

# NAVTEC FRANCE

## HYDRAULICS



NAVTEC FRANCE - P.A de la Siagne, Allée Charles Nungesser 06210 MANDELIEU – France  
T. 33(0)4 93 90 24 60 - F. 33(0)4 93 90 24 61 – EMail : [navtec@navtecsudeurope.fr](mailto:navtec@navtecsudeurope.fr)  
<https://www.facebook.com/navtecsudeurope.fr>

SIRET 793 366 733 00012 – APE 3315Z – TVA INTRA FR56793366733 – CAPITAL 255 001 € - RCS CANNES 793 366 733



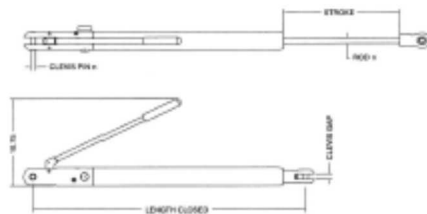
# NAVTEC FRANCE

## HYDRAULICS

Navtec hydraulic systems offer precise control and a significant sailing advantage for racers and cruisers. Whether your boat is a Grand Prix race yacht or a 200 foot superyacht, Navtec hydraulic systems can be customized to meet your exact requirements.

### A370 Hydraulic Integral Backstay Adjuster

Ergonomics meets economics. The new Navtec Series 9 Integral incorporates several key design features while keeping to the high marine standard that Navtec is known for. The Series 9 design moves the hydraulic feed tube inside to give the unit a sleek look. The pump piston size has been increased to ½" to increase flow, which produces the faster action need for today's modern mast. The integral is designed to be used with the integral Toggle. Available with a black or a clear finish.



PART NUMBER	MAX PULL FORCE @ RELIEF		LENGTH CLOSED		LENGTH OPEN		WEIGHT		MAX WIRE SIZE	
	lbs	kg	in	mm	in	mm	lbs	kg	in	mm
A370-BLE-006	3,500	1,590	31,1	790	44,6	1133	7	3,18	7/32	5,6
A370-BLE-010	5,400	2,450	31,1	791	44,6	1134	7,3	3,31	9/32	7,1
A270-BLE-012	6,500	2,950	33,5	850	47,8	1213	12,2	5,53	5/16	7,9
A370-BLE-017	8,700	3,950	33,5	850	47,8	1213	12,2	5,53	3/8	9,5
A370-BLE-022	11,100	5,030	33,5	902	50,5	1283	15,5	7,03	7/16	11,1

PART NUMBER	PISTON ROD DIAMETER		CLEVIS PIN & GAP	
	in	mm	in	mm
A370-BLE-006	9/16	14	7/16	11,1
A370-BLE010	9/16	14	1/2	12,7
A370-BLE-012	5/8	16	5/8	15,9
A370-BLE-017	5/8	16	5/8	15,9
A370-BLE-022	3/4	19	3/4	19,1

### Backstay Toggle

PART NUMBER**	LENGTH PIN-PIN	
	in	mm
A370-20A06	2,00	50,8
A371-20A10	2,00	50,8
A371-20A17A	2,33	59,2
A371-20A22	2,98	75,7

The A370 is supplied as standard with a black finish. To order a clear finish, please replace the -BLE in the part number with -CLE  
Integral Backstay Adjuster assembly includes handle, clevis pins and bushings (-6)

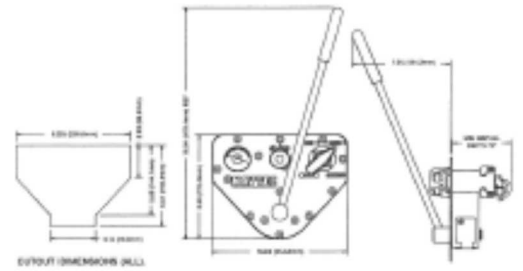
- Max relief setting is 4.000 psi, except for -6 and -12, which are 3.000 psi
- \*\* -12 & -17 Cylinders use the A371-20A17A toggle

# NAVTEC FRANCE

## System 50 Hydraulic Panel

The System 50 Hydraulic Panel is at the heart of a Navtec hydraulic system, putting the operator in complete control of up to four functions, including halyards, Cunningham, mast jack, traveler, vang, backstay or outhaul functions. System 50 is designed to meet the changing requirements of racing and cruising yachts in the 35 to 70 foot LOA range.

- Ease of operation. Controlled flow, gradual release valve.
- High speed: Faster flow rate = faster response.
- Optional auto-shift pump. Two-speed pump offers high volume and the pump functions with adjustable shift pressure.
- Power interface. Leading winch powerpacks can interface with, and be accurately controlled by, the System 50.
- Protection. Relief valve provides immediate pressure release for the selected function.
- Finish. Black anodized or stainless steel.
- Reservoir. The standard on a single function is a two-quart reservoir, with the four-quart capacity as standard on a multifunction panel.



PART NUMBER	DESCRIPTION	MIN. INSTALLATION DEPTH "D"		WEIGHT	
		in	mm	lbs	kg
A320-SF-01	Single-function, single speed pump	3,75	95,30	10,10	4,58
A320-SF-02	Single-function, 2 speed auto-Shift pump	5,50	139,70	10,80	4,90
A320-MF-01	Multi-function, single speed pump	4,50	114,30	13,00	5,90
A320-MF-02	Multi-function, 2 speed auto-Shift pump	5,50	139,70	13,70	6,21
A320-SF4-01	Single function, single speed pump, with 4-way valve*	5,50	139,70	14,30	6,50
A320-SMC-01	Single to multi-function conversion kit	N/A	N/A	2,00	0,91

System 50 assembly includes pump, handle, valves, reservoir, hose and in-line filter.

For stainless steel faceplate option, add(S) to end of any above part number. Example: A320-SF-01S. Add 1.3 lbs above assembly weights.

Multi-function panels can be used to control 1, 2, 3 or 4 hydraulic functions.

The 2-speeds Auto Shift pump supplies 300 %more flow at low pressure.

Single-function panel assemblies include a quart molded reservoir. Multi-function panels include a 4 quart reservoir.

\*4-way valve is to control double-acting (push-pull) cylinders.

# NAVTEC FRANCE

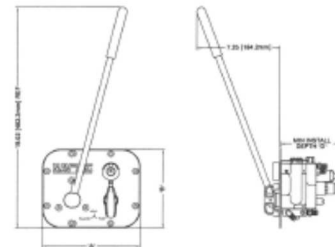
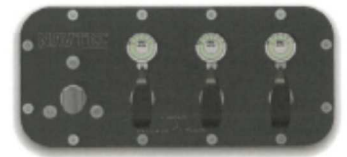
## System VIII Hydraulic panel Specifications

The system VIII panel incorporates cam valve technology developed by Navtec. Cam valves make the System VIII easier to use and more durable at higher pressures than other systems. This is why the new System VIII panel is an ideal choice for Grand Prix race yachts and Super Yachts, which demand the highest level of performance available.

The System VIII offers improved design aesthetics and the same configuration offered in the System VII panels. The cam valve are sculpted to save weight and space. Each output has its own valve and gauge to monitor the function that it is controlling, and a relief valve that can be set individually. Flow control can be added to each valve by simply inserting flow control needles into the outlet of each valve.

The System VIII panels can be easily integrated with powered units provides by Navtec, Lewmar, winch manufacturers, or custom ship designers.

System VIII panels come in multiple configurations. Standard panels come with a hard-coated aluminum fact place. Stainless steel panels are also available.



PART NUMBER	DESCRIPTION	PANEL LENGTH A		PANEL HEIGHT B		MIN INSTALLATION DEPTH "D"		WEIGHT STD ALUMINUM		WEIGHT SS FACEPLATE	
		in	mm	in	mm	in	mm	lbs	kg	lbs	kg
<b>COMPLETE SYSTEMS</b>											
A380-L00-01	Single-function, left-hand pump	8,25	200,6	6,75	171,5	5,50	139,70	12,20	5,52	13,4	6,07
A380-L00-02	Two-function, left-hand pump	11,50	292,1	6,75	171,5	5,50	139,70	14,80	6,70	16,4	7,46
A380-L00-02/1*	Three-function, left-hand pump, 2 standard valves, 1 4-way valve	14,75	374,7	6,75	171,5	6,50	165,10	16,60	7,54	18,8	8,51
<b>COMPONENTS</b>											
A380-PO-02**	2 speed auto-Shift pump only panel, no control valves	4,75	120,7	6,50	165,1	5,50	139,70	5,80	2,64	6,5	2,95
A380-VGM-01***	Single-function, valve + gauge manifold only, no pump	5,00	127,0	6,75	171,5	4,75	120,70	3,00	1,36	3,7	1,68
A380-VGM-02***	Two-function, valve + gauge manifold only, no pump	8,25	209,6	6,75	171,5	4,75	120,70	5,90	2,68	7,2	3,25
A380-VGM-03***	Three-function, valve + gauge manifold only, no pump	11,50	292,1	6,75	171,5	4,75	120,70	8,60	3,90	10,3	4,68
A380-VGM-04***	Four-function, valve + gauge manifold only, no pump	14,75	374,7	6,75	171,5	4,75	120,70	11,50	5,22	13,6	6,17

System VIII assembly and specified weights include auto-shift, handle, valves, 4-quart molded reservoir, hose and in-line filter unless otherwise indicated.

For stainless steel faceplate option, add(S) to end of any above part number. Example: A380SL00-01

Right-hand pump configuration available. Change (L) to ® in any above part number. Example: A380-R00-01

Other custom configurations available.

For cutout dimensions, subtract 1.50 in (38.1mm) from panel dimensions.

- 4-way valve is to control double-acting (push-pull) cylinders
- \*\* does not include reservoir, filter or hose
- \*\*\* Does not include reservoir or filter

# NAVTEC FRANCE

## Hydraulic Cylinders

Minimal weight. Minimal windage. Maximum reliability. Navtec standard cylinder rods are made from 316 stainless steel. Tubes, lower clevis and caps are made of black hard-coated aluminum. Cylinder bores are specially polished for longer seal life. Navtec stainless steel cylinders represent the highest standard of performance worldwide, with 316 stainless construction throughout. Standard, Long, and Flattering Reef versions are available. Titanium componentry optional.

### A250 HP Hydraulic Cylinder



ART NUMBER	MAX PULL FORCE @ RELIEF		BODY DIAMETER		ROD THREAD	CLEVIS PIN & GAP	
	lbs	kg	in	mm		in	mm
-6	3,200	1,450	1,32	33,5	7/16-20	7/16	11,1
-10	5,800	2,630	1,66	42,2	½-20	½	12,7
-12	7,600	3,450	2	50,8	5/8-18	5/8	15,9
-17	10,900	4,940	2,25	57,2	5/8-18	5/8	15,9
-22	13,900	6,300	2,5	63,5	¾-16	¾	19,1
-30	22,100	10,020	3,25	82,6	7/8-14	7/8	22,2
-40	32,200	14,610	4	101,6	1-12	1	25,4
-48	32,200	14,610	4	101,6	1-12	1 1/8	28,6
-60	42,900	19,460	4,5	114,3	1 ¼-12	1 ¼	31,8
-76	42,900	19,460	5,5	114,3	1 1/4-12	SEE NOTE*	
-90	57,700	26,170	5,5	139,7	1 3/8-12	1 3/8	34,9
-110	73,200	33,200	6	152,4	1 3/8-12	1 1/2	28,1
-150	90,600	41,100	7	177,8	1 1/2-12	1 3/4	44,5

Max relief setting is 5,000 psi.

# NAVTEC FRANCE

## A250 Cylinders

PART NUMBER	STROKE		LENGTH CLOSED		WEIGHT STD ALUMINUM	
	in	mm	in	mm	lbs	kg
A250-SE-006	9,0	229	18,7	474	1,9	0,86
A250-LE-006	13,5	343	23,2	589	2,3	1,04
A250-FE-006	20,2	513	29,9	759	3,2	1,44
A250-SE-010	9,0	229	19,5	495	2,7	1,24
A250-LE-010	13,5	343	24	609	3,3	1,49
A250-FE-010	20,0	509	31,1	789	5,0	2,27
A250-SE-012	9,5	241	21,1	536	4,4	2,01
A250-LE-012	14,2	361	25,8	656	5,6	2,54
A250-FE-012	24,1	611	36,1	916	8,6	3,92
A250-SE-017	9,5	241	21,2	539	5,1	2,31
A250-LE-017	14,2	361	25,9	659	6,3	2,84
A250-FE-017	30,0	763	42,9	1090	10,7	4,87
A250-SE-022	10,0	254	23,2	589	7,2	3,26
A250-LE-022	15,0	381	28,2	717	8,6	3,89
A250-FE-022	35,0	890	49,4	1255	15,4	6,99
A250-SE-030	11,0	279	26,6	675	12,6	5,71
A250-LE-030	16,5	419	32,1	814	15,4	6,98
A250-FE-030	40,0	1016	56,4	1433	30,0	13,61
A250-SE-040	12,0	305	28,6	726	20,3	9,22
A250-LE-040	18,0	457	34,6	879	24,8	11,26
A250-FE-040	45,2	1148	63,2	1606	44,0	19,96
A250-SE-048	12,0	305	28,8	733	20,9	9,48
A250-LE-048	18,0	457	34,8	885	25,4	11,52
A250-SE-060	13,9	353	32,5	827	33,0	14,97
A250-LE-060	21,0	533	39,7	1007	38,0	17,24
A250-SE-076	15,0	381	34	863	35,8	16,24
A250-LE-076	22,5	572	41,5	1054	42,9	19,46
A250-SE-090	16,0	406	36,1	917	50,0	22,68
A250-LE-090	24,0	609	44,1	1120	61,4	27,85
A250-SE-110	18,0	457	40,2	1022	67,5	30,62
A250-LE-110	27,0	686	49,2	1250	82,0	37,19
A250-SE-150	18,0	457	41,7	1060	97,5	44,23
A250-LE-150	27,0	686	50,7	1288	117,0	53,07

SE = standard cylinder, LE = long cylinder, FE = flattening reef cylinder. For stainless steel option, add (S) to end of any above part number. Example: A250SSE-010.

NUTTED PINS STANDARD -60 and above, nutted pins available on smaller sizes.; Other custom cylinder configurations available \*PIN = 1 ¼ (31.8mm), GAP = 1 5/16 (33.3mm)



# NAVTEC FRANCE

## A260 Mechanical Lock Hydraulic Cylinder specifications

The Mechanical Lock allows the release of hydraulic pressure on the backstay cylinder while maintaining tension. However, there is no relief valve protection, as backstay tension is mechanically locked, not hydraulically controlled. This is useful for extended passages.



PART NUMBER	LENGTH CLOSED		WEIGHT STD ALUMINUM	
	in	mm	lbs	kg
A250-SE-006	32,2	818	3,6	1,63
A250-LE-006	41,2	1046	4,1	1,84
A250-SE-010	32,9	836	5,0	2,27
A250-LE-010	41,9	1065	6,4	2,88
A250-SE-012	35,6	904	8,2	3,74
A250-LE-012	44,8	1138	10,5	4,76
A250-SE-017	35,7	907	8,9	4,04
A250-LE-017	45,1	1146	11,1	5,03
A250-SE-022	37,7	957	12,4	5,62
A250-LE-022	47,7	1211	15,2	6,89
A250-SE-030	42,9	1089	21,4	9,71
A250-LE-030	53,4	1357	26,6	12,07
A250-SE-040	47	1194	32,6	14,79
A250-LE-040	59	1499	40,4	18,33
A250-SE-048	47,2	1200	33,2	15,06
A250-LE-048	59,2	1505	41,0	18,60
A250-SE-060	54,4	1381	51,4	23,31
A250-LE-060	68,4	1737	64,0	29,03
A250-SE-076	57,3	1454	54,9	24,90
A250-LE-076	72,4	1838	67,5	30,62
A250-SE-090	60,8	1544	81,0	36,74
A250-LE-090	76,4	1941	97,0	44,00
A250-SE-110	66,9	1698	119,8	54,33
A250-LE-110	84,9	2155	145,0	65,77
A250-SE-150	70,6	1792	158,9	72,06

See HP cylinder information for all other technical data.  
 Nutted pins standard -60 and above, nutted pins available on smaller sizes.  
 For stainless steel option, add (S) to any above part number. Example: A260SSE-010.

# NAVTEC FRANCE

## Cylinder Terminals

### H120 Fixed Clevis

The H120 Screws onto the cylinder piston rod, but does not provide length adjustment.



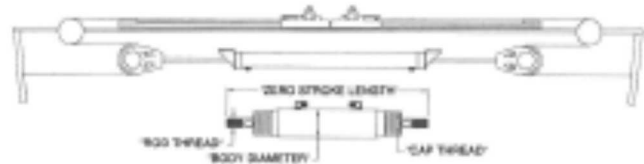
### J100 Eye / Jax Toggle

Used at the lower end of the cylinder to prevent excessive side loads. Frequently used on the backstay and inner forestay cylinders.

CYLINDER SIZE	PISTONROD SIZE		PIN DIAMETER		FIXED CLEVIS PART NUMBER	FIXED CLEVIS LENGTH		EYE JAX TOGGLE PART NUMBER	EYE JAW TOGGLE LENGTH	
	in	mm	in	mm		in	mm		in	mm
-6	7/16	11	7/16	11	H120-141414	1	25	J100-1414	2	51
-10	1/2	13	1/2	13	H120-161616	1,25	32	J100-1616	2,2	56
-12/-17	5/8	16	5/8	16	H120-202020	1,31	33	J100-2020	2,5	64
-22	3/4	19	3/4	19	H120-242424	1,38	35	J100-2424	2,9	74
-30	7/8	22	7/8	22	H120-282828	1,5	38	J100-2828	3,3	84
-40	1	25	1	25	H120-323232	1,5	38	J100-3232	3,69	94
-48	1	25	1 1/8	29	H120-323636	1,75	44	J100-3636	4,1	101
-60	1 1/4	32	1 1/4	32	H120-404040	2,5	64	J1004040	4,5	114
-76	1 1/4	32	1 1/4	32	H120-404040	2,5	64	J100-4040	4,5	114
-90	1 1/4	32	1 3/8	35	H120-404444	2,5	64	J100-4444	5,6	142
-110	1 3/8	35	1 1/2	38	H120-444848	3,04	77	J100-4848	6,2	157
-150	1 1/2	38	1 3/4	44	H120-485656	3,43	87	J100-5656	7,5	191

## A254 Hydraulic Traveler Cylinders

Navtec double rod cylinders were engineered and designed by Navtec for use in dual pull application, usually with a block and tackle incorporated. Navtec originally engineered these cylinders as a solution to operate mainsheet travelers. They are also commonly used to operate genoa lead systems as well as many custom applications. Navtec will work with any marine hardware manufacturer to provide a cylinder that interfaces with their hardware to operate any double acting needs.



CYLINDER SIZE	CAP THREAD	ZERO STROKE LENGTH		WEIGHT STD ALUMINUM	
		in	mm	lbs + lbs/in stroke	kg + kg/cm stroke
-6	unf 2a	11,9	301	1,2 + 1	.55 + .02
-10	1 7/16-16	13,4	341	2,2 + 1	.97 + .02
-12	1 5/8-16	14,8	377	3,5 + 2	1,58 + .04
-17	1 7/8-16	15,1	384	4,3 + 2	1,93 + .04
-22	2 1/8-16	18,10	461	6,7 + 3	3,02 + .05
-30	2 5/8-16	18,9	481	11,1 + 5	5,02 + .09
-40	3 1/4-16	20,6	522	18,2 + 8	8,22 + .13
-48	3 1/4-16	20,6	522	18,1 + 8	8,22 + .13
-60	3 3/4-16	22,9	582	27,3 + 1,0	12,37 + .17
-76	3 3/4-16	22,9	582	27,2 + 1,0	12,36 + .17
-90	4 3/8-8	32,7	830	44,3 + 1,5	20,10 + .27
-110	4 7/8-8	33,2	843	64,8 + 1,7	29,39 + .30
-150	5 3/8-8	35,2	895	89,6 + 2,6	40,65 + .47

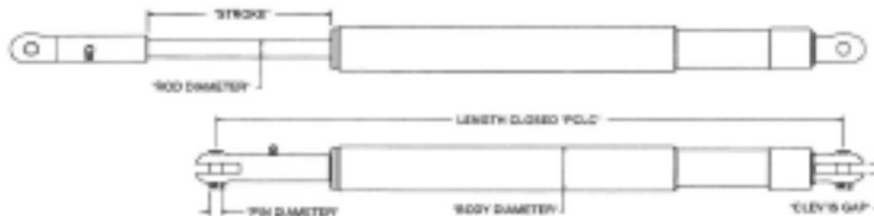
Max relief setting is 5,000 psi. See HP cylinder information for all other technical data. Cylinders are designed on an individual basis. Specify desired stroke when ordering. Overall cylinder length equals zero stroke length plus two times the desired stroke.



# NAVTEC FRANCE

## A850 Hydraulic Vang Cylinder

Navtec's Series 850 Vang features an extra-large piston rod to resist buckling with no tackle to clutter the deck layout. It also provides boom lift in light airs and acts as a topping lift when the sail is flaked. The A850 can be integrated with an A440 Push Button Quick Release Valve, proving the ability to instantaneously dump the vang when required.



VANG SIZE	MAX PULL FORCE @ RELIEF		RETURN FORCE		ROD DIAMETER		CLEVIS PIN & GAP	
	lbs	kg	lbs	kg	in	mm	in	mm
-6	1 935	880	475	220	5/8	15,9	7/16	11,1
-10	3 785	1 720	815	370	3/4	19,1	1/2	12,7
-12	5 100	2 310	1 100	500	7/8	22,2	5/8	15,9
-17	7 010	3 180	1 490	680	1	25,4	5/8	15,9
-22	10 265	4 660	1 935	880	1	25,4	5/8	15,9
-30	15 890	7 210	3 010	1 370	1 1/4	31,8	3/4	19,1
-40	25 670	11 640	4 330	1 960	1 1/4	31,8	7/8	22,2
-60	34 320	15 570	5 880	2 670	1 1/2	38,1	1	25,4
-90	42 340	19 210	7 660	3 470	1 7/8	47,6	1 1/4	31,8
-110	53 220	24 140	9 680	4 390	2 1/8	54	1 3/8	34,9
-150	65 370	29 650	11 930	5 410	2 3/8	60,3	1 1/2	38,1
-195	84 520	38 340	15 580	7 070	2 3/4	69,9	1 3/4	44,5
-260	109 090	49 480	20 110	9 120	3 1/8	79,4	2	50,8
-400	168 400	76 380	30 400	13 790	3 3/4	95,3	2 5/8	66,7

STANDARD VANG	POSITION INDICATING	STROKE		AVAILABLE PCLC		AVAILABLE PCLC	
		in	mm	MIN in	mm	MAX in	mm
A850-VC-006	N/A	9,00	228,6	46	1168	60	1524
A850-VC-010	N/A	9	228,6	55	1397	72	1829
A850-VC-012	N/A	9,50	241,3	55	1397	89	2261
A850-VC-017	A850-PI-017	9,50	241,3	56	1422	100	2540
A850-VC-022	A850-PI-022	10,00	254,0	58	1473	104	2642
A850-VC-030	A850-PI-030	11,00	279,4	61	1549	107	2718
A850-VC-040A	A850-PI-040A	12,00	304,8	70	1778	150	3810
A850-VC-060C	A850-PI-060A	14,00	355,6	78	1981	175	4445
A850-VC-090C	A850-PI-090A	16,00	406,4	85	2159	185	4699
A850-VC-110B	A850-PI-110	18,00	457,2	90	2286	190	4826
A850-VC-150A	A850-PI-150	18,00	457,2	99	2515	195	4953
A850-VC-195	A850-PI-195	18,00	457,2	110	2794	360	9144
A850-VC-260	A850-PI-260	18,00	457,2	98	2489	360	9144

# NAVTEC FRANCE

## Position-Indicating Vang Electrical

Originally developed for super yachts, this unique feature is now available on all Navtec vangs down to -22. The position indicating unit is essential for achieving the correct angle for the new furling booms that have become common on boats from 50 feet and up. The Position Indicating Vang can be interfaced with most marine electronics.

CABLE LENGTH		78,74	200
RESISTANCE (KΩ)		44	total span
RESISTIVE TOLERANCE		+/-20 %	
ACCURACY		STD	BEST
	mm	+/- .38	+/- .75
	in	+/- .015	+/- .30
POWER RATING (watts)		5,5@70°C	<u>0@125°C</u>
	°C		
OPERATING RANGE	°F	MIN	MAX
		-40	125
		-40	257

## A950 Hydraulic Super Yacht Vang (Carbon)

The Navtec Carbon Fiber Superyacht Vang delivers the same performance, reliability, and quality that owners and designers have come to rely on from the Aluminum and Stainless Steel models, but with a substantial weight saving. The longer the vang, the larger the weight saving, resulting in an easier vang to install and maintain.



PART NUMBER Carbon P/P PI	STROKE		AVAILABLE PCLC		AVAILABLE PCLC	
	in	mm	MIN in	mm	MAX in	mm
A950-PI-PP-090	16,00	406,4	88	2235	192	4877
A950-PI-PP-110	18,00	457,2	94	2388	198	5029
A950-PI-PP-150	18,00	457,2	100	2540	220	5588
A950-PI-PP-195	18,00	457,2	100	2540	220	5588
A950-PI-PP-260	20,67	525,0	105	2667	284	7214
A950-PI-PP-400	20,67	525,0	114	2896	300	7620

- Substantial weight saving over Aluminum and Stainless Steel Models
- Seamless, tapered, one-piece tube
- Smaller overall diameter than Aluminum and Stainless Steel models
- Carbon fiber weave or bespoke painted finish
- Available with push/pull or gas return options
- Position indicating feature available on request
- Both hydraulic connections for push/pull vang in oil jaw
- Custom clevis designs available for streamline connections

# NAVTEC FRANCE

## A850 Hydraulic Super Yacht Vang (alloy)

The Navtec Alloy Hydraulic Superyacht Vang features a coaxial feed through the rod so both the push and pull hydraulic connections are located on the oil jaw. In addition, the A850 vang can be equipped with the position indication function, to ensure that the correct angle for the furling boom is achieved.



PART NUMBER Alloy P/P PI	STROKE		AVAILABLE PCLC		AVAILABLE PCLC	
	in	mm	MIN in	mm	MAX in	mm
A850-PI-PP-090	16,00	406,4	88	2235	185	4699
A850-PI-PP-110	18,00	457,2	94	2388	190	4826
A850-PI-PP-150	18,00	457,2	96	2438	195	4953
A850-PI-PP-195	18,00	457,2	98	2489	360	9144
A850-PI-PP-260	18,00	457,2	105	2667	360	9144
A850-PI-PP-400	19,00	482,6	99	2515	360	9144

## Carbon Wrap Cylinders

The Navtec Carbon Wrap Cylinder complements the style aesthetic of the A950 Carbon Fiber Superyacht Vang. A thin carbon veneer tube is applied to an A250 Cylinder resulting in the same carbon finish as the larger superyacht vang. For the specification of the A250 cylinder, including the pull force, pin size, and rod size, please see pages 4-5.



# NAVTEC FRANCE

## Race Hydraulics

The Navtec Grand Prix hydraulic systems are designed to operate at pressures up to 7500 psi. Enjoying long standing relationships with multiple America's Cup winners, as well as high performance race fleets that include the Volvo Round The World Race and TP52s, the Navtec Grand Prix hydraulic Systems have a proven track record in performance excellence.

### Autoshift 7/8 Bore Hand Pump

Developed with America's Cup teams, the Navtec Autoshift 7/8 bore hand Pump provides a lightweight pump with increased flow. The latest version of the Navtec race pumps increases the size of the large bore pistons to 7/8" and the small bore pistons to 1/2", providing the maximum flow required for Grand Prix racing. Excess material is sculpted away, ensuring that the pump is as light as possible. Coupled with the A384 Race Valve, the Autoshift 7/8 Bore hand Pump is at the heart of Navtec race hydraulic systems.



PART NUMBER		WEIGHT		MAX PRESSURE		OUTPUT FLOW BELOW SHIFT POINT		OUTPUT FLOW ABOVE SHIFT POINT		PRESSURE PORT	SUCTION & TANK PORTS
		lbs	kg	psi	bar	in3/strk	ml/strk	in3/strk	ml/strk		
A020-03-01A	5/8" A/S HAND PUMP	4,15	1,88	5000	345	0,22	3,61	0,68	11,14	7/16" -20 JIC	3/8" HOSE BARB
A020-05-01A	LT TI 7/8" A/S HAND PUMP	3,54	1,61	7500	517	0,29	4,70	1,17	19,17	7/16" -20 JIC	3/8" HOSE BARB
A020-05-02A	LT SS 7/8" A/S HAND PUMP	3,88	1,76	7500	517	0,29	4,70	1,17	19,17	7/16" -20 JIC	3/8" HOSE BARB

### A634 Rotary Autoshift Pump

The A634 Rotary Autoshift Pump is the latest in the Navtec line of rotary pumps. The A634 is the ideal choice for the manual hydraulic system on Grand Prix race yachts with a pedestal winch system. The pump can be integrated with a Lewmar and Harken light-weight carbon pedestal system, providing an ergonomic way of producing the high flow rates needed to operate cylinders in the racing environment. Manufactured from high strength alloy with extra material sculpted away to achieve the lightest pump possible, the Navtec



	WEIGHT		INSTALLATION DIMENSIONS						OUTPUT FLOW*			
	lbs	kg	LENGTH		WIDTH		HEIGHT		LOW PRESSURE		HIGH PRESSURE	
			in	mm	in	mm	in	mm	gpm	lpm	gpm	lpm
2 BANK PUMP	5,51	2,5	10,4	264	3,6	91	7,6	193	0,8	2,9	0,2	0,9

CUSTOMER CONNECTIONS	LOW PRESSURE 3/8 & 1/2 BARB	HIGH PRESSURE 37° JIC 7/16-20
Fluid Requirement	ISO VG 15 or 32 hydraulic oil	
Maximum rotational Speed	200	rpm
Output pressure**	psi 7 500	bar 517

Optional splined input shafts accept Lewmar® winch handles.

- Theoretical output at 200 RPM. Typical overall efficiency is > 85 %

# NAVTEC FRANCE

## A384 7500psi Valves

---

### Standard Light Cam Valve

The Navtec Light CAM3-position valve is the standard valve for use with a single acting M cylinder. Each manifold-mounted 7500psi unit has an adjustable pressure relief valve, an optional flow control valve, and a non-interconnect check valve. The check valve is designed to prevent interconnection between two open valves which are controlling different cylinders. Excess material has been meticulously sculpted from the valve blocks, result in in an incredibly lightweight solution. An optional flow control limits the cylinder release rate without restricting the pumping flow, resulting in a slow release rather than shock loading the rig. This is ideal for checkstay and jumper strut cylinders.

### Light 4-Way CAM Valve

The Navtec light 4-way CAM valve is designed to operate the double-acting cylinders typically used in traveler, lead puller, centerboard, and push/pull applications. The unit includes separately adjustable relief and flow control valves.



## M CYLINDERS

---

The Navtec ultra-light, custom 7500 psi M Cylinder delivers maximum muscle where it is needed most on the world's top racing yachts. The standard on TP52s, IRC designs, and high-performance race yachts, the M Cylinder has helped drive America's Cup class winners since 1992.

By designing a cylinder that operates at 7500 psi rather than the standard 5000 psi or the heavier 10,000 psi, Navtec have improved the hydraulic working performance. Higher pressure results in faster performance alongside a reduction in size and weight. Machined from one long bar with an integral cylinder end fitting, weight has been reduced by eliminating the need for a mechanical end fitting. Eliminating the need for seals at the cylinder end has reduced the overall length. Machining the cylinder from a solid bar means that an unlimited number of end fittings can be incorporated, including clevis, jaw, eye, lashing eye, and threaded.

For the America's Cup yachts, the Navtec cylinder is machined from a high-strength 7000 series aluminum material, while a more marine stable 6000 series aluminum is used for grand prix race yachts where longer life span is required. While the 6000 series aluminum increases the weight of the cylinder by approximately 6 %, the life span increases from 2-3 years to 6-8 years without compromising on performance.

The M Series Cylinder integrates with the Navtec 7500 psi Valve, providing a sophisticated hydraulic system that delivers the highest level of performance.

# NAVTEC FRANCE

## A284 M-Cylinders



CYLINDER SIZE	ROD THREAD	ROD DIAMETER		PIN & GAP		TUBE OD		MAXI PULL LOAD*		MAXI PUSH LOAD**	
		lbs	kg	in	mm	in	mm	lbs	kg	lbs	kg
M19	5/16 - 24	31/99	8,0	3/8	9,5	1,07	27,2	2 980	1 350	3 600	1 635
M25	03/08/2024	3/8	9,5	7/16	11,1	1,37	34,8	5 100	2 315	5 910	2 680
M33	7/16 - 20	38/87	11,1	1/2	12,7	1,79	45,5	9 010	4 090	10 220	4 635
M39	01/02/2020	1/2	12,7	5/8	15,9	2,08	52,8	12 320	5 590	13 720	6 225
M45	05/08/2018	5/8	15,9	5/8	15,9	2,42	61,5	16 320	7 405	18 620	8 450
M52	11/16 - 16	64/93	17,5	3/4	19,1	2,76	70,1	21 430	9 725	24 240	11 000
M64	13/16 - 16	13/16	20,6	7/8	22,2	3,43	87,1	33 750	15 315	37 670	17 090

## M Series Vang

The M Series Vang incorporates an M Series Cylinder with a carbon fiber / Kevlar extension tube to produce a unit that operates in the same way as the Navtec light Vangs. The standard version uses an internal tie rod to carry the tension loads, while a gas-charged option is available where return pressure is required. Removing the tie rod reduces weight, with the carbon/Kevlar tube carrying both the tension and compression loads. In this instance, the tube is glued permanently to the cylinder and the clevis. The Navtec M52 Vang is suitable for use in predominately light sailing conditions, while the Navtec M64 Vang is suitable for use on larger boats where the loads are higher.





# NAVTEC FRANCE

## Hydraulic Plumbing Spares

Navtec can provide all your hydraulic needs by offering a full line of hydraulic hose and fittings needed to plumb Navtec systems. Contact your Navtec agent for assistance in plumbing your system.



PART NUMBER	DESCRIPTION
<b>Low Pressure hose</b>	
HO-008	3/8" Low Pressure Hose/Ft
HO-009	1/2" Low Pressure Hose/Ft
<b>High pressure Hose</b>	
HO-001	3/16" KEVLAR HOSE/Ft
HO-002	1/4" KEVLAR HOSE/Ft
HO-003	3/8" KEVLAR HOSE/Ft
HO-005	3/16" NAVTEC SPECTRA HOSE/Ft
<b>Deck Gland</b>	
A900-A01	3/16" THRU DECK GLAND
A900-A09	1/4" THRU DECK GLAND
A900-A11	3/8" THRU DECK GLAND
<b>Swage End Cadmium</b>	
HB-016	3/16" HOSE 1/4"37^JIC Swage End
HB-018	1/4" HOSE 1/4"37^JIC Swage End
HB-020	3/8" HOSE 3/8"37^JIC Swage End
<b>Swage End Stainless Steel</b>	
HB-017	3/16" HOSE 1/4"37^JIC Swage End
HB-019	1/4" HOSE 1/4"37^JIC Swage End
HB-020-01	3/8" HOSE 3/8"37^JIC Swage End
<b>Gauges</b>	
A060-01-00	1 1/2" GAUGE SR#7 INTGRL & SYST V
A060-02-03	2" GAUGE SYSTEM 50
HC-077-06	LE INTEGRAL GAUGE SERIES 8 AND 9
<b>Filter</b>	
HO-012	Lg In-Line Filter (for 3/8"H)
HO-011	Sm in-Line Filter (for 1/4" H)

PART NUMBER	DESCRIPTION
<b>Misc Fittings And Connectors</b>	
HB-093	1/4".37^JIC CAD Plug
HR-020	1/4".37^BRASS Cap
HC-074	air Valve ASSY
HB-085	1/4".37^Cad STRAIGHT Union
HB-088	1/4".37^Cad "T" Union
HB-078	1/8"NPT 1/4-37^JIC CAD StrConn
HB-068	1/8"NPT 1/4-37^JIC CAD ELBOW
HB-066	1/8"NPT 1/4-37^JIC CAD LONG ELBOW
<b>Misc Stainless Fittings and connectors</b>	
HB-086	1/4"-37^SS STRAIGHT Union
HB-089	1/4"-37^SS "T" Union
HB-079	1/8" NPT 1/4-37^JIC SS StrConn
HB-069	1/8"NPT 1/4-37^JIC SS ELBOW
HB-335	1/8" NPT 1/4-37^JIC SS LONG ELBOW
<b>Hose Barb Fittings</b>	
HB-025	125HBL-6-2 Hose Barb Straight
HB-027	125HBL-6-4 Hose Barb Straight
HB-022	1/8" NPT Male x Female Elbow
HB-242	3/8" Plastic Hose Barb "T"
HB-126	5/16" ID Hose Clamp (Low Press)

# NAVTEC FRANCE

## Hydraulic Spares Handle Holder

Auto-shift Pump handle # : A031-11  
 Two-speed Pump handle # : A021-A11  
 One-speed Pump handle # : A031-A11  
 Integral Pump handle # : A371-A25  
 Handle Holder # : A021-24-01



## A440 Push Button Quick Release Valve

The Navtec “Panic Button” has proven to be a popular component of a hydraulic vang system. By locating the Quick Release Valve away from the central control panel, the crew has control of the vang release from any desired position on the boat. Easy to operate, the valve is only released when the button is held down, meaning that it cannot be left open. Available with different plunger lengths for different panel thicknesses, the valve is easy to mount and watertight. When a hydraulic vang is integrated with a Quick Release Valve and a -6 hose, it achieves the responsiveness of a mechanical vang with the added benefit of the additional mechanical performance gained from a hydraulic system. The Push Button Quick Release Valve can be used with a hydraulic outhaul.



## Pump Seal & Repair Kits

A020-SK-01	Seal Kit, Manual Two Spee Pump
A020-SK-02	Seal Kit, Auto shift Pump
A020-RK-01	Repair Kit,Manual Two speed Pump
A020-RK-02	Repair Kit, Lt Auto shift Pump
A020-RK-02A	Repair Kit, Lt Auto shift Pump w/ deep piston seals
A030-SK-01	Seal Kit, One Speed Pump
A030-RK-01	Repair Kit, One Speed Pump

## Sys V and 50 Valve Seal Kits

A280-SK-02	Seal Kit, Systems 50 Valve Block
A310-SK-01	seal Kit, System V Valve
A400-01-SK	System 50 Selector Vale Seal kit
A400-01-RK	Repair Kit, 5 -W HF Sel Valve

## FAC and CAM Valve Seal & Repair Kit

A340-SK-01	Seal Kit, 5000/7500 FAC Valve
A340-RK-01	Repair Kit, 5000/7500 FAC Valve
A350-SK-01	Repair Kit for 2-way CAM Valve
A350-RK-01	Repair Kit for 2-way CAM Valve
A350-SK-02	Seal Kit, SYS 8 AC CAM Valve
A350-RK-02	Repair Kit,SYS 8 AC DCAM

## A440-A-01A Seal Kit

A440-SK-01	Seal Kit, Push Button Quick Release Valve
------------	---

## Cylinder Seal Kits

A250-CSK-006	Seal Kit, -6 Cylinder
A250-CSK-010	Seal Kit, -10 Cylinder
A250-CSK-012	Seal Kit, -12 Cylinder
A250-CSK-017	Seal Kit, -17 Cylinder
A250-CSK-022	Seal Kit, -22 Cylinder
A250-CSK-030	Seal Kit, -30 Cylinder
A250-CSK-040	Seal Kit, -40 Cylinder
A250-CSK-060	Seal Kit, -60 Cylinder

## Vang Seal Kits

A850-SK-006	Seal Kit, -6 Vang
A850-SK-010	Seal Kit, -10 Vang
A850-SK-012	Seal Kit, -12 Vang
A850-SK-017	Seal Kit, -17 Vang
A850-SK-022	Seal Kit, -22 Vang
A850-SK-030	Seal Kit, -30 Vang
A850-SK-040	Seal Kit, -40 Vang
A850-SK-060	Seal Kit, -60 Vang
A850-SK-060B	Seal Kit, -60B Vang

## Integral Seal Kits

A370-SK-010	Seal Kit, -6/10 Integral, Series 7
A370-SK-017	Seal Kit, -12/17 Integral, Series 7
A370-SK-022	Seal Kit, -22 Integral, Series 7
A370-SKLE-010	Seal Kit, LE Integral, -6/-10 Series 8
A370-SKLE-017	Seal Kit, LE Integral, -12/-17 Series 8
A370-SKLE-022	Seal Kit, LE Integral, -22 Series 8
A370-SKS9-010	Seal Kit, SER9 Integral, -6/-10
A370-SKS9-017	Seal Kit, SER9 Integral, -12/-17
A370-SKS9-022	Seal Kit, SER9 Integral, -22