—
80.3STE	BRS104/P or BRS102*	BEB1000.12.1	BEB1000.24.1	HCP1720	HCP1717	—	—
Classic‡‡							
B40.2STE	BRS104/P or BRS102*	BEB500.12.1	—	HCP1717	—	WLC200.12.1**	—
B44.2STE	BRS104/P or BRS102*	BEB1000.12.1	BEB1000.24.1	HCP1718	HCP1716	WLC200.12.2**	WLC200.24.1**
B46.2STE	BRS104/P or BRS102*	BEB1000.12.1	BEB1000.24.1	HCP1718	HCP1716	WLC200.12.2**	WLC200.24.1**
B48.2STE	BRS104/P or BRS102*	BEB1000.12.1	BEB1000.24.1	HCP1718	HCP1716	WLC200.12.3**	WLC200.24.2**
B53.2STE	BRS104/P or BRS102*	BEB1000.12.1	BEB1000.24.1	HCP1718	HCP1716	WLC200.12.3**	WLC200.24.2**
B60.2STE	BRS104/P or BRS102*	BEB1000.12.1	BEB1000.24.1	HCP1718	HCP1717	—	—
B70.2STE	BRS104/P or BRS102*	BEB1000.12.1	BEB1000.24.1	HCP1719	HCP1717	—	—
B74.2STE	BRS104/P or BRS102*	BEB1000.12.1	BEB1000.24.1	HCP1719	HCP1717	—	—
B980.2STE	BRS104/P or BRS102*	BEB1000.12.1	BEB1000.24.1	HCP1719	HCP1717	—	—
B980.3STE	BRS104/P or BRS102*	BEB1000.12.1	BEB1000.24.1	HCP1719	HCP1717	—	—

*Specify P for black or S for stainless steel **Recommended ***Required
 ‡‡Contact Harken to request quote and lead time. Classic winches not stocked.

‡Order WLC200RV versions for winches with vertical motors

Radial® Electric Winch Kits

Kits are offered for the most common winches. Kits include the winch and a motor, a control box, a circuit breaker, and two BRS104/P switches. Please include the materials code, vertical or horizontal motor, and voltage, when ordering a kit.



Jeanneau Sun Odyssey 45 DS

Kit



Winch & Motor



Control Box



Circuit Breaker



2 Switches

Radial® Winch Kits

Kits available in USA only. If ordering electric winch and components separately, use the part numbers listed under components to determine the correct accessories based on winch size and voltage.

Part No.	Winch size	Components included in kit					Components not included: order separately	
		Switches (2)	Control box		Circuit breaker		Load controller‡	
			12 V	24 V	12 V	24 V	12 V	24 V
K40.2STE	40.2STE	BRS104/P	BEB1000.12.1	—	HCP1717	—	WLC200R.40.12*	—
K46.2STE	46.2STE	BRS104/P	BEB1000.12.1	BEB1000.24.1	HCP1717	HCP1717	WLC200R.46.12*	WLC200R.46.24*
K46RWA	46 Rewind™	BRS104/P	BEB1000.12.1	—	HCP1717	—	WLC200RV.46-50.12**	WLC200RV.46-50.24**
K50.2STE	50.2STE	BRS104/P	BEB1000.12.1	BEB1000.24.1	HCP1720	HCP1717	WLC200R.50.12*	WLC200R.50.24**
							WLC200RV.46-50.12**	WLC200RV.46-50.24**

*Recommended **Required ‡Order WLC200RV versions for winches with vertical motors

Electric Components

Each electric winch requires one control box, one breaker, and two switches. Harken recommends adding an optional load controller. For winches larger than B980, please contact Harken. Hydraulic units require two switches.

Switches

Harken® offers simple, waterproof switches for electric and hydraulic winches. Order two switches for each winch.

Electrical Control Boxes

Electric control boxes contain solenoids to operate the winches. Based on winch size and voltage, select one control box for each electric winch.

High-Amperage Circuit Breakers

Harken® offers five panel-mount, high-amperage circuit breakers. They are compact, waterproof, weather-resistant, and ignition-protected. Circuit breakers are available for 12- or 24-volt DC systems.

Load Controllers

The winch load controller is an electronic system that protects Harken® winches from overload by temporarily interrupting the power supply to the winch. The Load Controller comes installed with standard overload settings, but can be customized on request. Use WLC200R with Radial® winches. For further information contact Harken® Italy.



BRS104/P

BRS102/P

BRS102/S

SWITCHES

CIRCUIT
BREAKERSELECTRIC
CONTROL BOXESLOAD
CONTROLLERS

Deck Switches

Part No.	Description	Length		Width		Height		Weight	
		in	mm	in	mm	in	mm	oz	g
BRS102/P/S	Remote switch w/guard	2 ¹¹ / ₁₆	68	2 ¹¹ / ₁₆	68	1 ⁹ / ₁₆	21	4.5	128
BRS104/P	Remote switch w/guard	3 ³ / ₈	85	3	76	3/4	19	3.4	95

Electric Control Boxes

Part No.	Voltage	Length		Width		Height		Weight		Use with winch
		in	mm	in	mm	in	mm	oz	g	
BEB500.12.1	12	5 ¹ / ₂	140	3 ⁵ / ₃₂	80	4 ¹¹ / ₃₂	110	35.3	1000	Classic: B40.2STE
BEB1000.12.1	12	5 ¹ / ₂	140	3 ⁵ / ₃₂	80	4 ¹¹ / ₃₂	110	35.3	1000	Radial®: 40.2STE to 70.2STE Classic: B44.2STE to 980.2STE
BEB1000.24.1	24	5 ¹ / ₂	140	3 ⁵ / ₃₂	80	4 ¹¹ / ₃₂	110	35.3	1000	Radial®: 46.2STE to 70.2STE Classic: B44.2STE to 980.2STE

Circuit Breakers

Part No.	Max amps	Power watts	Use with winch
24 Volt			
HCP1717	80	2000	Radial®: 46.2STE to 70.2STE Classic: B44.2STE to B980.2STE
12 Volt			
HCP1717	80	500	Radial®: 40.2STE & 46.2STE Classic: B40.2STE
HCP1718	100	1500	Classic: B70.2STE to B980.2STE
HCP1719	150	1500	Classic: B70.2STE to B980.2STE
HCP1720	135	1500	Radial®: 50.2STE to 70.2STE

Load Controllers

Part No.	Use with winch	Included with winch	Limitation	Voltage	Motor power watts	2nd speed blocking current	Length in	mm	Width in	mm	Height in	mm	Weight oz	g
Radial® Horizontal														
WLC200R.40.12	40	—	Recommended	12	700	161	3 ¹¹ / ₃₂	85	2 ⁷ / ₃₂	56	1 ³ / ₈	35	7.4	210
WLC200R.46.12	46	—	Recommended	12	700	136	3 ¹¹ / ₃₂	85	2 ⁷ / ₃₂	56	1 ³ / ₈	35	7.4	210
WLC200R.46.24	46	—	Recommended	24	900	117	3 ¹¹ / ₃₂	85	2 ⁷ / ₃₂	56	1 ³ / ₈	35	7.4	210
WLC200R.50.12	50	—	Recommended	12	1500	200	3 ¹¹ / ₃₂	85	2 ⁷ / ₃₂	56	1 ³ / ₈	35	7.4	210
WLC200R.50.24	50	✓	Required	24	2000	139	3 ¹¹ / ₃₂	85	2 ⁷ / ₃₂	56	1 ³ / ₈	35	7.4	210
WLC200R.60-70.12	60/70	—	Recommended	12	1500	200	3 ¹¹ / ₃₂	85	2 ⁷ / ₃₂	56	1 ³ / ₈	35	7.4	210
WLC200R.60-70.24	60/70	✓	Required	24	2000	138	3 ¹¹ / ₃₂	85	2 ⁷ / ₃₂	56	1 ³ / ₈	35	7.4	210
Radial® Vertical														
WLC200RV.46-50.12	46/50	✓	Required	12	1500	200	3 ¹¹ / ₃₂	85	2 ⁷ / ₃₂	56	1 ³ / ₈	35	7.4	210
WLC200RV.46-50.24	46/50	✓	Required	24	2000	115	3 ¹¹ / ₃₂	85	2 ⁷ / ₃₂	56	1 ³ / ₈	35	7.4	210
WLC200RV.60-70.12	60/70	✓	Required	12	1500	200	3 ¹¹ / ₃₂	85	2 ⁷ / ₃₂	56	1 ³ / ₈	35	7.4	210
WLC200RV.60-70.24	60/70	✓	Required	24	2000	114	3 ¹¹ / ₃₂	85	2 ⁷ / ₃₂	56	1 ³ / ₈	35	7.4	210
Classic														
WLC200.12.1	B40	—	Recommended	12	500	200	3 ¹¹ / ₃₂	85	2 ⁷ / ₃₂	56	1 ³ / ₈	35	7.4	210
WLC200.12.2	B44/B46	—	Recommended	12	1500	200	3 ¹¹ / ₃₂	85	2 ⁷ / ₃₂	56	1 ³ / ₈	35	7.4	210
WLC200.24.2	B44/B46	—	Recommended	24	2000	105	3 ¹¹ / ₃₂	85	2 ⁷ / ₃₂	56	1 ³ / ₈	35	7.4	210
WLC200.12.3	B48/B53	—	Recommended	12	1500	200	3 ¹¹ / ₃₂	85	2 ⁷ / ₃₂	56	1 ³ / ₈	35	7.4	210
WLC200.24.3	B48/B53	—	Recommended	24	2000	105	3 ¹¹ / ₃₂	85	2 ⁷ / ₃₂	56	1 ³ / ₈	35	7.4	210



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