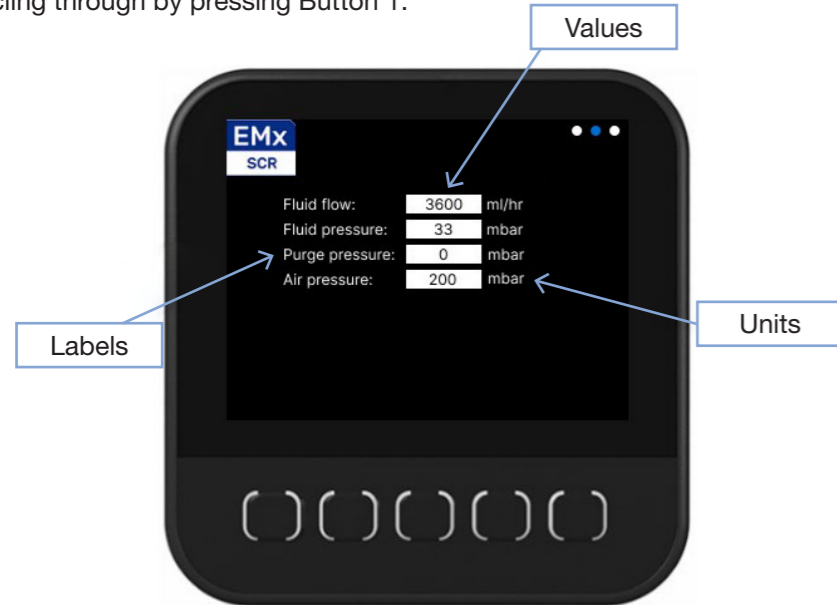


Operating

SCR Display sensor Page

The user can navigate to the Sensor page by pressing Button 2 or by cycling through by pressing Button 1.



Stopping the SCR system

Operating outside ECA (Emmission Control Area).

- Stopping the SCR can only be done from the main panel of the vessel.
- To stop the SCR reduce the engine load to 30%, wait at least 10 sec, then turn off the main SCR switch on the main vessel panel.
- To restart the SCR reduce the engine load to 30%, wait at least 10 sec, then turn on the main switch.
- The operator/owner is responsible for keeping a log of (Date, Time, and Location) every time the SCR is OFF and ON in the log file of the vessel.

NOTICE:

In accordance with IMO tier 3 (Regulation 5 of annex VI to MARPOL 73/78): It is the operator/owner responsibility to keep a log of the SCR alarms (Date, Time, and Location) to present it to local authorities in case of inspections.

See example:

Alarms log

Alarm	Date	Time	Location

It is mandatory to inform local authorities (flag state, next port state and classification society) that you are not complying with IMO tier 3 (Regulation 5 of annex VI to MARPOL 73/78) in case of SCR emergency stop with (Date, Time, and Location) details.

To perform an emergency stop, follow these steps:

1. Press the "Emergency stop switch" on the bridge.
2. The SCR system will stop, and the emergency stop screen will be displayed on the SCR panel.
3. Wait at least 10 seconds, and then turn the battery switch to (OFF) position. Perform any necessary inspections or repairs.

Service

When starting the SCR system after an emergency stop:

1. Release the emergency stop by twisting the emergency stop button.
2. The Reset button will be illuminated to show the safety stop is still active.
3. Press the Reset button on the bridge to start the system. The illumination will switch OFF to show the safety stop is no longer active

NOTICE:

Use the SCR emergency stop switch only in an emergency situation such as urea water leakage. Use of this emergency stop switch for any purpose such as on/off NOx control is prohibited.

Required service cycles

Component	Part Number	Time interval (whichever is earlier)	Task
DEF Pump filter	163500-41110	1000 hr or 1 year	Replace the DEF Pump Filter
DEF Injector	163500-42100	8000 hr or 5 years	Remove the DEF injector Install the DEF injector
DEF Pump	163500-41100	8000 hr or 5 years	Remove the DEF Pump Install the DEF Pump
NOx Sensor	163500-91100	8000 hr or 5 years	Remove the NOx sensor Install the Nox sensor

Recommended service cycles

Component	Part Number	Time interval (whichever is earlier)	Task
DEF supply hose	163500-17100	8000 hr or 5 years	Replace the DEF supply hose
Temperature Sensor	163500-91300	8000 hr or 5 years	Remove the Temperature sensor Install the Temperature sensor
BP Sensor	163500-91200	8000 hr or 5 years	Remove the Back pressure sensor Install the Back pressure sensor

Required service cycles

1. **Minor service activities:** Includes replacement of the Def Pump Filter each 1000 hr or 1 year, whichever is earlier.
2. **Major service activities:** Includes maintenance of the DEF injector, DEF pump, NOx sensors, it is also recommended to do maintenance for the DEF supply hose, the Temperature sensor, and the Back pressure sensor. Each 8000 hr or 5 years, whichever is earlier.

NOTICE:

In accordance with IMO tier 3 (Regulation 5 of annex VI to MARPOL 73/78): It is the operator/owner responsibility to keep a log of every part replacement Activity, with the date and part number, see example:

Maintenance Log Tracker

Part name	Part number	Date of change

IMO T3 solution (SCR) for YANMAR 6LY400/440

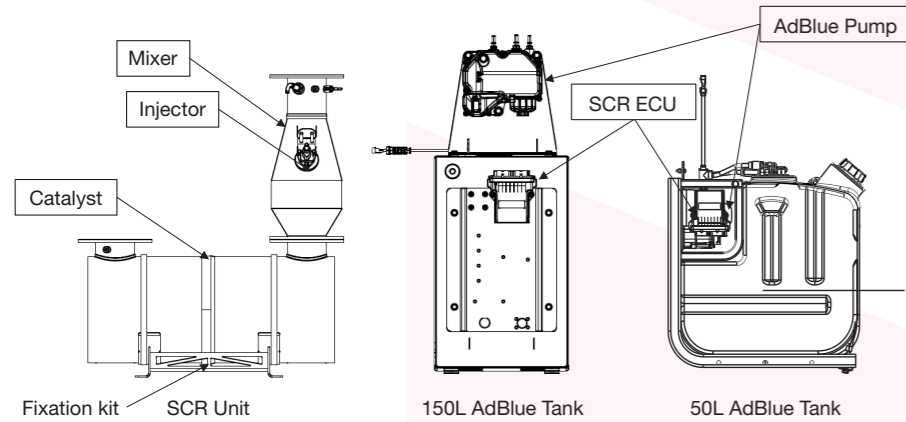
Quick reference card



Introduction

The SCR (Selective Catalytic Reduction) system is crucial for minimizing emissions and meeting IMO tier III NOx standards in marine applications. Within this system, exhaust gases are treated by adding AdBlue®/DEF before passing through the SCR reactor. A set of sensors monitors nitrogen oxide (NOx) levels in the exhaust gases. The SCR control unit calculates the ideal amount of solution to add based on engine load and speed, ensuring an effective reduction of nitrogen oxides.

System overview:



AdBlue®/DEF

NOTICE:

The quality and composition of DEF are critical factors. The utilization of low-quality DEF/AdBlue can compromise the NOx purification rate and lead to system failure. Ensure adherence to the specified DEF/AdBlue quality criteria outlined below.

DEF/AdBlue standards:

Use DEF/AdBlue which quality meets or is above the following standards. 32.5% concentration

- ISO22241 (International Organization for Standardization).
- AUS32.

Property and characteristics of DEF/AdBlue :

- DEF/AdBlue is a transparent and odorless fluid that remains non-toxic when the urea concentration is maintained at 32.5%.
- DEF/AdBlue is susceptible to freezing, with a 32.5% concentration urea water freezing at -11.5 °C.
- While DEF/AdBlue emits a minimal amount of ammonia even at room temperature, caution should be exercised, as heating can trigger hydrolysis, resulting in the release of a substantial amount of ammonia.

Caution:

- Exclusively utilize standard DEF/AdBlue; refrain from introducing any other fluids.
- Avoid blending DEF/AdBlue with any additional substances.
- Exercise caution against employing expired DEF/AdBlue, including any remnants within the tank, as it may result in DEF/AdBlue freezing, ammonia slip, reduced NOx purification efficiency, and potential damage to the system.
- When handling urea water, refrain from using gloves with fibers that may contaminate the solution. Such contamination poses a risk of clogging the AdBlue filter or causing urea deposits at the injector nozzle.

AdBlue®/DEF

Precaution:

- Urea water is susceptible to freezing, with a potential volume expansion of approximately 13%. Exercise caution to prevent device breakage when handling in low temperatures.
- In the event of AdBlue spill, promptly wipe it away and rinse with water to avoid the formation of white crystals, which may result in an unusual odor.
- Should AdBlue come into contact with vessel or easily corroded parts (such as materials like iron, copper, gunmetal, aluminum, etc.), use a cloth to wipe it off and follow up with a thorough water rinse.
- When disposing of AdBlue, dilution with a substantial amount of water allows for drainage through the sink. However, adherence to local nitrogen regulation rules is essential; if applicable, dispose of it as industrial waste.
- For comprehensive guidance on handling urea water, consult the manual provided by the AdBlue manufacturer.

Storing Urea Water:

The lifespan of AdBlue varies based on storage temperature, as illustrated in the accompanying table. It is recommended to store the AdBlue at the lowest feasible temperature. For further details, please consult the manual provided by the AdBlue manufacturer:

Storing period
based on JIS K2247-2/ISO22241-1 (32.5% concentration)

Storing temperature	Estimated urea water expiry
≤ 10 °C	36 months
10 °C < T ≤ 25 °C	18 months
25 °C < T ≤ 30 °C	12 months
30 °C < T ≤ 35 °C	6 months

At temperatures exceeding 35 °C, it is advisable to conduct regular quality checks, adhering to JIS K2247-2 standards and testing for alkalinity. It is strongly recommended to verify that the urea water extracted from storage consistently meets the standard values.

Refilling Urea Water:

Due to the injection of the AdBlue into the exhaust gas during engine operation, it is imperative to monitor its remaining quantity before each start, just like checking the fuel level. Refilling should be initiated when the caution level alarm is activated.

- Caution is warranted as urea water expands by approximately 7%-13% when frozen. To mitigate the risk of tank damage from frozen urea water, refrain from filling the tank to full capacity.
- Exercise care to avoid mistakenly filling the urea water solution into the fuel tank.
- Regularly monitor the AdBlue/DEF level in the tank, ensuring a consistent supply. If necessary, refill with the recommended AdBlue/DEF as outlined in the provided reference.
- Proactively refill AdBlue/DEF to prevent depletion during operation.
- Verify that the AdBlue/DEF is uncontaminated, free from water and dirt.

Operating

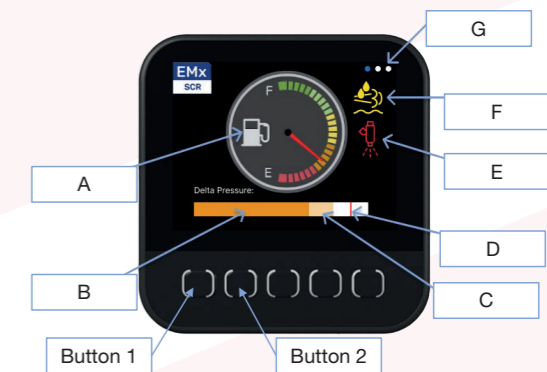
Visual Inspection of the SCR System:

Conduct a comprehensive visual inspection of the SCR system, meticulously examining the following aspects to ensure there are no defects. In the event a defect is identified, refrain from starting the engine and promptly seek guidance from your Yanmar dealer or distributor.

1. Check for water leaks within the cooling/heating circuit.
2. Inspect various components for signs of damage.
3. Examine all bolts to ensure they are securely fastened, and none are missing.
4. Inspect the AdBlue/DEF line for any potential leaks.

Switch ON main switch:

- Make sure that the SCR switch from the main panel of the vessel is on, before starting the engine.
- Start the engine, make sure that the SCR display is not displaying any alarms.



SCR Display Component description

- A. DEF tank level gauge. This widget is an analog type gauge which displays the DEF level in the tank.
- B. Pressure bar. This bar indicates the current delta pressure (darker orange color) ■.
- C. Maximum pressure. This is a component of the pressure bar which indicates the maximum pressure (lighter orange color) ■.
- D. Pressure limit. This is the last component of the pressure bar which represents the maximum pressure limit.
- E. DTC Injection MIL. This lamp is triggered by a fault on the DEF injection system.
- F. NOx MIL. This is the malfunction indication lamp which indicates:



Loss of performance in NOx conversion system.



Severe loss of NOx emissions performance, action required.

- G. Page indicator. These dots help to identify the current visualization page as well as the number of additional pages.