

## SeaStar Solutions Products i6300 Controls Operations Manual

Operating instructions for your SeaStar Solutions product.  
Please read these instructions through carefully and entirely before beginning operation.  
All specifications and features are subject to change without warning.



# Notice to Boat Manufacturer, Installer, and Consumer

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Throughout this manual, warnings are used to alert the installer/operator to special instructions concerning a particular service or operation that may be hazardous if performed incorrectly or carelessly. Observe these alerts carefully!

*These “safety alerts” alone cannot eliminate the hazards that they signal. Strict compliance to these special instructions when performing installation, operation, and maintenance plus “common sense” operation are the most effective accident prevention measures.*

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## **WARNING**

This device should not be used as a navigational aid to prevent collision, grounding, boat damage, or personal injury. When the boat is moving, water depth may change too quickly to allow time for you to react. Always operate the boat at very slow speeds if you suspect shallow water or submerged objects.

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## **WARNING**

This product contains lead, a chemical known to the State of California to cause cancer, birth defects, and other reproductive harm.

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**RECREATIONAL CRAFT DIRECTIVE 94/25/EC**

This product has been designed to be compliant with the above Directive.

Maximum performance, and compliance with the EMC Directive, can only be ensured by correct installation. It is strongly recommended that the installation conforms with the following standards:

### ***APPLICABLE STANDARDS***

- a) ISO 8846 Small Craft-Electrical Devices  
Protection against ignition of surrounding flammable gases.
- b) ISO = International Standards Organization

This device meets or exceeds the applicable ABYC, ISO, and USCG safe boating rules, regulations, standards, and guidelines.

### ***SAFE BOATING ON THE WEB***

U.S. Coast Guard      [www.uscg.mil](http://www.uscg.mil)  
U.S. Power Squadron      [www.usps.org](http://www.usps.org)

# Notice to Boat Manufacturer, Installer, and Consumer

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## *Notices*

NMEA 2000® is a registered trademark of the National Marine Electronics Association.  
Marine Canada Acquisition Inc. DBA SEASTAR SOLUTIONS.

Disassembly and repair of this electronic unit should only be performed by authorized service personnel. Any modification of the serial number or attempt to repair the original equipment or accessories by unauthorized individuals will void the warranty. Handling and/or opening this unit may result in exposure to lead, in the form of solder.

This product is covered under one or more of the following patents: 6587765, 6751533, 6965817, 7142955  
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The information contained in this manual is believed to be accurate at the time of going to print but no responsibility, direct or consequential, can be accepted for damage resulting from the use of this information. The manufacturers reserve the right to make changes, without notice, to any of its products. No part of this manual may be reproduced or transmitted in any form or by any means, electronic or mechanical, including photocopying and recording, for any purpose, without the express written permission of SeaStar Solutions.

## *Definitions*

<i>SRT (Split Range Throttle)</i>	A control feature which limits the full throttle lever position on the control to a percentage of the true engine maximum RPM's; it improves control of the boat at slow speeds. Default is 25% and may be set from 0% to 90%.
<i>Trolling Mode</i>	A transmission and control feature that allows the propeller shaft to turn at a speed below the normal idle speed.
<i>Docking Mode</i>	Describes what action the center engine or engines will take when a triple or quad engine boat is maneuvering.
<i>Sync</i>	This feature automatically sets both engines to the same RPM level. When Power Train Sync is selected, the gears and the throttles are operated by one control lever.
<i>Neutral Throttle Warmup</i>	This features allows the engine RPMs to be adjusted without the engine going into gear.

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# First Time Operation

This manual covers the most commonly used control head styles. The functionality of other style control heads is similar.

The i6300 control system requires power to the actuators, which is typically supplied by a separate breaker. However they will only become operational when they sense CAN Bus power and will then turn on and off only when the CAN Bus power is sensed. System power to the i6300 controls may operate in two ways:

- The ignition switch turns the i6300 on or off. **Note: If the CAN Bus has a separate power source the i6300 will operate even if the ignition switch is turned off.**
- A breaker or switch will turn the CAN Bus power on or off. This method is frequently used when CAN Bus power is desirable to operate the CAN Bus when the engines are not running.

Various features of the electronic control system have been selected and set as part of the installation. They can be checked in Appendix C. They include:

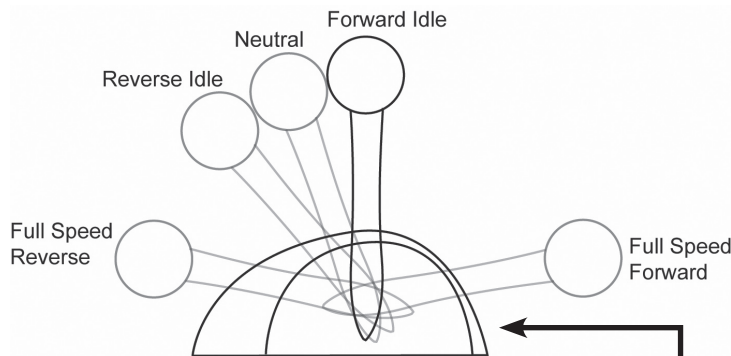
- Max Throttle Amount in Split Range Throttle (SRT)
- Shift Delays (no delay in normal operation)
- Type of Sync (Power Train or Cruise)
- Failure Modes
- Station Protection

1. Before starting the engines for the first time, take a moment to familiarize yourself with the shift and throttle controls. With the engines not running and the control system turned off, move the control levers over the full range until you are familiar with the feel. Note that the detent pressure and drag can be adjusted using the adjusting screw on the front surface of the control head. The top screw sets the detent pressure; the lower screw sets the drag. These adjustments are not available on all styles of control heads.
2. Place the control levers in neutral and turn the PORT ignition switch to the On position -- *but do not start the engine*. The green control head light will illuminate. Check to see if the green light on the control head is solid or flashing. If solid, the yellow lights will come on, proceed to Operations. If flashing, push the Select button to select the head, the yellow lights will then come on - proceed to Operations.

## Start Up

### Shift & Throttle Control Head Functions

The Shift and Throttle Control Head comes with a dual function, single lever control. A single lever control initiates both shifting and throttle for a single engine.



*Note that the detent pressure and drag can be adjusted using the adjusting screw on the front surface of some control heads.*

# Operation

## Control Head Operation

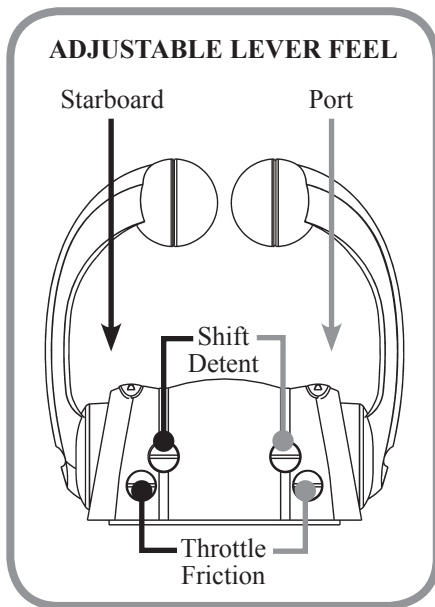
### **WARNING**

The boat will start to move during the next steps. Be very cautious when first engaging the gears to establish that forward is truly forward and reverse is truly reverse. A quick in-and-out of gear test is recommended. Ensure that the boat is clear of all obstacles forward and aft before conducting this test.

### Identification

**ENGINE TRIM CONTROL:**  
in the handle (optional)

**LEVER POSITION INDICATORS:**



**Select/change Station:**

*Note: Station Protect may be selected, see Appendix B.*

A lit **green** SELECT lamp indicates a station is active. ●

- On single station boats, station selection is automatic.
- For multi-station boats, choose a station and then press SELECT button with levers in neutral.

**TO CHANGE STATIONS:**

- Move to new station and press SELECT button. (**Green** lamp flashes.) ☀
- Match control handle positions with those of active station. (**Green** lamp goes steady when levers match and this station is now in control.) ●

**Indicator Dimming Feature:**

Push **SELECT** button and the lamps will dim. There are four degrees of brightness from which to choose.

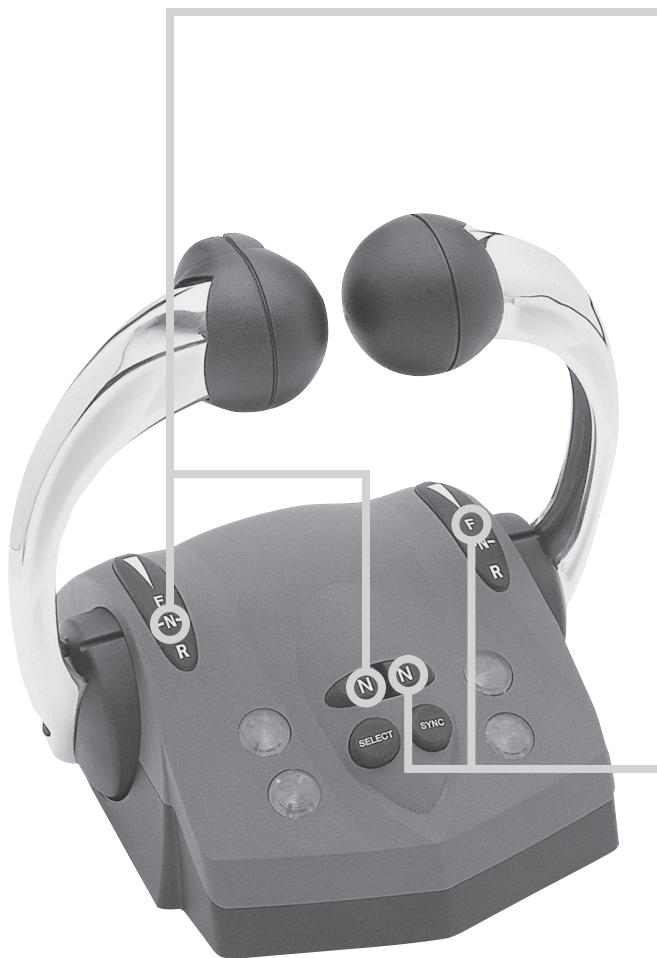
**NOTE: Indicator Dimming is only accessible from the active control station. (Green lamp on steady.)** ●

# Operation

## WARNING

The flashing yellow N (Neutral) lamp ☀ can indicate status of either NTW or SRT. Please exercise caution when engaging/disengaging either of these modes! A steady-on Neutral lamp ALWAYS indicates engine is in NEUTRAL. ●

*Note: Neutral Throttle Warmup and Split Range Throttle may NOT be engaged at the same time.*



## Neutral Throttle Warmup (NTW):

Flashing yellow N (Neutral) lamp indicates NTW engaged for this engine. ☀ Allows throttle without gear engagement for engine start/warm-up.

### TO ENGAGE NTW:

- Move engine's lever to the "Neutral" position.
- Press the N (Neutral) button next to this lever. (Yellow lamp flashes.) ☀

### TO DISENGAGE NTW:

- Return engine's lever to the "Neutral" position.
- Press N (Neutral) button next to this lever. The yellow N (Neutral) lamp will go steady - NTW is disengaged and the engine/transmission will now respond to lever commands. ●

## Split Range Throttle (SRT):

Flashing yellow N (Neutral) lamp - SRT engaged for this engine. Provides greater throttle sensitivity: moving an engine's control lever to "Full Forward" will only produce the maximum percentage of WOT (Wide Open Throttle selected at set-up - default is 25%).

### TO ENGAGE SRT:

- Move engine's lever to Forward Idle position.
- Press N (Neutral) button next to this lever. (Yellow lamp flashes.) ☀

### TO DISENGAGE SRT:

- Move engine's lever to Forward Idle or Reverse Idle.
- Press N (Neutral) button next to engine lever. The yellow N (Neutral) lamp will go out - SRT is disengaged. ○

*Note: Split Range Throttle may be disabled. See Installation Manual to activate or deactivate.*

# Operation

## WARNING

*When FULL maneuvering capabilities are required, you MUST turn Sync OFF.*

### Sync Operations:

**NOTE:** Your i6300 ships with Power Train Sync Active. You cannot enter Sync in “Reverse,” or when “Neutral Throttle Warmup” or “Split Range Throttle” is selected. Cruise Sync can be switched on with an i5600 display. See i6300 installation manual.

#### **Power Train Sync (PTS): Default**

Automatically synchronizes engines (throttle and gears); the port lever controls throttle and shift of both engines across the entire control range.

A lit **red** SYNC lamp indicates sync is engaged. ●

#### **TO ENGAGE PTS:**

- Press SYNC button. (**Red** lamp flashes.) ☀
- Match control handle positions within 5% of each other. (**Red** lamp goes steady when levers match — power trains are now in sync.) ●

#### **TO DISENGAGE PTS:**

- Press SYNC button. (**Red** lamp flashes.) ☀
- Match control handle positions within 5% of each other. (**Red** lamp goes off when levers match — power train sync is now disengaged.) ○

#### **Cruise Sync (CS):**

Automatically synchronizes engine RPMs when levers are close together and above 20% forward throttle.

A lit red SYNC lamp indicates sync is enabled. ●

#### **TO ENABLE CS:**

- Press SYNC button. (**Red** lamp flashes.) ☀
- Match control handle positions within 5% of each other. (**Red** lamp goes steady when levers match — CS is now enabled.) ●

#### **CS AUTOMATIC ENGAGEMENT:**

- When levers are moved within 10% of each other and over 20% forward throttle.

#### **CS AUTOMATIC DISENGAGEMENT:**

- When levers are moved more than 10% apart or under 20% forward throttle.

#### **TO DISABLE CS:**

- Press SYNC button. (**Red** lamp flashes.) ☀
- Match control handle positions within 5% of each other. (**Red** lamp goes off when levers match — cruise sync is now off.) ○





# Operation

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## System Alarms

### *Critical Alarms*

**Continuous flashing** lights on the control indicates a **Critical Alarm**. System will do a “Safe Shut Down.”

When a critical alarm occurs, the system will automatically go to the selected “Failure Mode.” The system **MUST** be shut down and restarted for most critical alarms. Some functions may operate for a time after restart (see Appendix A).

If the alarm is caused by the an Actuator hitting a “Stop,” the alarm will go away when the lever is pulled back. **However, as with ALL Critical Alarms, the system must be serviced as soon as possible.**

### *Non-critical Alarms*

**Intermittent flashing** of lights on the control (five seconds flash, normal for fifteen seconds, then repeating), indicates a **Non-Critical Alarm**. Acknowledge by a power up cycle. Continue to operate and **have the system checked as soon as possible.**



# Appendix A - Critical Alarm Codes and Failure Modes

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The i6300 continuously monitors many parameters and determines if it has control of the boat. In the event a problem is encountered appropriate action is automatically taken by the i6300 control system to assure safe operation.

Based on the problem encountered the i6300 control system uses the lights on the control head as follows.

- Both lights on a side off – The CAN Bus power has been lost or the control head is no longer communicating with the actuators. Assuming the actuators still have power they will put the system in the selected safe shut down mode.
- The lights on a side are flashing for five seconds and then normal for fifteen seconds and the pattern continuously repeats. This is a non-critical failure. You may continue to use the system but must have it serviced on return to port as a problem is developing.
- The lights on a side flashing continuously indicates this is a critical failure. The system will go to the selected failure mode. Return the control levers to neutral and then any components still operating can be controlled. Have the system serviced as soon as possible.

Any time the lights are flashing an alarm: if the two buttons associated with that control lever are pressed at the same time a code will flash on the lights.

Two flashes	☼ ☼	indicates the shift actuator has caused the failure.
Three flashes	☼ ☼ ☼	indicates the throttle actuator has caused the failure.
Four flashes	☼ ☼ ☼ ☼	indicates the control head has caused the failure.
Five flashes	☼ ☼ ☼ ☼ ☼	indicates miscellaneous devices on the network.

## Failure Modes

The i6300 system offers two shut down modes. The safe shut down mode is selected in the set up process. See installation manual to change safe shut down mode.

- Mode **G** (Gear) – The throttle is returned to idle and the gear remains in its current position.
- Mode **N** (Neutral) – The throttle is returned to idle and the gear goes to neutral. This is the default mode.

## Appendix B - Station Select Protection

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Station Select Protection prevents accidental switching between control stations on multi-stationed boats. If turned on, a change of control stations requires that control head buttons be pressed in a specific sequence - ***SELECT, SELECT, NEUTRAL, SELECT to change stations.***

The menu options are:

- Station Select Protection *N* (Off - Default Setting)
- Station Select Protection *Y* (On)

***See the Installation Manual (MANIN6300M02) to change settings.***

### ***Operation***

If Station Select Protection is turned on, to select or change stations use the following button sequence:

- Go to the station you wish to make active
- Press the Select button
- Press the Select button again
- Press the Neutral or 'N' button
- Press the Select button
- The station will go active (green light on solid) if the handles are matched with the originally active station.
- If the green light flashes, match the handles with the originally active station and the green light will go solid.

### **WARNING**

Until the green light is on solid, the original active station retains control of the boat.

# Appendix C - Default Settings

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## *i6300 Default Settings*

Sync – Power Train or Cruise	Power Train
Lead Engine – Port or Starboard	Port
Split Range Throttle 0-90%	25%
Forward Throttle Curves	F1
Reverse Throttle Curves	R1
Programmable Shift Delay	6.0
RPM Sense	6
Throttle / Push – Pull	Push
Throttle Stroke	50mm
Shift / Push – Pull	Pull
Fwd Shift Stroke	32mm
Rev Shift Stroke	32mm
Overshift / Off – On	Off
Station Protect	Off
Window Filters – Off, W1, W2, W3	Off
Throttle Offset	0mm
Failure Modes	N
Clear Sync Table	No

To change settings, see the Installation Manual or your dealer.

# Appendix D - Control Features

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To select or change features see i6300 installation manual or contact your dealer.

## ***Sync - Power Train or Cruise***

The i6300 offers two types of engine synchronization.

- Power train sync allows one control handle to operate all engine throttles and gears over the entire operating range. The RPMs of all engines are held at the value of the lead engine and all engine gear shifts follow the lead handle. Power Train Sync is the default selection and may only be changed with an i5600 display. The feature is turned on or off using the sync button on the control head of multi-engine systems.
- ***Cruise Sync*** automatically engages when the feature is made active using the sync button on the control head and the following two conditions are achieved.

To ***enable*** Cruise Sync - the handles must be within 5% of each other and the SYNC button must be pushed.

To ***engage*** Cruise Sync - the throttles must be above 20% in forward gear and the handles are within 10% of each other.

If either condition is no longer present each engine follows its OWN control handle.

## ***Lead Engine - Port or Starboard***

This sets which engine (handle) is the lead and used to operate the system when power train sync is operating. The default is Port and may only be changed with an i5600 display.

## ***Split Range Throttle***

This feature increases the amount of throttle lever movement for a give change in throttle. It also limits the maximum amount of throttle that can be selected. The feature makes it easier to select an exact speed and limits the amount of power that can be applied. This is handy in trolling and docking situations. The maximum amount of throttle that can be achieved is settable with an i5600 display from 0 to 90% of Wide Open Throttle (WOT) in 5 percent steps. At 25% the throttle handle moves four times the usual amount for a given amount of throttle change. The default setting is 25%. A setting of 0% will turn off this feature.

## ***Forward Throttle Curves***

This allows the engine to throttle in a manner different from the motion of the throttle handle movement. This is sometimes a useful tool as not all boats and engines respond in a similar manner. The F1 curve is the default and operates like a traditional mechanical control. With an i5600 any of the available curves may be selected. See installation manual MANIN6300M02 for details.

## ***Reverse Throttle Curves***

This allows the engine to throttle in a manner different from the motion of the throttle handle movement. This is sometimes a useful tool as not all boats and engines respond in a similar manner. The R1 curve is the default. With an i5600 any of the available curves may be selected. See installation manual MANIN6300M02 for details.

# Appendix D - Control Features

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## ***Programmable Shift Delay***

This is a safety feature to help control the boat in an emergency stop condition. ***This is a smart delay and causes no shift delay in normal operation.*** Example, if the throttle is immediately moved from full forward to full reverse the throttle will immediately go to idle and the transmission to neutral. Assuming the boat has been at full throttle for a good while the delay will then occur before going to full reverse. This smooth's out the deceleration to reduce the chance of injury to those aboard and allows the transmission to shift and still work after the event so the boat is not left without power. The default delay times is 6.0 seconds and may be set from 0 to 12 seconds with an i5600 display. Once again, since this is a smart delay and removes itself in normal operation, no delay is noticed in the day-to-day operation of the system. For a complete explanation of the Programmable Shift Delay see the i6300 technical manual.

## ***RPM Sense***

Adjusts the tachometer input to the type of engine that is being used. The default is a 6 pole tachometer signal. It is used by many outboards. Unless set manually the i6300 system will automatically set the correct number of poles in the first 15 minutes of operation.

## ***Throttle Push / Pull***

Sets the throttle to push for throttle or pull for throttle. The default is push for throttle which covers the majority of outboards.

## ***Throttle Stroke***

Adjusts the length of the throttle stroke. The default is 50 mm. See the installation manual.

## ***Shift Push / Pull***

Sets which direction the shift will move for forward gear. The default is pull for forward which is common for many outboards. See the installation manual.

## ***Forward Shift Stroke***

Sets the shift stroke distance in the forward direction. The default is 32 mm. See the installation manual.

## ***Reverse Shift Stroke***

Sets the shift stroke distance in the reverse direction. The default is 32 mm. Requiring a different shift stroke setting in the forward and reverse direction is common.

## ***Overshift - On / Off***

When the shift lever is returned to neutral, on some outboards, the gears may hesitate to drop out and return to neutral. With mechanical controls the operator would “jiggle” the shift handle to get into neutral. When turned on, this feature automatically jiggles the shifter to get to neutral. This is accomplished by the shift actuator going a little past the neutral point and then pulling back to the neutral setting. This artificial jiggle places the gear into neutral. The default is off as most engines do not require this feature.

## ***Station Protect***

Restricts station transfer unless a code is inserted into the station requesting to take over command of the boat. The primary use of this feature is to protect against small children on the boat from accidentally taking control at an unmanned station. See Appendix B for details. The default is Off.

# Appendix D - Control Features

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## ***Window Filters***

On some engines the tachometer signal is quite erratic. The Window Filter is used to smooth the tachometer output from the control system. The four settings are as follows. The default is no filter.

***Off*** No filter (default)

***W1*** 50 RPM Works if tach is jumping outside a + or - 25 RPM range.

***W2*** 100 RPM Works if tach is jumping outside a + or - 50 RPM range.

***W3*** 150 RPM Works if tach is jumping outside a + or - 75 RPM range.

## ***Throttle Offset***

Allows electronic adjustment of the throttle idle position so the throttle handles can be aligned without repetitive mechanical adjustments. On multi-engine boats it is desirable to have both throttle handles start to advance the throttles at the same time. This can be difficult to set on some outboards. This feature lets you electronically set the point where the throttle starts. The default is Off and an i5600 is required to use this feature. For additional information see the i5600 manual.

## ***Clear Sync Table***

A service feature that allows the sync table to be cleared on the ***active*** control head (each control head has it's own Sync Table and needs to be cleared individually). Select the item and press the SEL button to clear the table. For complete information on the sync table see the i6300 technical manual.

## ***Failure Modes***

This determines what action the system will try to take should a critical failure occur:

- ***N*** (Neutral) - places the shift in neutral and throttle to idle over a 3 second period. This is the default mode.
- ***G*** (Gear) - leaves the shift in it's pre-failure position and moves the throttle to idle over a 3 second period.

## Appendix E - Actuator Spare Parts Kits

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*Notice: Actuator spare parts only supplied with the kit and are not sold separately.*

### ***Actuator Spare Parts Kit - Part No. 9859711***

includes the following:

<b>QTY</b>	<b>Part No.</b>	<b>Description</b>
1	ND0701-24	Rod Clamp
1	ND0701-25	Cable end (10-32 thread)
1	NM0102-20	Cable end (M5 thread)
1	21059M3030162	Screw, M5 x 30 mm CR Pan Hd
1	21059M1212162	Screw, M5 x 12 mm CR Pan Hd
1	NM0101-26	Cable grommet

### ***Actuator Spare Parts Kit - Part No. NM0801-00***

replaces RED “Auto Manual” handle of the actuator (enough parts for 2 actuators)

and includes the following:

<b>QTY</b>	<b>Description</b>
2	Levers
2	Pins
2	C-Spring Clips
4	Wavy washers



# Installation Notes

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# Installation Notes

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