SIMRAD

70 YEARS

1947-2017

Sonars

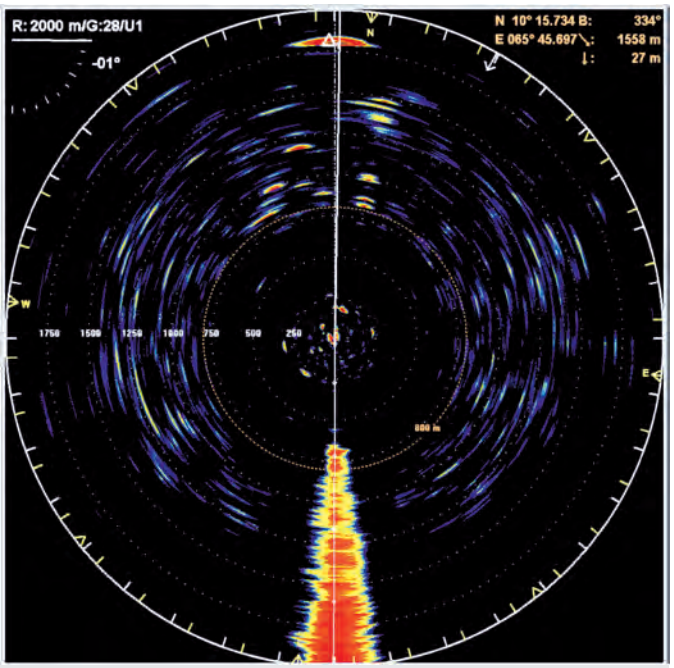
TECHNOLOGY FOR SUSTAINABLE FISHERIES

SIMRAD SU90 SONAR

The SU90 Sonar is made with no compromises. The number of channels has been increased by 50% compared to the SX90 Sonar giving the sonar an even better performance in selectivity and range. Its operational frequency is 20 to 30 kHz. The narrow opening angle (4,9° at 30 kHz) and the increased source level (3dB) makes the SU90 the most powerful and highest resolution low frequency sonar on the market today.

The narrow beam makes the SU90 even more ideal for searching fish close to the bottom or close to the surface at long ranges. Also it will give a far better vertical view with less “bottom climbing” that is seen on sonars with a wider beam. The SU90 is equipped with the celebrated signal processing seen on the SX90 such as Hyperbolic FM transmission giving the user a clutter free picture with very high resolution in range.

The higher source level (3dB higher than SX90) will increase the detection range and enhance the detected echoes in general. How much longer range is almost impossible to calculate as temperature layers, salinity, bottom hardness, target strength and sea conditions will never be the same for a good comparison. However, the sonar will have a longer range than the SX90.

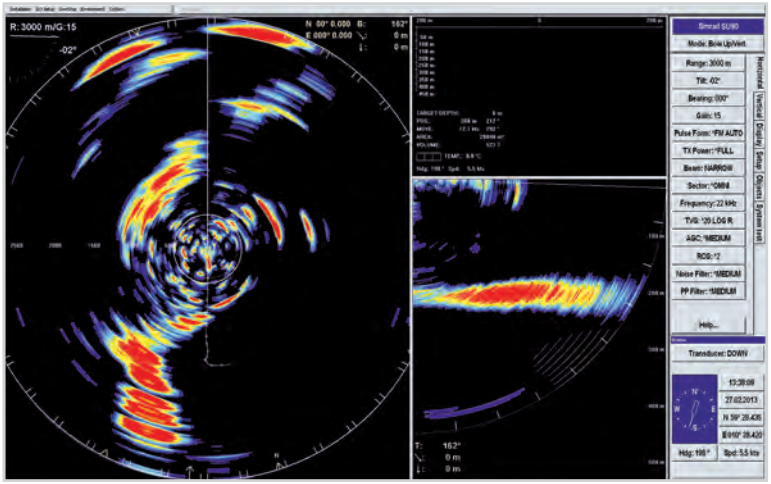


SU90 Sonar Ultimate!

When high performance is the only criteria, such as long range, high resolution, narrow beam high source level, the SU90 is the sonar for you. We have made no compromises, only had performance in mind when designing the sonar.

HIGH POWER. HIGH RESOLUTION. NARROW BEAM. NO COMPROMISE.

The SU90 is the latest omni sonar from SIMRAD. It is the 4th generation windows operated sonar. SIMRAD will now have two low frequency sonars on the market, the highly acclaimed SX90 and the new implacable SU90 for customers who place performance before price.



1

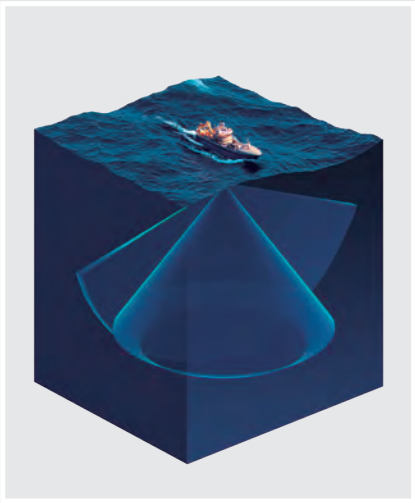
TILT AND GAIN

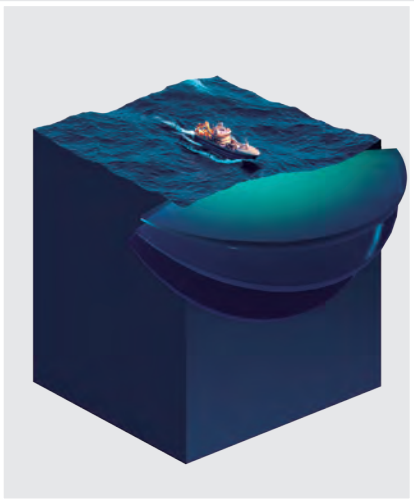
The tilt of the horizontal beam the information on the left top part shows gain setting.

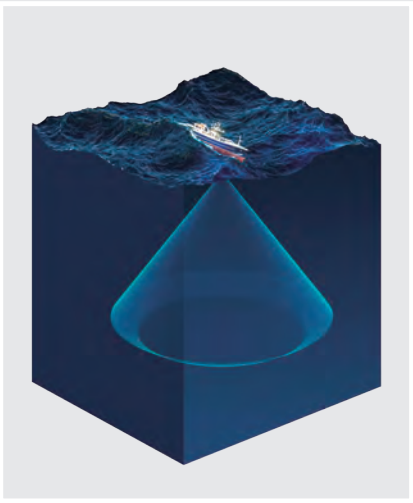
2

PURSE SEINE AND TARGET INFORMATION

This window displays information from depth sensors, shows target depth and estimated school size.







HORIZONTAL AND VERTICAL BEAMS

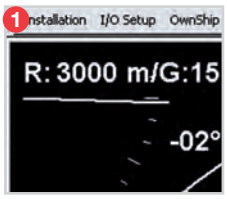
The combination of vertical and horizontal presentations shows the schools of fish both from above and from the side at the same time. It is not necessary to go over the target to see the vertical distribution on the echosounder.

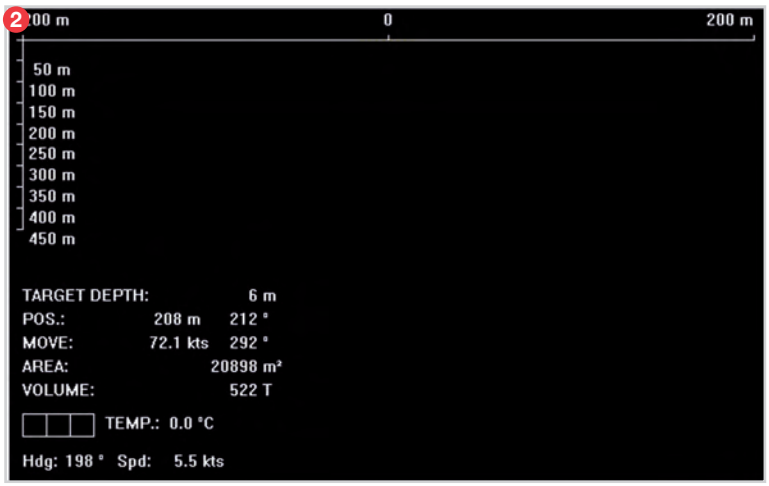
BOW UP/180° VERTICAL

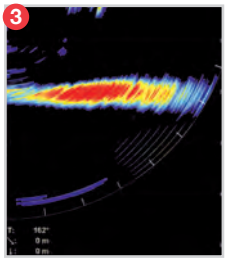
The vertical slice is made “tippable”, and by selecting a 60° tip angle (or less), a full 180° coverage is obtained. The tip angle can be adjusted from +10 to -90°. This mode is ideal when you are trawling for fish on deep water.

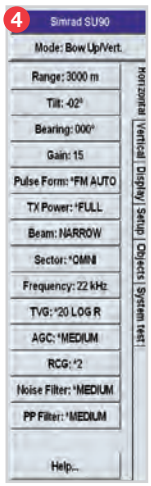
BEAM STABILIZATION

When the beam stabilizer is activated, both the horizontal and vertical beams are electronically stabilized for roll and pitch. The full circle beam stays on the target independent of the vessel movement, even in rough seas.









3

THE VERTICAL VIEW

On the SU90 the vertical view is even more useful as the narrow beam will avoid “climbing bottom” problem found on sonars with wider beams. This is extra beneficial when searching for fish close to the bottom.

4

THE MENU

The menu is the same as on all SIMRAD Sonars, easy to use and well organized with the most needed functions easy available. You can choose up to 12 different languages.

5

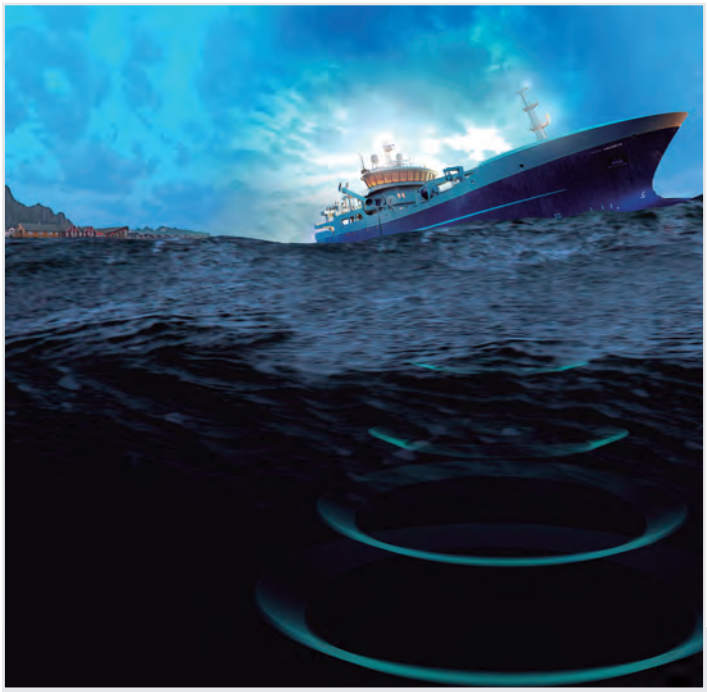
Navigation information and hull unit position information.

SIMRAD SX SONAR

USER SELECTABLE FREQUENCIES BETWEEN 20 - 30 kHz PREVENT INTERFERENCE FROM OTHER VESSELS

The SX90 is a low frequency, high-definition, long range sonar that utilizes the latest high-end computer to process data from the transducer. The SX90 is specially designed for vessels where high resolution combined with long range is needed. With the state of the art processor there are several unique possibilities for advanced signal processing. Three different vertical beam widths, single or dual vertical view and 180° tiltable vertical view are available. At 30 kHz operating frequency, the vertical beam width is only 7,1°.

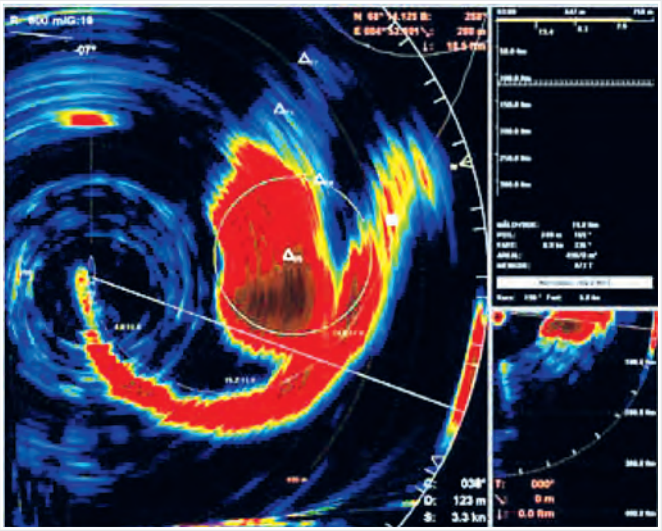
The Simrad SX90 Sonar offers unique features such as full circle beam stabilization for easier fish detection in poor weather and 11 different sonar operating frequencies with 1 kHz separation to avoid interference from other sonars. The long range and higher definition of the SX90 will improve your catching abilities and help you make better use of your time at sea. Great emphasis has been placed on giving the best possible overview in the search and catch situation. In addition, full screen echo presentation, resizable windows, off center, zoom and dual operation are standard functions on all sonar models. You can evaluate one school while tracking two other targets, giving you full control of schools and net from detection to catch.



Multi frequency 20 to 30 kHz!

Fishing in the same area as others can be a challenge as other vessels might have sonars transmitting on the same, or close to the frequency you are using. With multi frequency from SIMRAD you are able to tune your sonar for maximum performance and avoid interference from other vessels. With 11 different frequencies with 1 kHz separation, interference is no longer a problem.

Only a wideband transducer can be used to be able to transmit and receive at such a wide spread band of frequencies. SIMRAD designs and produces our own transducers for this purpose.



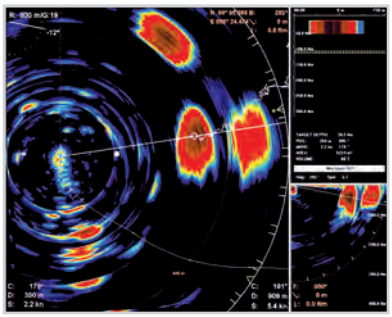
OFF CENTER PRESENTATION

Offset the vessel to any screen position and enlarge the echoes for more detailed information.

SCREEN RECORDINGS FROM SIMRAD SX90 SONAR

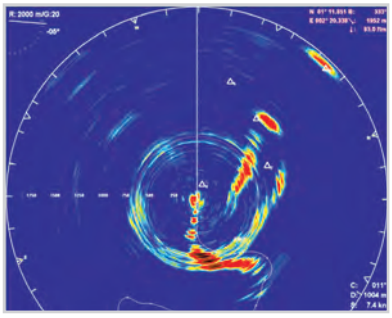
HERRING

On this picture, the sonar has detected three schools of herring. The skipper has decided to catch the school with highest density. The closest school has the most density. The sonar is in “Automatic Target Tracking” mode and shows the track from the school and vessel. In the lower left corner numbers show the school’s traveling course and speed. (2,2 knots and 179°)



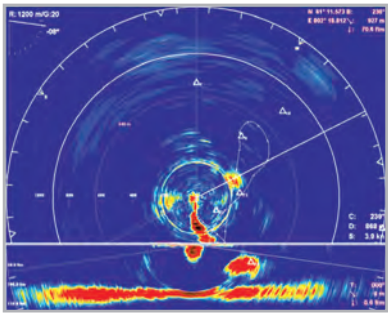
MACKEREL

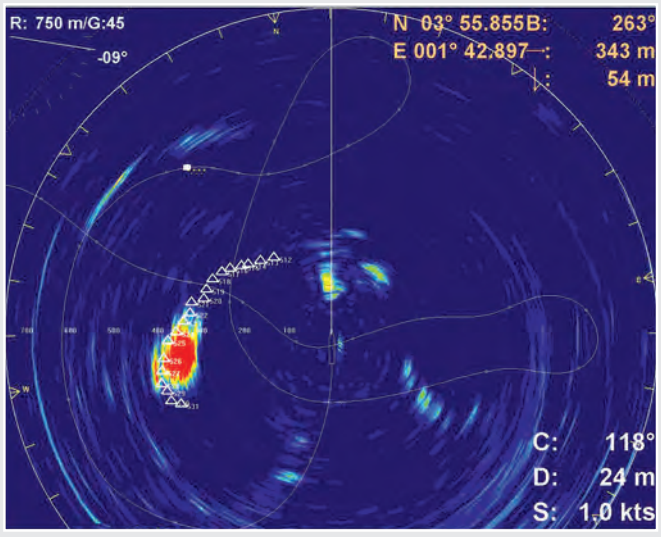
School of mackerel detected at 40° starboard and marked as “6”. Sonar is operated in “Bow Up” mode with “Full Screen”. Range is 2000 meter and tilt is set at 5°. Range to school is 1952 meter and depth is indicated to be 93 fathoms saying that the mackerel school is on the bottom. Echoes between the mackerel and the vessel is wake from pair trawlers coming towards the vessel.



MACKEREL

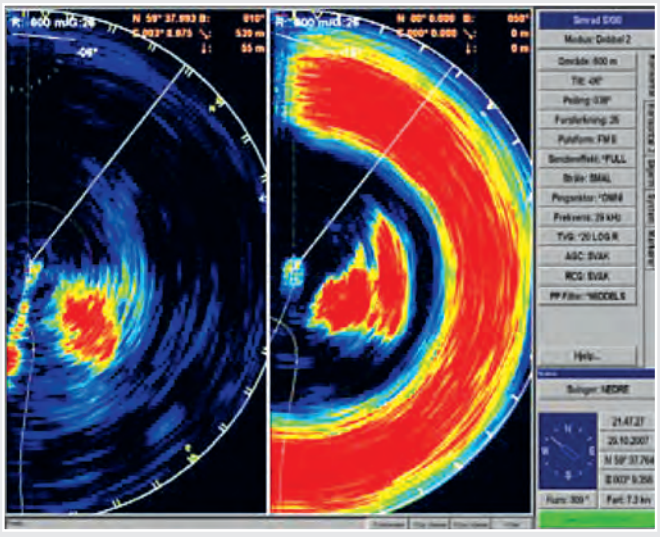
This is later in the same scenario as above. The vessel is close to the school of mackerel only about 250 meters away. “Bow Up/180°” Vertical” is used. The vertical view shows the school at about 50 fathoms depth. The variation in bottom shows uneven spots with hard and soft bottom.





FULL SCREEN PRESENTATION

In full screen presentation, the echo presentation will be extended to cover the entire display area.



“TWO SONARS IN ONE”

In the dual mode, each sonar presentation can be set up as if you were using two different sonars simultanously. Individual frequencies, tilt angles, ranges, gain and filters can be used.

SC90, THE WORLD'S FIRST COMPOSITE OMNI SONAR

As the industry first, again, SIMRAD presents the SC90 composite sonar. The composite omni transducer is a result of SIMRAD's continuous improvement of its transducer design, material and production method.

The composite transducer is more complicated to produce than traditional transducers with large investments in the production line. Today, SIMRAD has one of the most sophisticated transducer production line and design department in the industry.

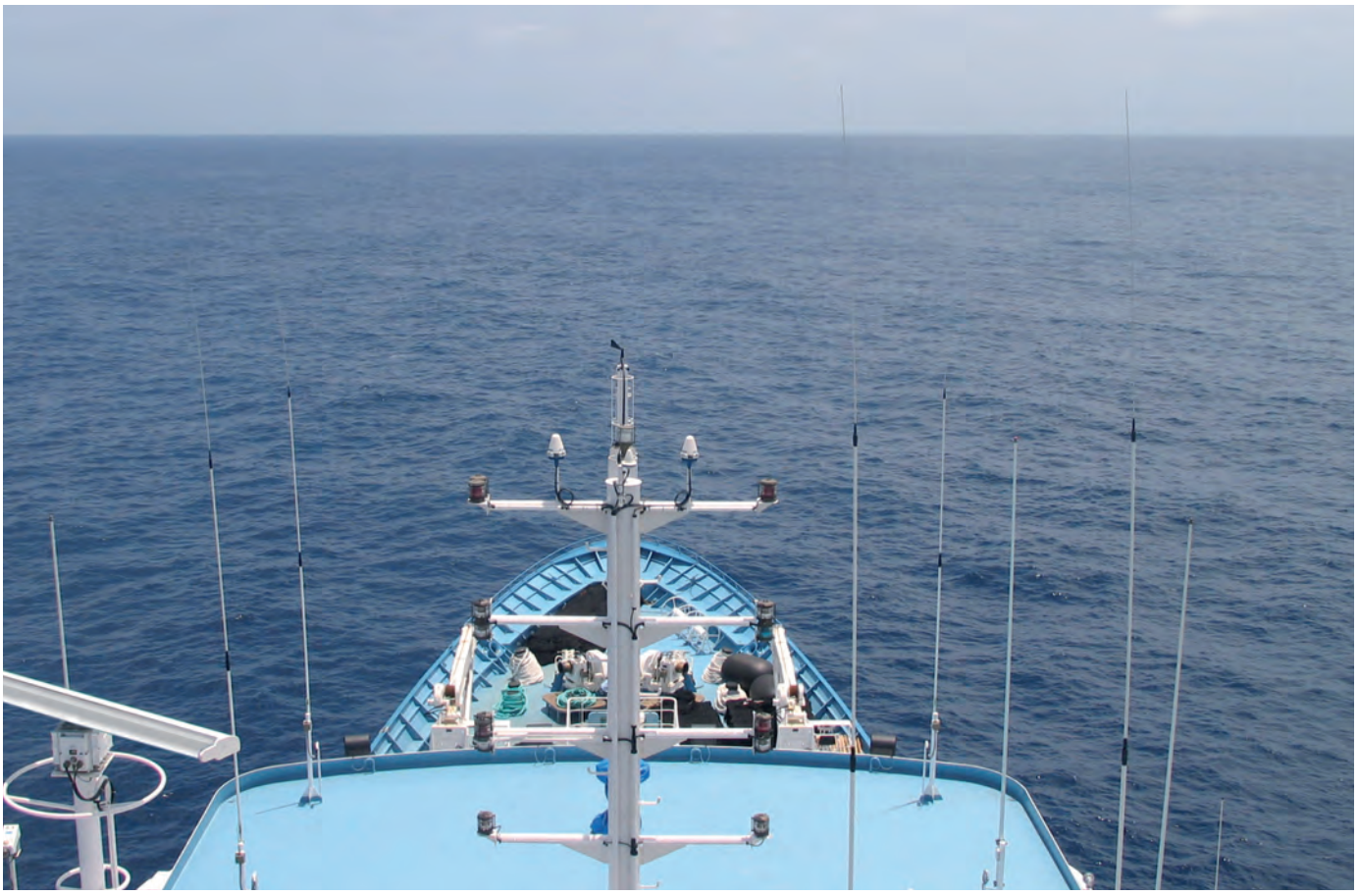
The advantage of a composite transducer is first and foremost its efficiency compared with other materials and production methods. More of the power put into the transducer during transmission is converted to sound in water and more is also converted back to electricity with the return echo. The more efficient a transducer is the more powerful the equipment connected to it will be.

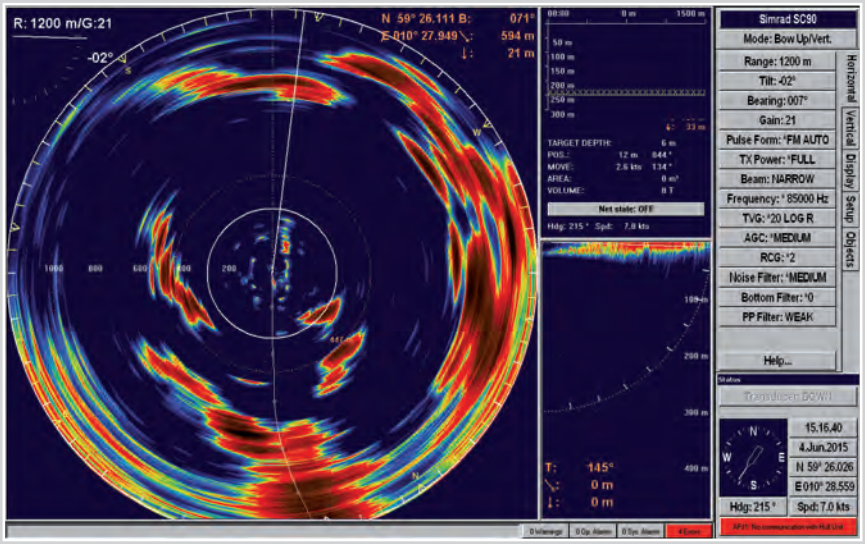
A composite transducer will also be able to transmit on a wider frequency band, giving many future possibilities for the SC90 to transmit on several frequencies and also wideband chirp transmission.

The SC90 is a 85 kHz mid frequency sonar with high efficiency, high power transmission. The SC90 is ideal for fish like Tuna, Mackerel, Herring and fish close to surface, bottom or close to the vessel. It comes with all the standard Simrad features such as FM transmission, fully 360° stabilized, vertical view, easy operation, dual mode, 60° tilt and clutter free picture.

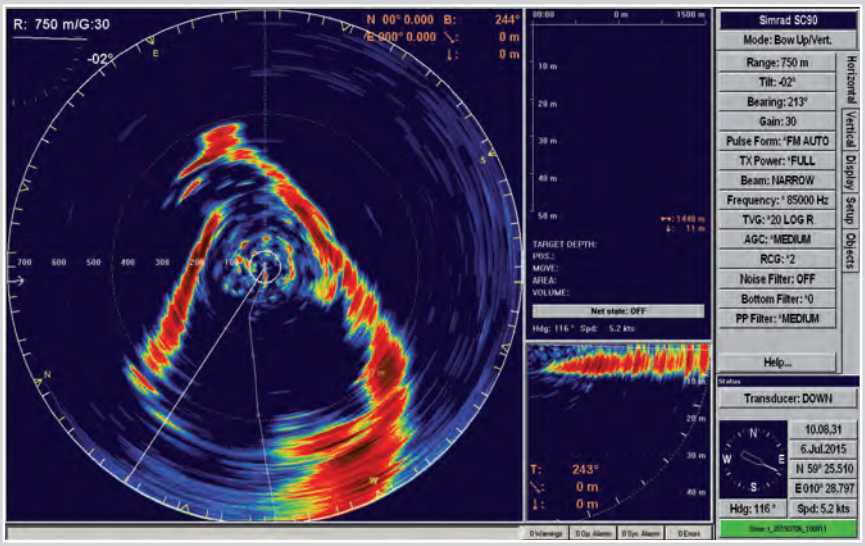
If you have today a Simrad SH90 sonar, the upgrade path is short and easy. A change of transducer, computer and transceiver PCBs (printed circuit boards) are all that is needed avoiding the change of the big and heavy hull unit, transceiver cabinet, cabling, etc. This fits right into the long SIMRAD strategy for our existing customers; if you have a Simrad sonar it should always be as easy and cost efficient as possible to have the latest development and technology regardless when you bought the sonar.

The SC90 makes a perfect partner to the low frequency sonars SX90 or SU90. Follow the school from long range all the way into the vessel. With the range capabilities of the SC90 it is also a perfect backup if something happens to the low frequency sonar, like impact to the transducer or strike by the purse seine wire.

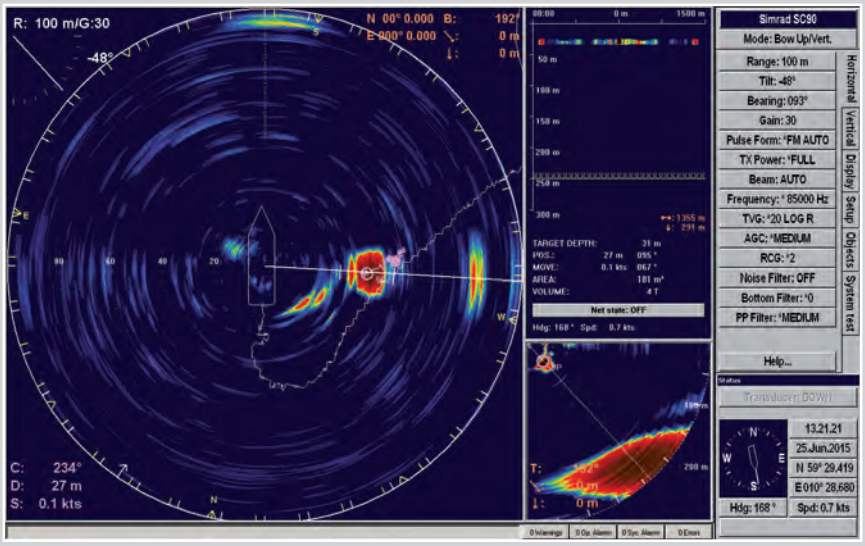




The SC90 has range capabilities that will make it a perfect back-up sonar as well as a stand-alone search sonar. Combined with a low frequency sonar you will be able to follow the school all the way in to the vessel. The resolution on the SC90 is unmatched for the frequency and the composite transducer will give you all the power needed to detect even the weakest targets.



The completely noise free capability of the SC90 makes it easy to see wanted targets and avoid spending time interpreting the sonar picture. Even in shallow water, the picture is clean and easy to understand.

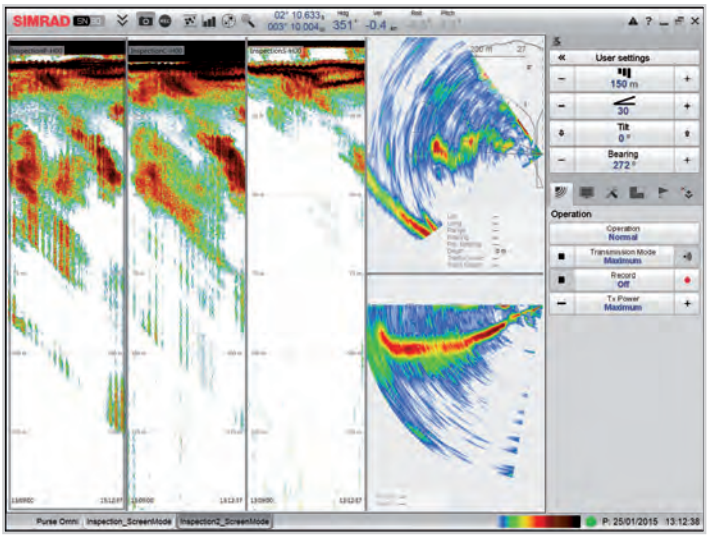


In short range, which is the reason to have a second sonar, the sharp well defined echoes due to the very high resolution are important. Like in the case to the left, it is very useful to have a well defined “backside” of the school, especially for purse seiners, in order to get a general feeling of the size of the school before setting the net.

SIMRAD SN90 SEINE SONAR. FULL CONTROL BEFORE AND DURING THE SETTING OF THE NET

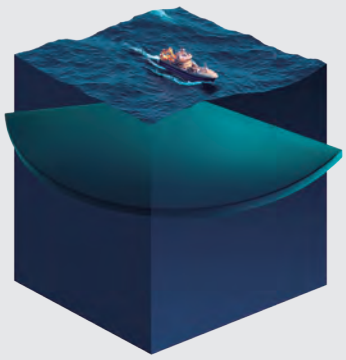
The game-changing SN90 Sonar is the latest development from SIMRAD. With the SN90 the user will get full control over the setting of the seine without having to care about retracting the hull unit. The SN90 transducer can be installed without a retractable hull unit to the side of the keel facing the purse seine. The 256 individual beams have a horizontal coverage area of 160° and the vertical beam width is typically 6° (varies with the frequency from 5° to 8°). The beams are tiltable from 0° down to 90°.

In addition to this, five steerable inspection beams of 5°x5° can be used for more detailed inspection of a school like observing fish behaviour, target strength and biomass. This will enable the fisherman to run alongside a school of fish and observe, like a horizontal echosounder, and analyse the school without passing over it. Fish avoidance is then minimized and more information about the fish in the school will reduce the bycatch, unwanted species in addition to catch the correct school size and conduct volume estimation of the school before setting the net.

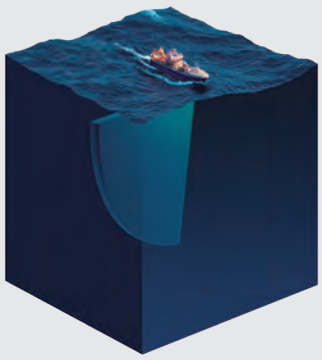


Up to five inspection beams (three shown here) can be trained and tilted individually while maintaining the overview with the horizontal fan and vertical slice.

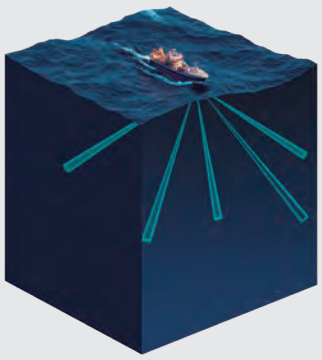
Installed looking to the port side of the vessel together with horizontal looking ES70 echosounders previously installed.



The SN90 has a 160° fan that is tiltable from 0° down to 90°. This will enable to see the purse seine during the whole setting of the net.



The SN90 has one vertical slice that can be trained in any direction within the fan. This will give full control of the edges of the school during setting of the net.

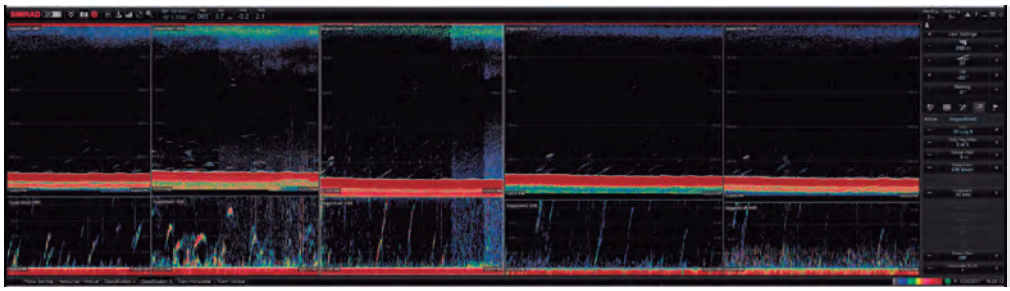


The SN90 has five individually steerable inspection beams that can be trained and tilted with any frequency between 70 and 110 kHz. The inspection beam will give a detailed high resolution echogram.

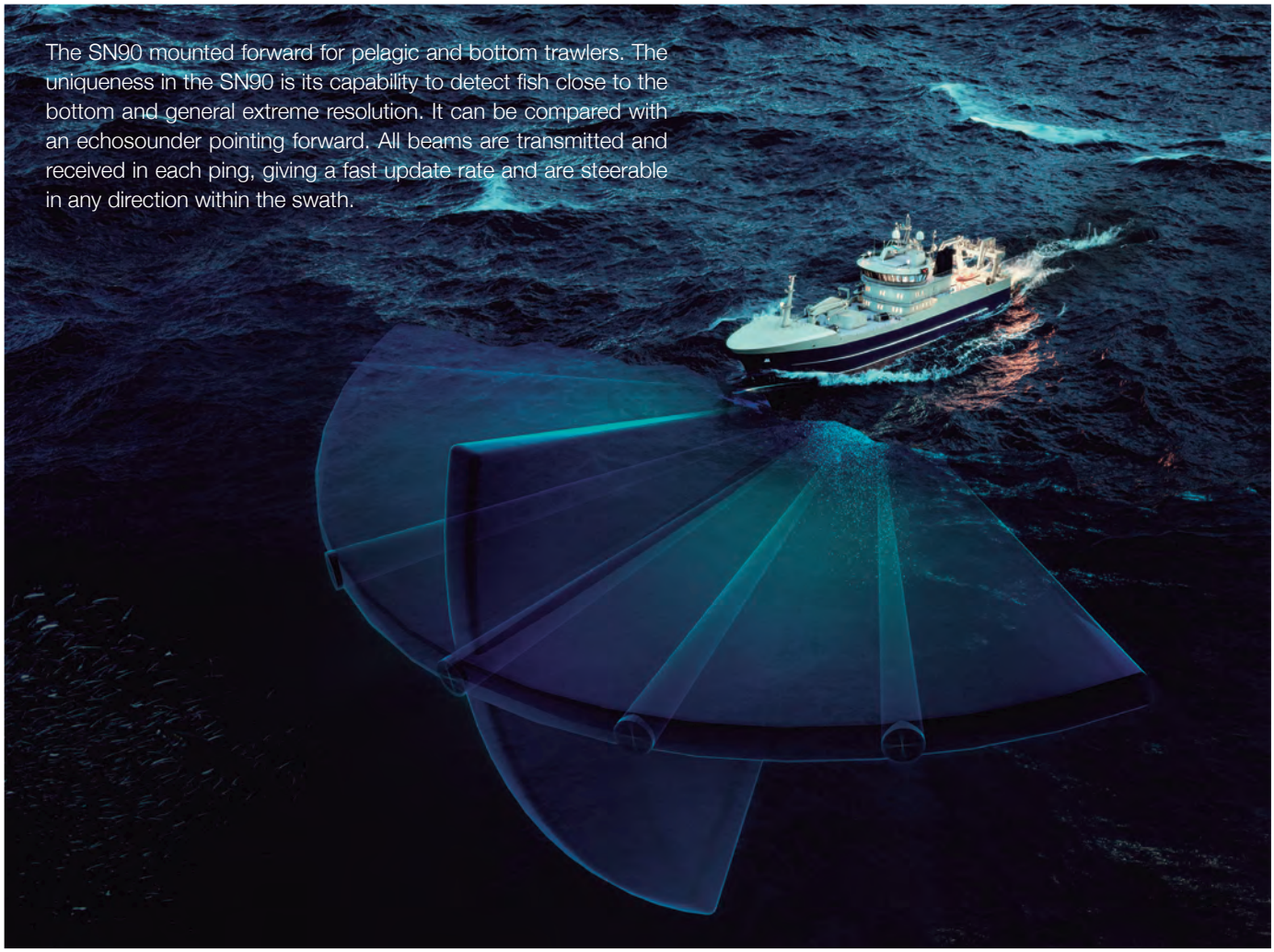
SIMRAD SN90 TRAWLING SONAR. THE ULTIMATE TOOL FOR ANY TRAWLER!

Simrad SN90 can be configured as a forward looking multibeam sonar for trawlers. The unique flexibility of the SN90 enables it to be used at almost any fishery depending on how the transducer is installed. Mounted forward looking the SN90 can be used as a trawling sonar. The display software is then oriented forward during installation. The SN90 transducer can be fixed to the hull or bulb like a regular echosounder's transducer or mounted on a hull unit when fishing in ice or other hazards. The sonar beams are pointing forward only in a 120 degree swath, taking the propeller noise out of the equation.

A full vertical slice as well as five inspection split beams can be individually trained and tilted to the user's needs. Stack the five beams on top of each other or spread them out to inspect to any side. A bottom detector and bottom expansion has been included in the presentation of the 5 inspection beams. This will enable the user to detect fish close to the bottom forward of the vessel and have more time to decide before the fish reaches the trawl. The SN90 is a chirp wideband sonar/echosounder transmitting and receiving between 70-110 kHz.



The picture to the left is from F/V "Ramoen" using five inspection beams forward with bottom lock and bottom expansion. This makes it easier to turn onto the fish even if they are close to the bottom.



The SN90 mounted forward for pelagic and bottom trawlers. The uniqueness in the SN90 is its capability to detect fish close to the bottom and general extreme resolution. It can be compared with an echosounder pointing forward. All beams are transmitted and received in each ping, giving a fast update rate and are steerable in any direction within the swath.

SONARS SPECIFICATIONS

	SX90	SU90	SN90	SC90
PROCESSING UNIT				
Voltage	110/220 VAC			
Consumption	5 A			
Processor type	ENIX4	ENIX4	ENIX8	ENIX4
Operating system	Windows XP			
Display output	Dual			
Serial interface I/O	Four serial ports			
Ethernet interface	Two			
Display resolution	1280 x 1024			
Operating ranges	150 to 4500 m*	150 to 4500 m*	50 to 2000 m	50 to 2000 m
TRANSCEIVER UNIT				
Voltage	110/220 VAC			
Consumption	750 VA	750 VA	400 VA	750 VA
Operating Frequency	20 to 30 kHz (1 kHz step)	20 to 30 kHz (1 kHz step)	70 to 110 kHz	85 kHz
Modulation	CW and Hyperbolic FM	CW and Hyperbolic FM	CW and Hyperbolic FM	CW and Hyperbolic FM
BEAM				
Horizontal coverage	Omni	Omni	160°	Omni
Vertical Tilt	+10° to -90°	+10° to -90°	+10° to -60°	+10° to -90°
Vertical beam width	See table below	See table below	6,0°	8,0°
Transceiver channels	256	384	256	480
Pitch & Roll Stabilisation	Included			
External Pitch & Roll interface	MRU Kongsberg Seatex format (Optional)			
Scientific Data Output	Optional			
HULL UNIT				
Voltage	230/380/440 VAC 3 Phase	230/380/440 VAC 3 Phase	N/A	230/380/440 VAC 3 Phase
Consumption	3000 VA - 1100VA	3000 VA - 1100VA	N/A	1100 VA
Selectable Transducer Position	Yes	Yes	N/A	Yes
20 knots hull unit	Yes	No	N/A	Yes
1.6m Transducer lowering	SX93 Hull Unit	SU93 Hull Unit	N/A	N/A
1.2m Transducer lowering	SX92 Hull Unit	SU92 Hull Unit	N/A	N/A
1m Transducer lowering	SX95 Hull Unit	N/A	N/A	Yes

*Optional extended range 6000 to 8000 m, requires export license in selected countries.

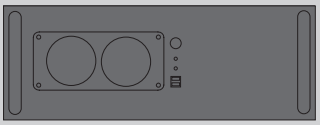
OPENING ANGLES ON SX AND SU SONARS

	SX90			SU90		
	WIDE	**NORMAL**	**NARROW**	**WIDE**	**NORMAL**	**NARROW**
20 kHz	14,8°	11,0°	10,7°	10,7°	7,8°	7,2°
21 kHz	14,1°	10,5°	10,2°	10,2°	7,4°	6,9°
22 kHz	13,5°	10,0°	9,7°	9,7°	7,1°	6,5°
23 kHz	12,9°	9,6°	9,3°	9,3°	6,8°	6,3°
24 kHz	12,3°	9,2°	8,9°	8,9°	6,5°	6,0°
25 kHz	11,8°	8,8°	8,6°	8,6°	6,2°	5,8°
26 kHz	11,4°	8,5°	8,2°	8,2°	6,0°	5,5°
27 kHz	11,0°	8,1°	7,9°	7,9°	5,8°	5,3°
28 kHz	10,6°	7,9°	7,6°	7,6°	5,6°	5,1°
29 kHz	10,2°	7,6°	7,4°	7,4°	5,4°	5,0°
30 kHz	9,9°	7,3°	7,1°	7,1°	5,2°	4,8°

PROCESSOR UNIT

Width: 600 mm
Height (with shock absorbers): 410 mm
Depth: 640 mm
Weight: 24 kg

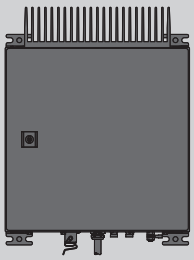
(Shipping dimensions)



POWER SUPPLY UNIT

Width: 600 mm
Height (with heatsink and brackets): 410 mm
Depth: 220 mm
Weight: 22 kg

(Shipping dimensions)



OPERATING PANEL

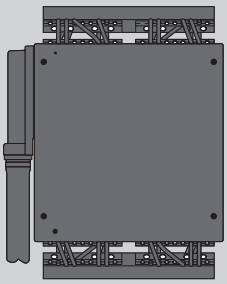
Width: 320 mm
Height: 230 mm
Depth: 51 mm
Weight: 4 kg

(Shipping dimensions)

TRANSCEIVER UNIT

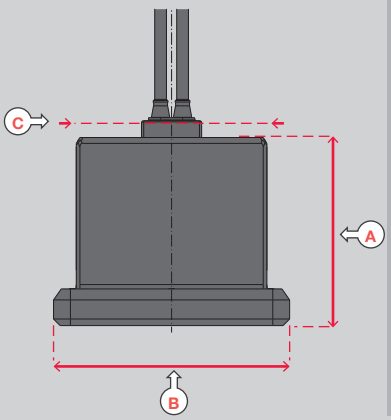
Width: 670 mm
Height: 760 mm
Depth: 580 mm (Excluding climate door)
Weight: 108 kg

(Shipping dimensions)

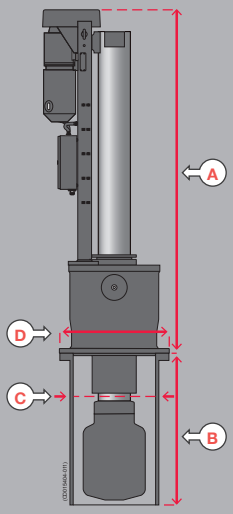


TRANSDUCER
SN

A. 256 mm
B. 322 mm
C. 260 mm

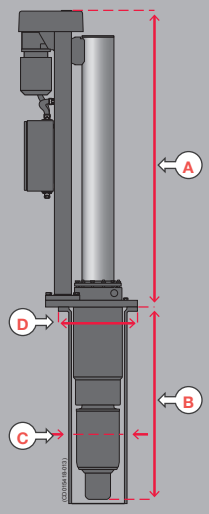


HULL UNIT
SX - SU



	(SX92/SX93/SX95)	(SU92/SU93)
A. Height over trunk:	SX92 - 2120 mm SX93 - 2520 mm SX95 - 1645 mm	SU92 - 2120 mm SU93 - 2520 mm
B. Height of trunk:	SX92 - 930 mm SX93 - 930 mm SX95 - 910 mm	SU92 - 1110 mm SU93 - 1110 mm
C. Trunk diameter:	SX92 - 610 mm SX93 - 610 mm SX95 - 508 mm	SU92 - 610 mm SU93 - 610 mm
D. Flange diameter:	SX92 - 761 mm SX93 - 761 mm SX95 - 580 mm	SU92 - 761 mm SU93 - 761 mm

HULL UNIT
SC



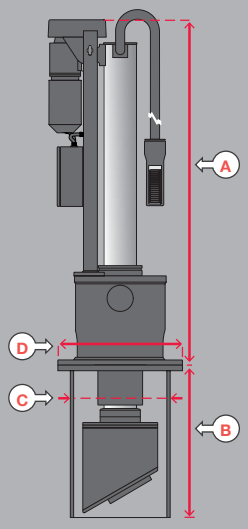
A. Height over trunk:
SC90 - 1390 mm

B. Height of trunk:
SC90 - 970 mm

C. Trunk diameter:
SC90 - 273 mm

D. Flange diameter:
SC90 - 370 mm

HULL UNIT
SN



A. Height over trunk:
SN92H: 2120 mm

B. Height of trunk:
SN92H: 930 mm

C. Trunk diameter:
SN92H: 610 mm

D. Flange diameter:
SN92H: 761 mm

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SEPTEMBER 2017 / 428599 / REV.A