

## **KC102 Series Engine Control System**

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Description of H102 series control head keypad  
Error code on control head
- Chapter 1 – Description of H102/ H102A Control Head
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Error code for actuator
- Chapter 3 – Single line cabling & Wire Termination
- Chapter 4 – Power Up & Initial Checks.  
Actuator & Control heads error code
- Chapter 5 – Installing the 43C Push Pull Cable
- Chapter 6 – Throttle Module & Clutch Module Stroke Adjustment
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# **KC102 Series Engine Control System**

## Chapter 0

### Operation of

KC102 / KC102E

Engine  
Control System

A large, stylized orange logo consisting of a circle with a horizontal line through it, forming a shape similar to a stylized 'S' or a wave. The letters 'ITS' are written in a bold, orange, sans-serif font across the middle of the logo.

## Operating the KC102 / KC102E Control System

- 1) Upon power up,  
Station 1 buzzer will sound  
Station select light will be flashing  
Station Lock light is steady.
- 2) Control handle **MUST** be place in Neutral position  
Press Station Select to acknowledge and silence the buzzer

### **CAUTION!**

**The Control system is now operational.  
Operate with care by trained personnel only.**

- 3) Station 1 is now in command.  
As Station Lock is still lighted, control is locked at station 1.  
To transfer station, press Station Lock.  
(This will unlock the lock function)  
Station Lock light will be deactivated and station transfer is now possible.
- 4) Go to the station that you want control  
Control handle **MUST** be place in Neutral position.  
Press the Station Select button.  
With a beep sound the station control is now transfer to the new station.  
Operator can choose to Station Lock the control system.

# Control Head H102 / H102A Keypad

## Description of the keypad operation

### 1) Station Select

This button is for selecting the control station to be in command.

Power up default: Station 1

Station Lock **MUST** be deactivated & control handles **MUST** be place in neutral before station control can be transfer

### 2) Station Lock

This feature will lock the station in command and will not allow Transfer of control to any other station

Power up default: Station 1

Press to deactivated, no light, and press again to activate, lighted.

### 3) Port Override

This feature will allow the port handle control of throttle **WITHOUT** activating the gear box.

Control handle **MUST** be place in neutral.

Press the button and the light is on.

Move the port handle into the clutch detent, gear box should not activate.

Moving the lever further will start to increase the engine rpm.

Move control lever back to neutral and press button, light off.

### 4) Stbd Override

This feature will allow the starboard handle control of throttle **WITHOUT** activating the gear box.

Control handle **MUST** be place in neutral.

Press the button and the light is on.

Move the port handle into the clutch detent, gear box, should not activate.

Moving the lever further will start to increase the engine rpm.

Move control lever back to neutral and press button, light off.

### 5) Sync Mode

This allows control of a twin engine with one control handle.

Power up default: Starboard Handle

### 6) Dim

This allows the dimming of the LED lights on the keypad.

Power up default: Full brightness

Press, press, press, press, press to get the required brightness.

## A102 Actuator error code display

### On A102 Actuator

Error cause	Buzzer	Buzzer Pulse	On Display
Communication	“1”	— •	ERR 1
Memory	“2”	— ••	ERR 2
Sensor	“3”	— •••	ERR 3
Temperature	“4”	— ••••	ERR 4
Clutch Motor	“5”	— •••••	ERR 5
Throttle Motor	“6”	— ••••••	ERR 6

### On H102/H102A Control Head

\*A1=PORT  
\*A2=STBD

Error cause	Buzzer	Buzzer Pulse	On Display
Communication	“1”	— •	A1ER1 / A2ER1
Memory	“2”	— ••	A1ER2 / A2ER2
Sensor	“3”	— •••	A1ER3 / A2ER3
Temperature	“4”	— ••••	A1ER4 / A2ER4
Clutch Motor	“5”	— •••••	A1ER5 / A2ER5
Throttle Motor	“6”	— ••••••	A1ER6 / A2ER6

## H102/H102A Control Head error code display

### On A102 Actuator

\*H1=Station 1

\*H2=Station 2

\*H3=Station 3

\*H4=Station 4

Error cause	Buzzer	Buzzer Pulse	On Display
Communication	“1”	— •	H1ER1 / H2ER1 / H3ER1 / H4ER1
Memory	“2”	— • •	H1ER2 / H2ER2 / H3ER2 / H4ER2
Sensor	“3”	— • • •	H1ER3 / H2ER3 / H3ER3 / H4ER3
Temperature	“4”	— • • • •	H1ER4 / H2ER4 / H3ER4 / H4ER4

### On H102/H102A Control Head

\*H1=Station 1

\*H2=Station 2

\*H3=Station 3

\*H4=Station 4

Error cause	Buzzer	Buzzer Pulse	On Display
Communication	“1”	— •	H1ER1 / H2ER1 / H3ER1 / H4ER1
Memory	“2”	— • •	H1ER2 / H2ER2 / H3ER2 / H4ER2
Sensor	“3”	— • • •	H1ER3 / H2ER3 / H3ER3 / H4ER3
Temperature	“4”	— • • • •	H1ER4 / H2ER4 / H3ER4 / H4ER4

# **KC102 Series Engine Control System**

## Chapter 1

### H102 / H102A

CONTROL HEAD



## 1. H102 / H102A Control Head

### 1.1 SW2, to the correct position

0 – Station 1

1 – Station 2

2 – Station 3

3 – Station 4

### 1.2 F\_Switch, S5, Setting

Switch	ON	OFF	Default
1	H102	H102A	ON
2	Dual Lever	Single Lever	ON
3	External Buzzer	External Buzzer	ON
4	Internal Memory	External Memory	OFF
5	Calibration & Test Enable	Calibration & Test Disable	OFF

### 1.3 For the last control station, Set SW3 to “ON”



## H102 Series Control Head



H102 – Forward Console  
H102A – AFT Console

## **Control Head H102 / H102A Keypad**

### **1) Station Select**

This button is for setting the control station to be in command.

Power up default: Station 1

Station Lock **MUST** be deactivated & control handles **MUST** be place

In neutral before station control can be transfer

### **2) Station Lock**

This feature will lock the station in command and will not allow transfer of control to any other station.

Power up default: Station 1

Press to deactivated, no light, and press again to activate, lighted.

### **3) Port Override**

This feature will allow the port handle control of throttle **WITHOUT** activating the gear box.

Control handle **MUST** be place in neutral.

Press the button and the light is on.

Move the pot handle into the clutch detent, gear box should not activate.

Moving the leer further will start to increase the engine rpm.

Move control lever back to neutral and press button, light off.

“This feature is usefully for operating PTO off the engine”

### **4) Stbd Override**

This feature will allow the starboard handle control of throttle **WITHOUT** Activating the gear box.

Control handle **MUST** be place in neutral.

Press the button and the light is on.

Move the port handle into the clutch detent, gear box should not activate.

Moving the lever further will start to increase the engine rpm.

Move control lever back to neutral and press button, light off.

### **5) Sync Mode**

This allows control of a twin engine with one control handle.

Power up default: Starboard Handle.

### **6) Dim**

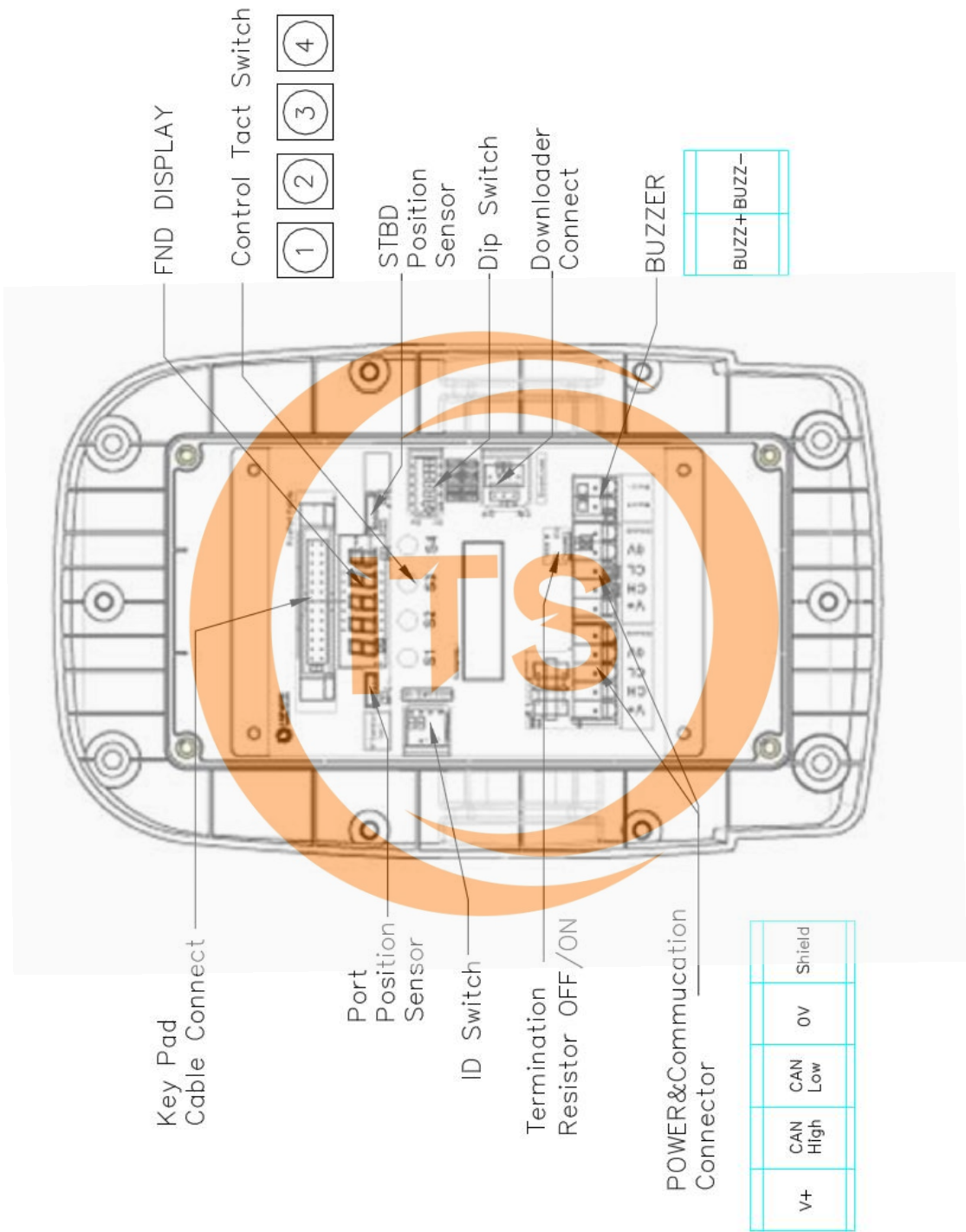
This allows the dimming of the LED lights on the keypad.

Power up default: Full brightness

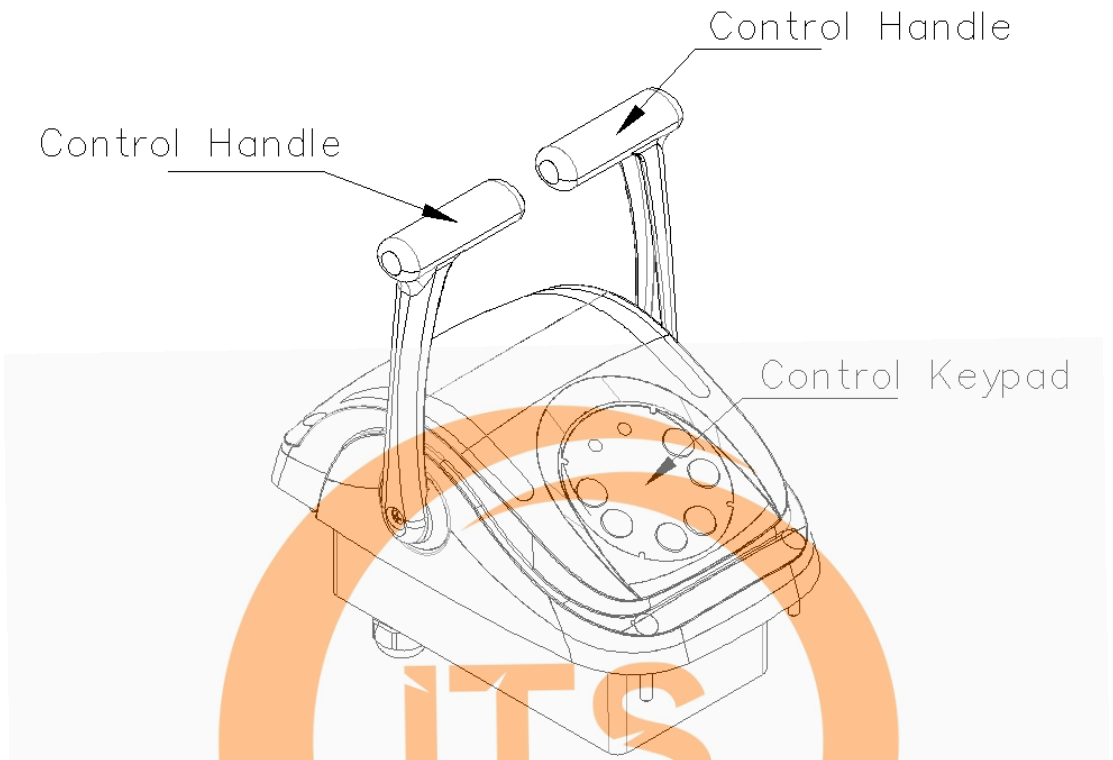
Press, press, press, press, press to get the required brightness.

H102 Series Control Head

Main board on Control Head

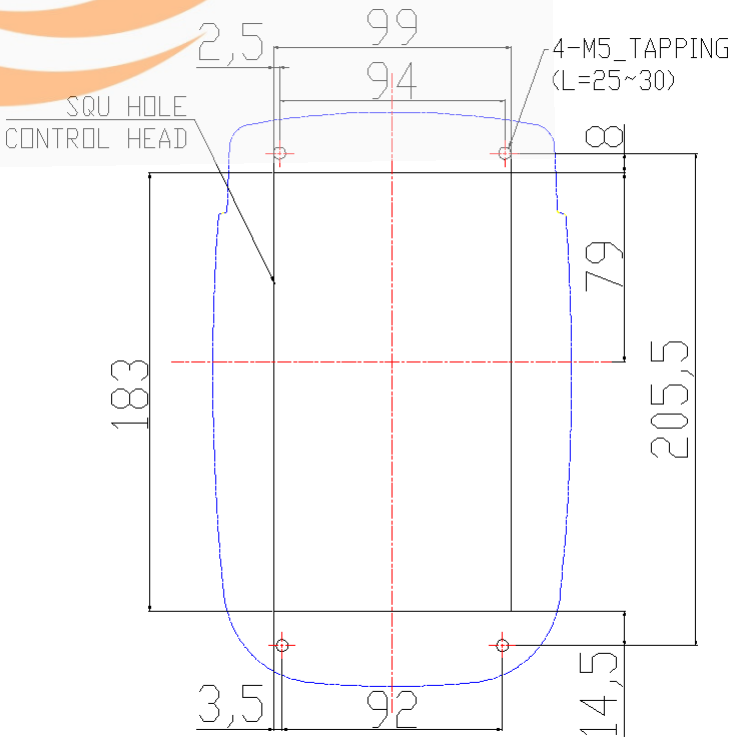
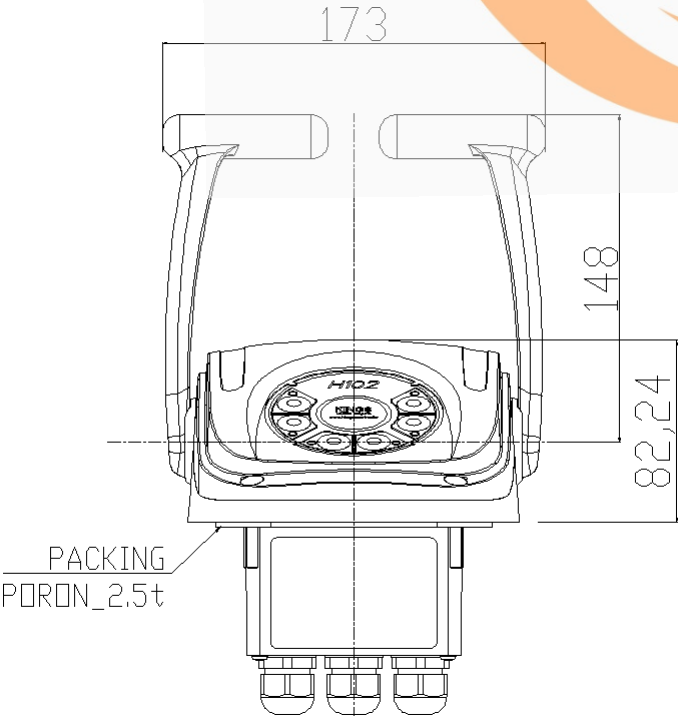


H102 Series Control Head



H102 Series Dimension

Mounting Hole Dimension



# **KC102 Series Engine Control System**

## Chapter 2

### A102

ACTUATOR UNIT



## A102 ACTUATOR UNIT





## 2.A102 Actuator Unit

- 2.1 The A102 actuator is made up of three module,  
They are Throttle module, ECU module & Clutch module.
- 2.2 The throttle module contain the drive mechanism for the operation of the 43C push pull cable, the limit sensor and the feedback sensor
- 2.3 The clutch similar to the throttle module also contains the drive mechanism for the operation of the 43C push pull cable, the limit sensor and feedback sensor.
- 2.4 The ECU contains the software and the electronics for the control of the throttle & clutch module. All input and output wires connections are terminated here.

### **!! CAUTION**

**DO NOT INSTALL THE 43C PUSH PULL CABLE**

- 2.5 Setting the dip switches.

Switch	ON	OFF	Default
1	STBD	PORT	OFF
2	Throttle Reverse	Throttle Normal	OFF
3	Clutch Reverse	Clutch Normal	OFF
4	SYNC STBD	SYNC PORT	OFF
5	Internal Memory	External Memory	OFF
6	Calibration & Test Enable	Calibration & Test Disable	OFF

## A 102 Actuator error code display

ON FND	Error cause	Buzzer	Treatment
ERR 1	Communication	“1”	Check CAN BUS connector wiring Check motor broken
ERR 2	Memory	“2”	Check Dip switch & Function set up Check Calibration data
ERR 3	Sensor	“3”	Check sensor connector wiring Check sensor broken
ERR 4	Temperature	“4”	Check temperature of main board
ERR 5	Motor	“5”	Check motor connector wiring
ERR 6		“6”	Check motor broken

### A102 Actuator error display

#### On A102 Actuator

Error cause	Buzzer	Buzzer Pulse	On Display
Communication	“1”	— •	ERR 1
Memory	“2”	— ••	ERR 2
Sensor	“3”	— •••	ERR 3
Temperature	“4”	— ••••	ERR 4
Clutch Motor	“5”	— •••••	ERR 5
Throttle Motor	“6”	— ••••••	ERR 6

#### On H102/ H102A Control Head

\*A1=PORT

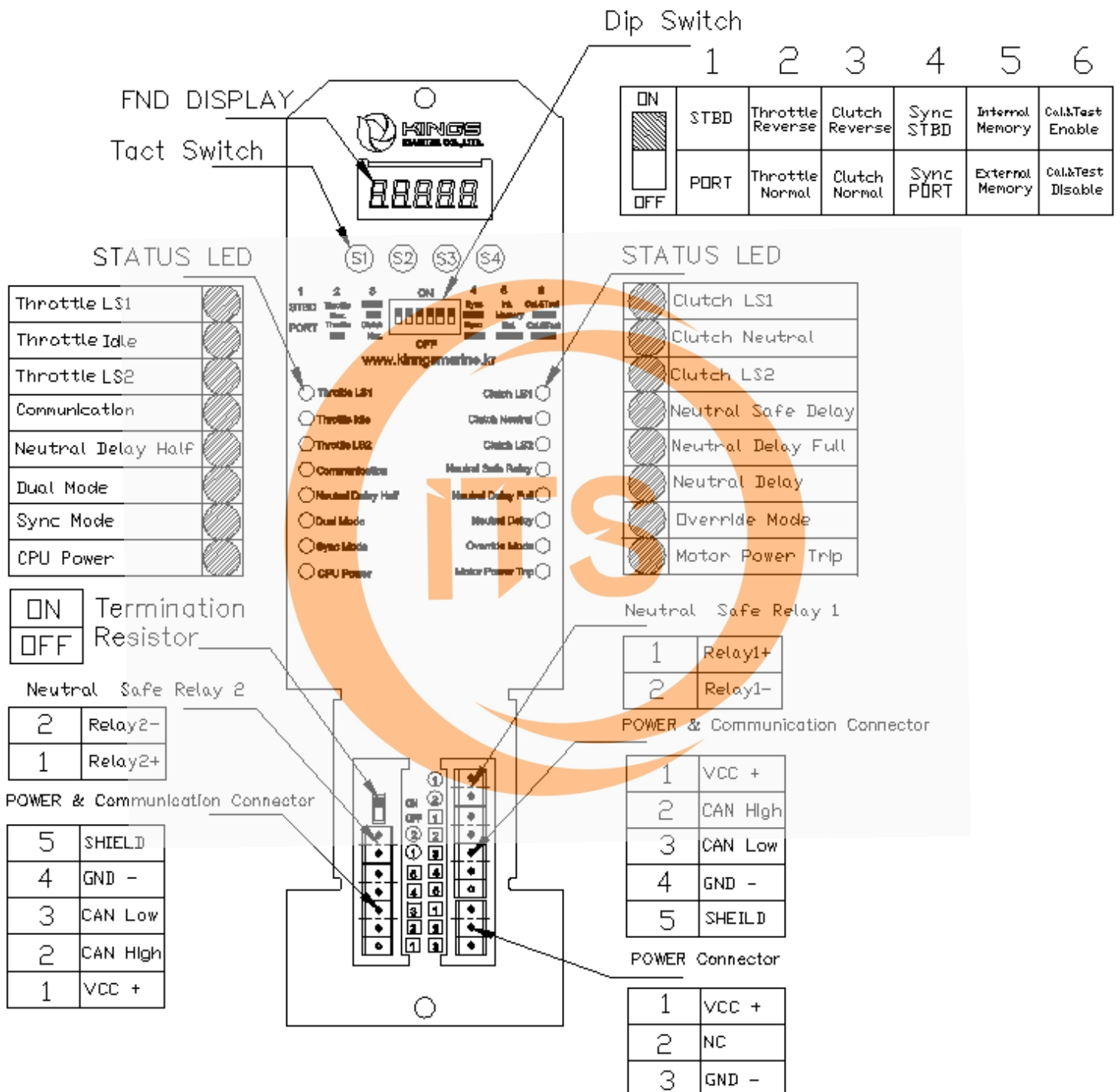
\*A2=STBD

Error cause	Buzzer	Buzzer Pulse	On Display
Communication	“1”	— •	A1ER1 / A2ER1
Memory	“2”	— ••	A1ER2 / A2ER2
Sensor	“3”	— •••	A1ER3 / A2ER3
Temperature	“4”	— ••••	A1ER4 / A2ER4
Clutch Motor	“5”	— •••••	A1ER5 / A2ER5
Throttle Motor	“6”	— ••••••	A1ER6 / A2ER6



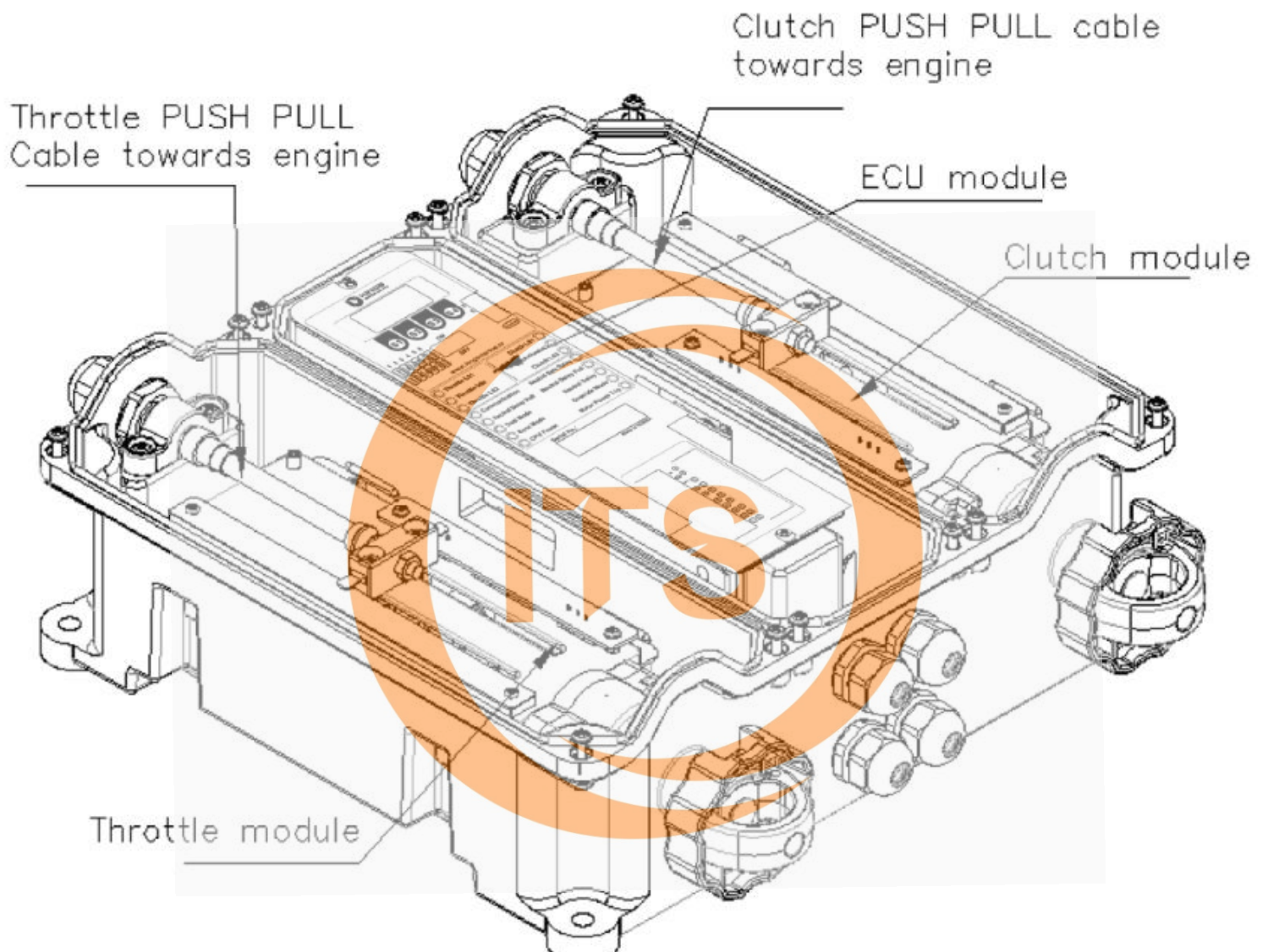
# A 102 Actuator unit

## ECU Module



## A 102 Actuator unit

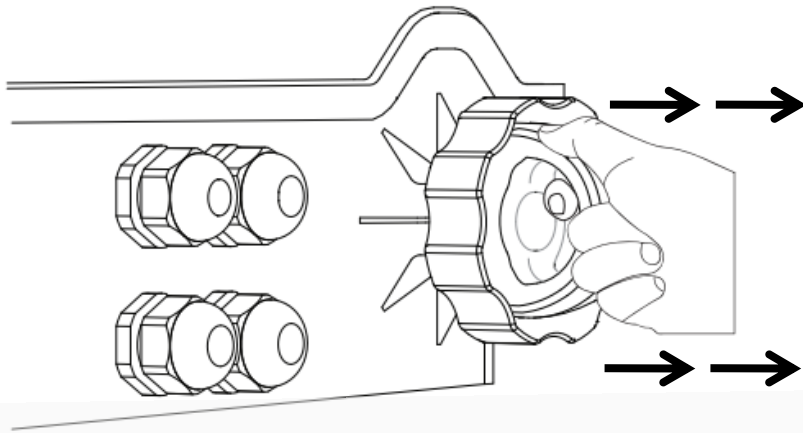
### ACTUATOR PARTS



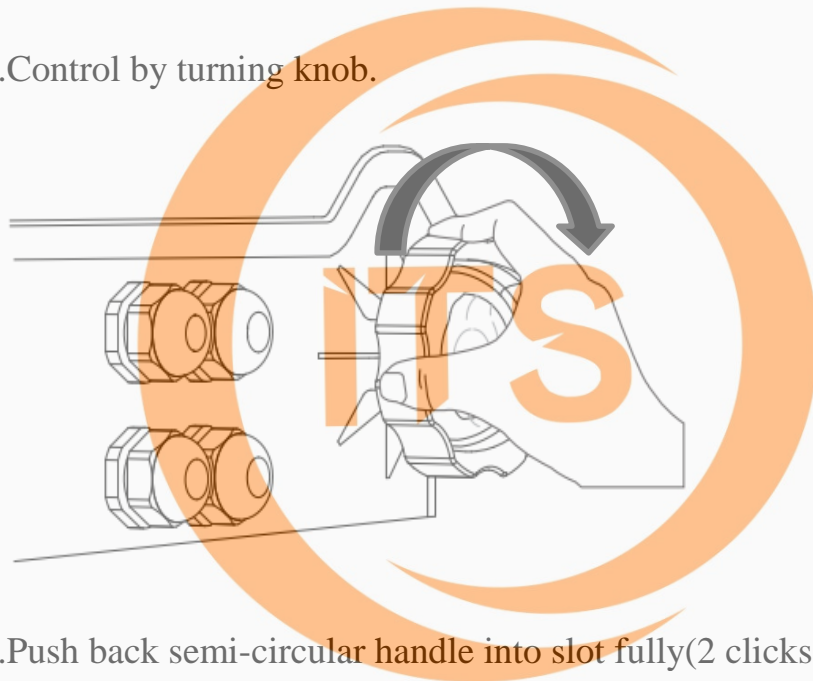
## A 102 Actuator unit

### Emergency override operation

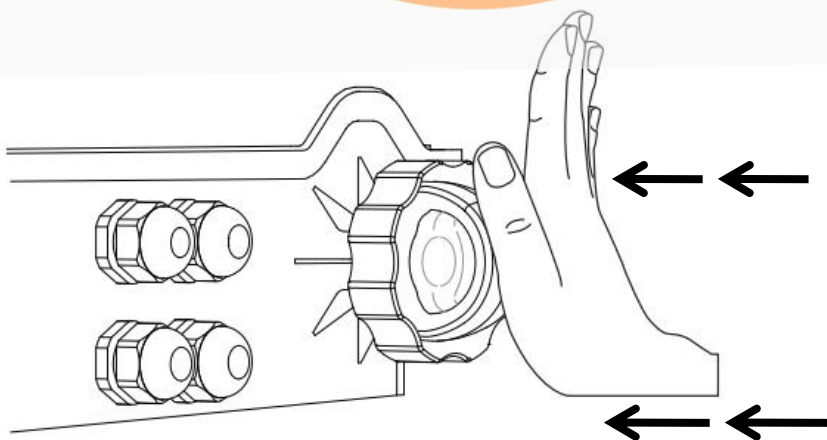
1.Pull down semi-circular handle fully.



2.Control by turning knob.



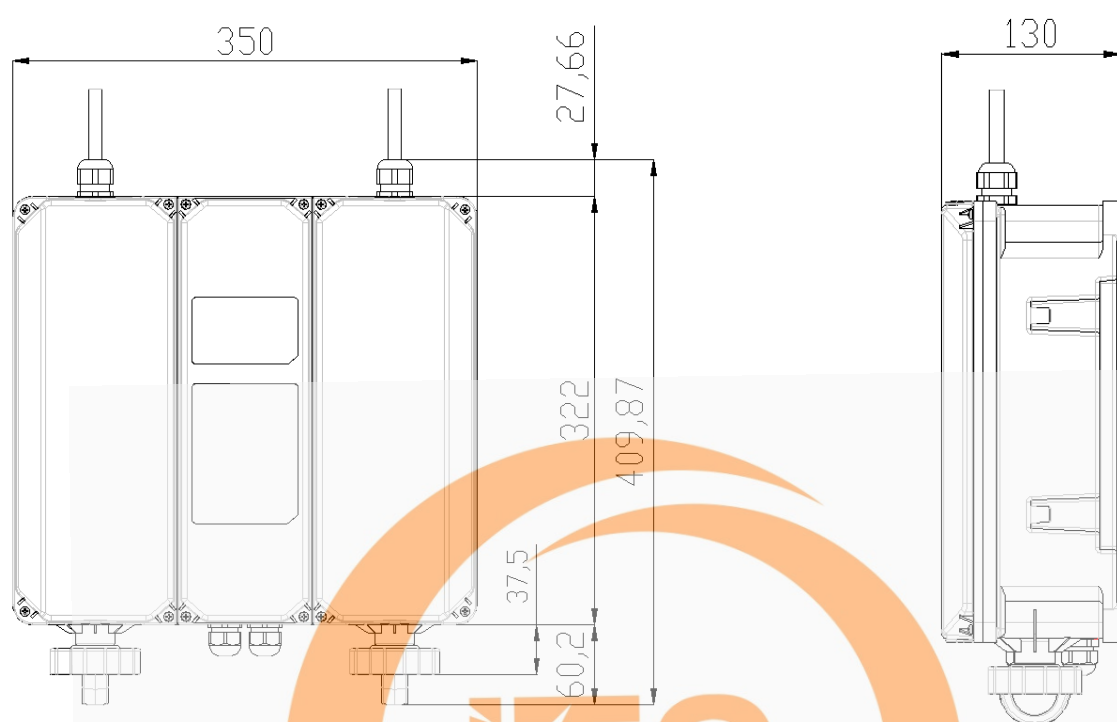
3.Push back semi-circular handle into slot fully(2 clicks)



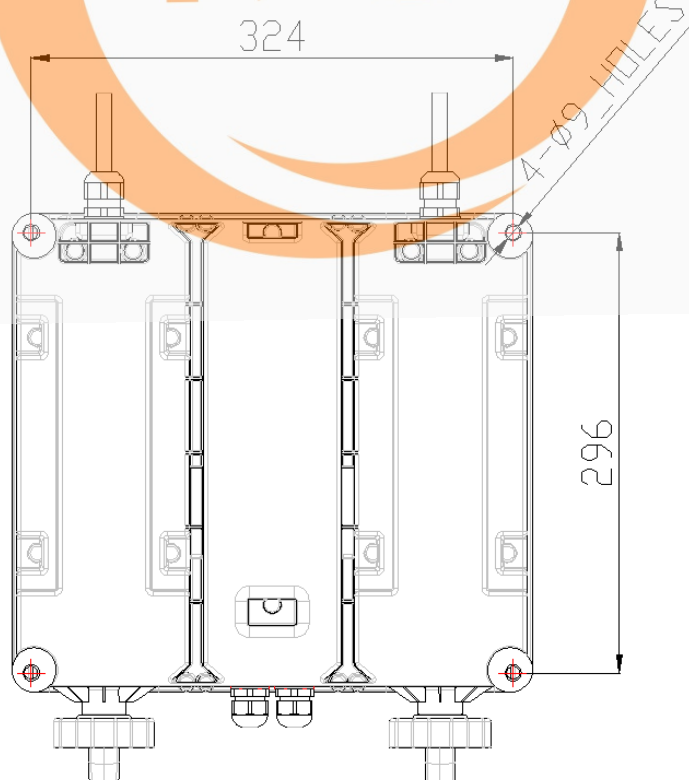
4.Reset power supply.

Mount on the panel

A102 ACTUATOR Dimension



Mounting Holes Dimension



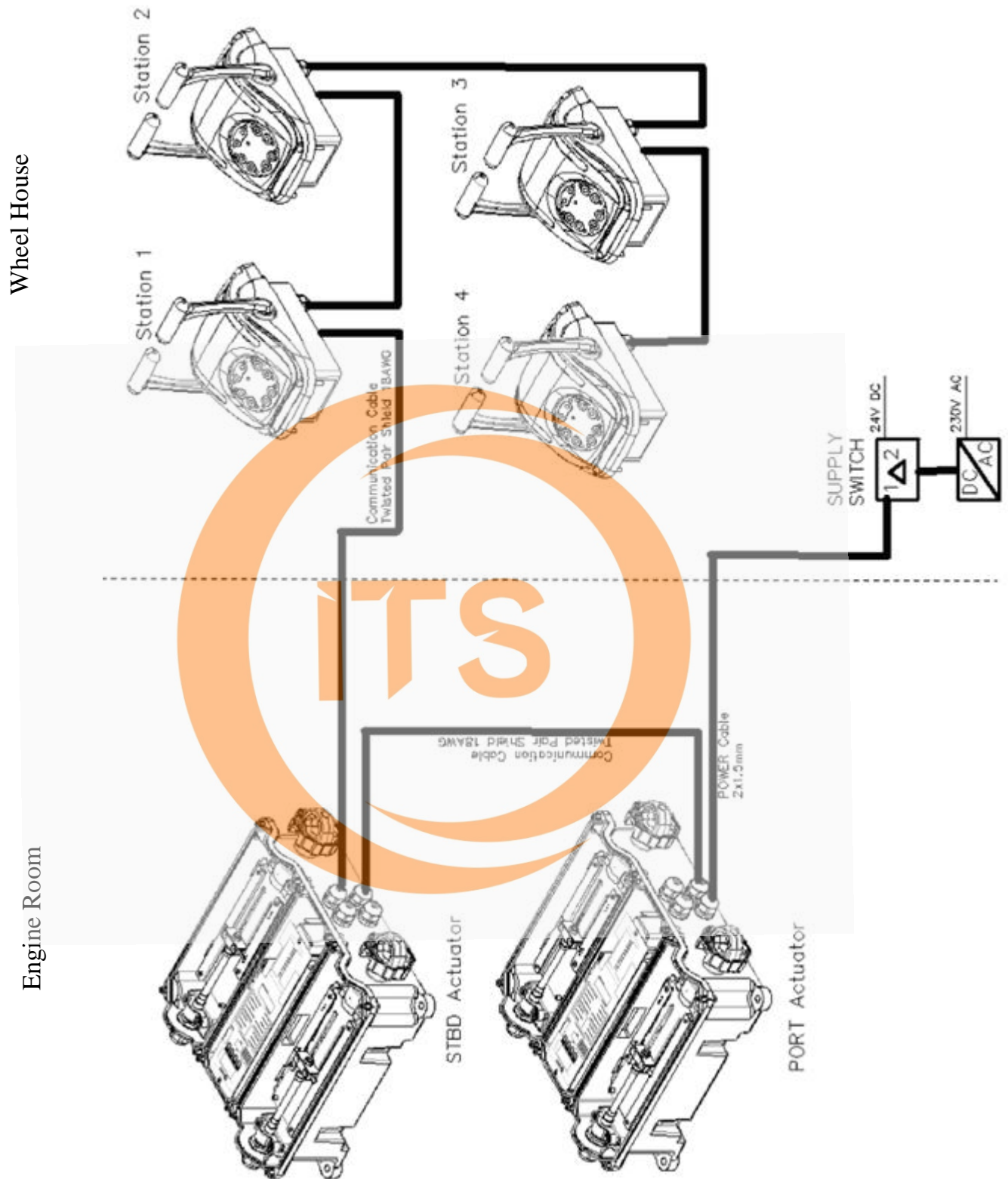
# **KC102 Series Engine Control System**

## Chapter 3

# SINGLE LINE CABLING

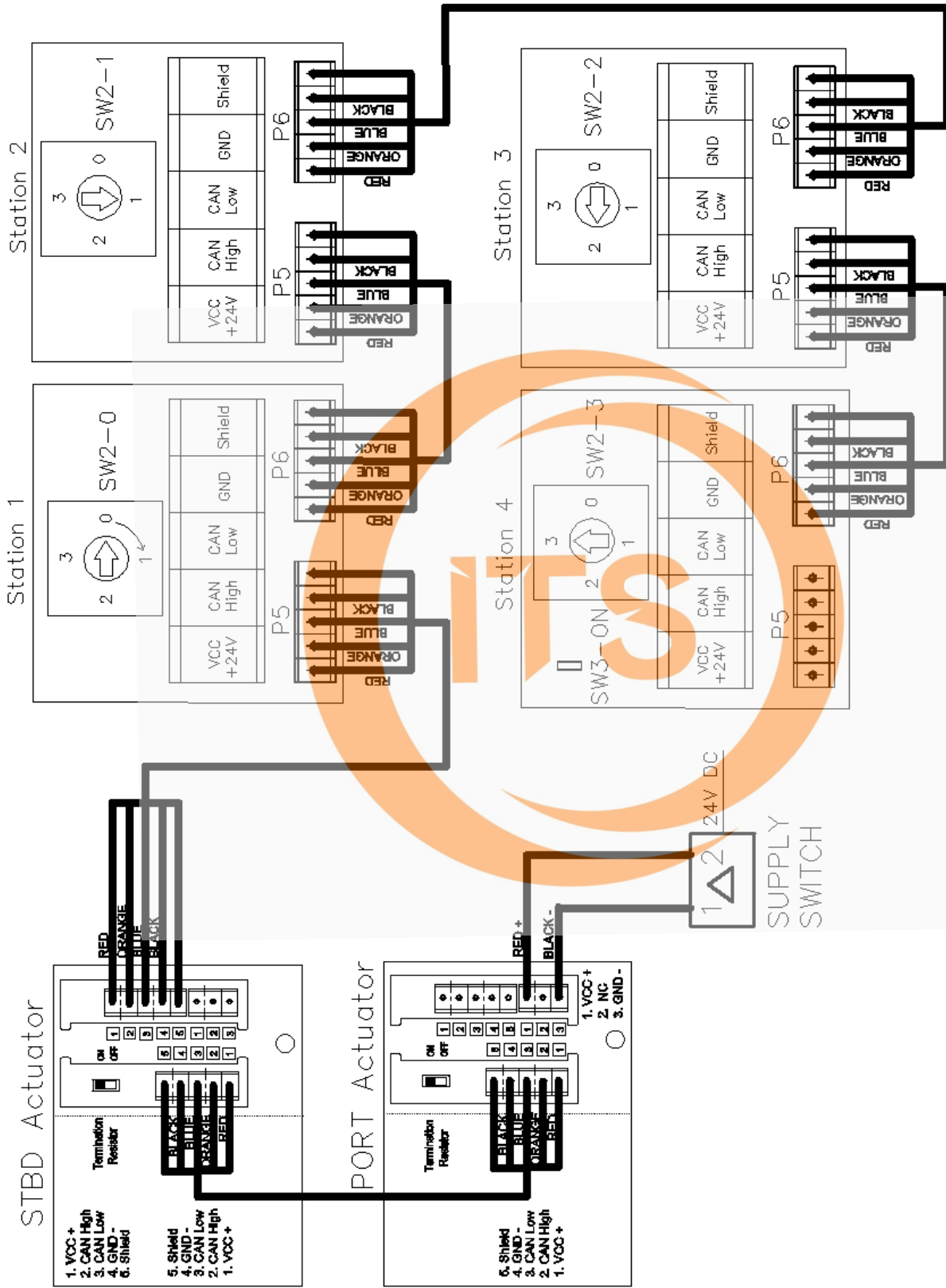


# Cabling





# Wire Termination

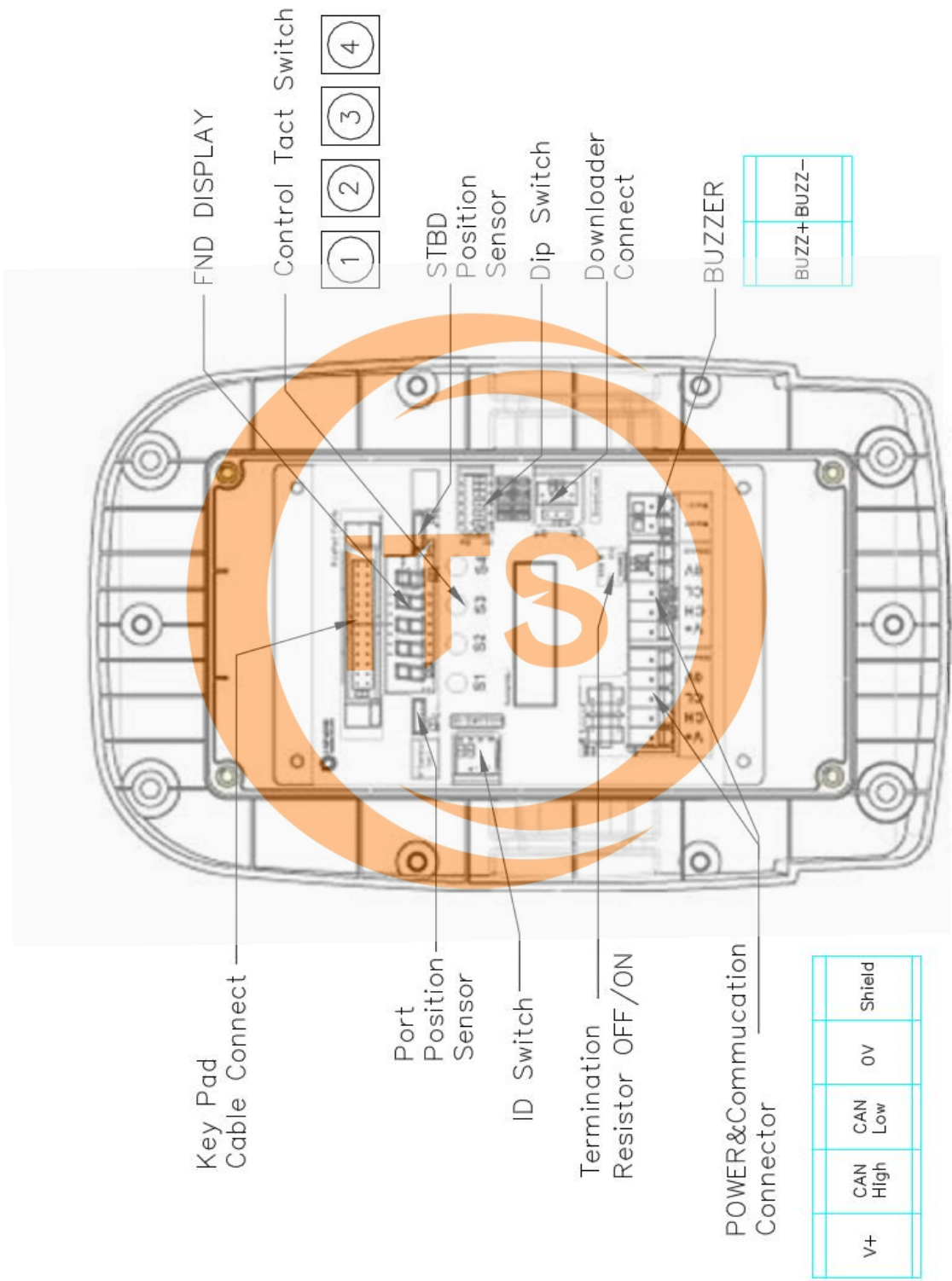


Set SW3 switch to “ON” position for last station Control Head  
 Example) If station “2” is last Control Head, set SW3 switch to “ON” position.

Install terminal link at terminal R “ON” position for last station Actuator  
 Example) If PORT Actuator is last Actuator install a terminal link at terminal R “ON” position.

Cabling & Wire Termination

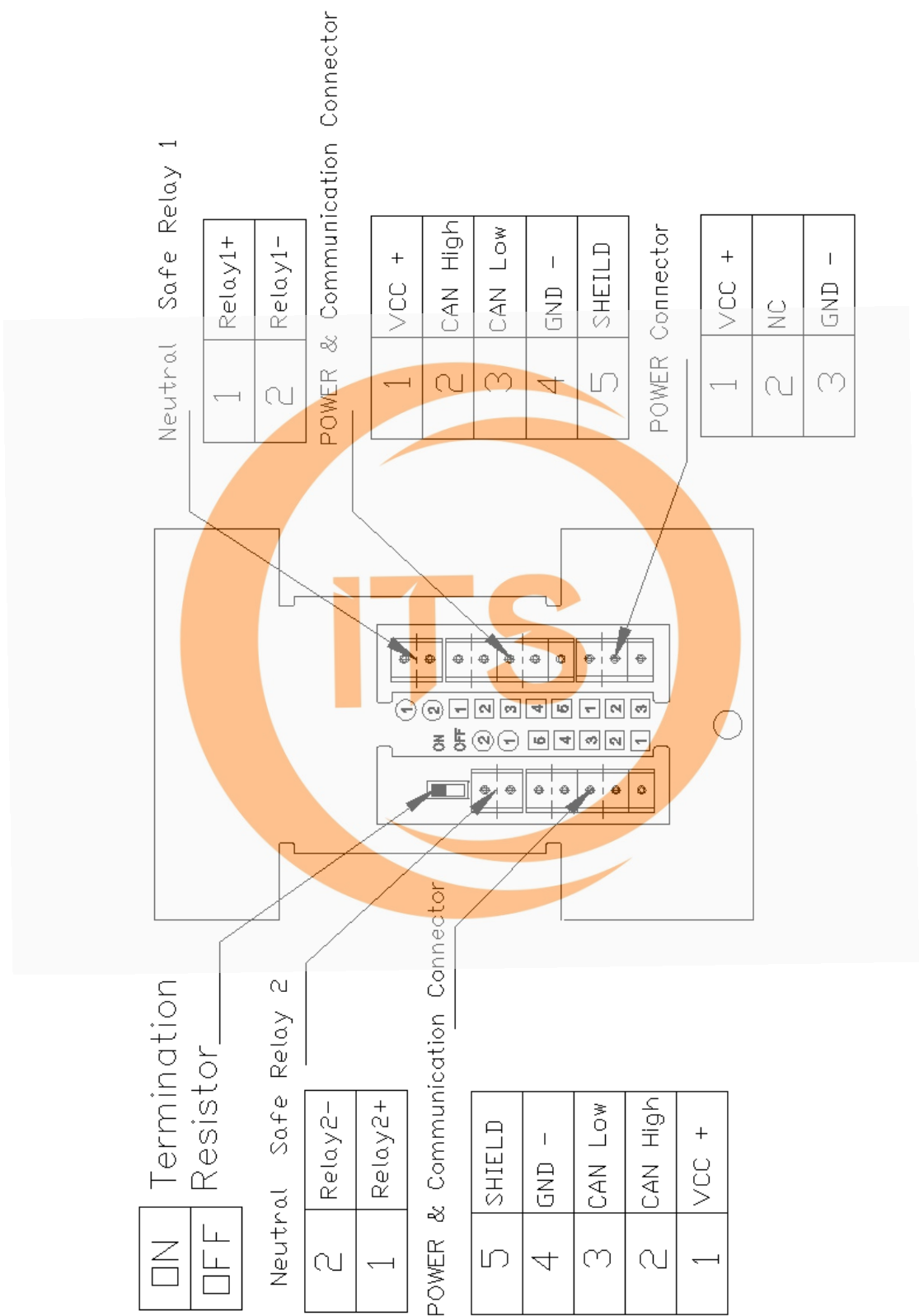
Main board on Control Head





Cabling & Wire Termination

ECU Module



# **KC102 Series Engine Control System**

## Chapter 4

# POWER UP SYSTEM

&

INITIAL CHECKS

ITS

#### 4.Power up system and Initial checks

1.1 Upon Power up, Station 1 control head will

- a) Beep
- b) Station Select light flashing
- c) Station Lock light steady

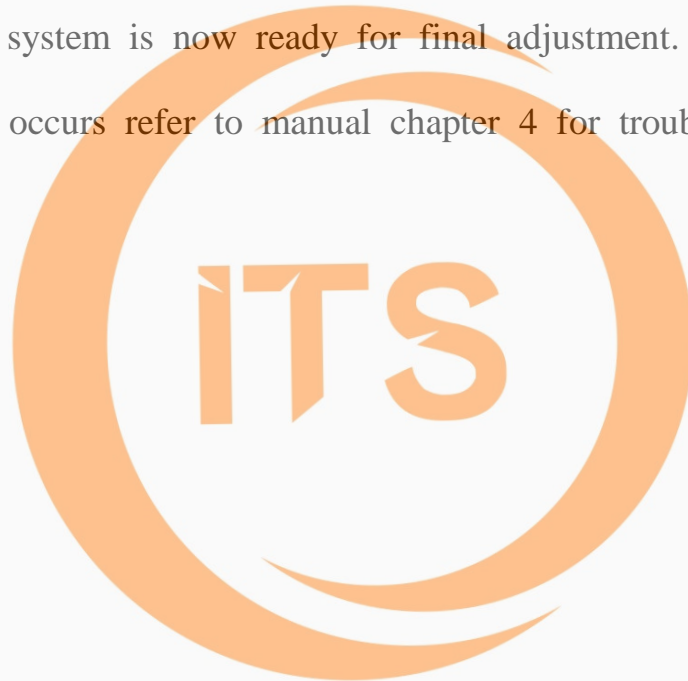
1.2 Press Station select button on Station 1

- a) Beeping stop
- b) Station Select light steady
- c) Station Lock light steady

1.3 Check that the actuator unit is displaying the correct  
Port / Stbd unit

1.4 Control system is now ready for final adjustment.

1.5 If error occurs refer to manual chapter 4 for trouble shooting.



## A102 Actuator Error Code

On Display	Error cause	Buzzer	Treatment
ERR 1	Communication	“1”	Check CAN BUS connector wiring Check motor broken
ERR 2	Memory	“2”	Check Dip switch & Function set up Check Calibration data
ERR 3	Sensor	“3”	Check sensor connector wiring Check sensor broken
ERR 4	Temperature	“4”	Check temperature of main board
ERR 5	Motor	“5”	Check motor connector wiring
ERR 6		“6”	Check motor broken

### A102 Actuator error code display on A102 Actuator

Error cause	Buzzer	Buzzer Pulse	On Display
Communication	“1”	— •	ERR 1
Memory	“2”	— ••	ERR 2
Sensor	“3”	— •••	ERR 3
Temperature	“4”	— ••••	ERR 4
Clutch Motor	“5”	— •••••	ERR 5
Throttle Motor	“6”	— ••••••	ERR 6

### A102 Actuator error code display on H102/H102A Control Head

\*A1=PORT

\*A2=STBD

Error cause	Buzzer	Buzzer Pulse	On Display
Communication	“1”	— •	A1ER1 / A2ER1
Memory	“2”	— ••	A1ER2 / A2ER2
Sensor	“3”	— •••	A1ER3 / A2ER3
Temperature	“4”	— ••••	A1ER4 / A2ER4
Clutch Motor	“5”	— •••••	A1ER5 / A2ER5
Throttle Motor	“6”	— ••••••	A1ER6 / A2ER6

### H102/H102A Control Head Error Code

On Display	Error cause	Buzzer	Treatment
Err 1	Communication	“1”	Check CAN BUS connector wiring Check motor broken
Err 2	Memory	“2”	Check Dip switch & Function set up Check Calibration data
Err 3	Sensor	“3”	Check sensor connector wiring Check sensor broken
Err 4	Temperature	“4”	Check temperature of main board

### Error code display on A102 Actuator

\*H1=Station 1  
\*H2=Station 2  
\*H3=Station 3  
\*H4=Station 4

Error cause	Buzzer	Buzzer Pulse	On Display
Communication	“1”	— •	H1ER1 / H2ER1 / H3ER1 / H4ER1
Memory	“2”	— ••	H1ER2 / H2ER2 / H3ER2 / H4ER2
Sensor	“3”	— •••	H1ER3 / H2ER3 / H3ER3 / H4ER3
Temperature	“4”	— ••••	H1ER4 / H2ER4 / H3ER4 / H4ER4

### Error code display on H102/ H102A Control Head

\*H1=Station 1  
\*H2=Station 2  
\*H3=Station 3  
\*H4=Station 4

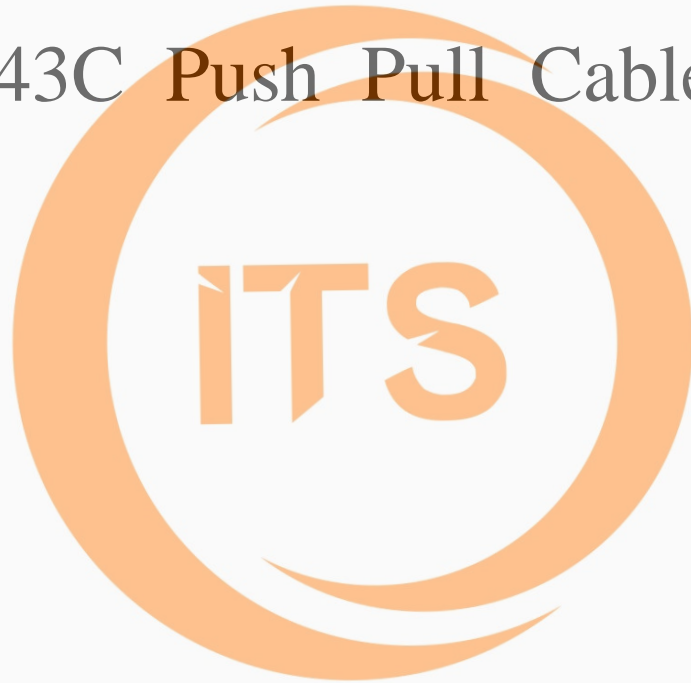
Error cause	Buzzer	Buzzer Pulse	On Display
Communication	“1”	— •	H1ER1 / H2ER1 / H3ER1 / H4ER1
Memory	“2”	— ••	H1ER2 / H2ER2 / H3ER2 / H4ER2
Sensor	“3”	— •••	H1ER3 / H2ER3 / H3ER3 / H4ER3
Temperature	“4”	— ••••	H1ER4 / H2ER4 / H3ER4 / H4ER4

# **KC102 Series Engine Control System**

## Chapter 5

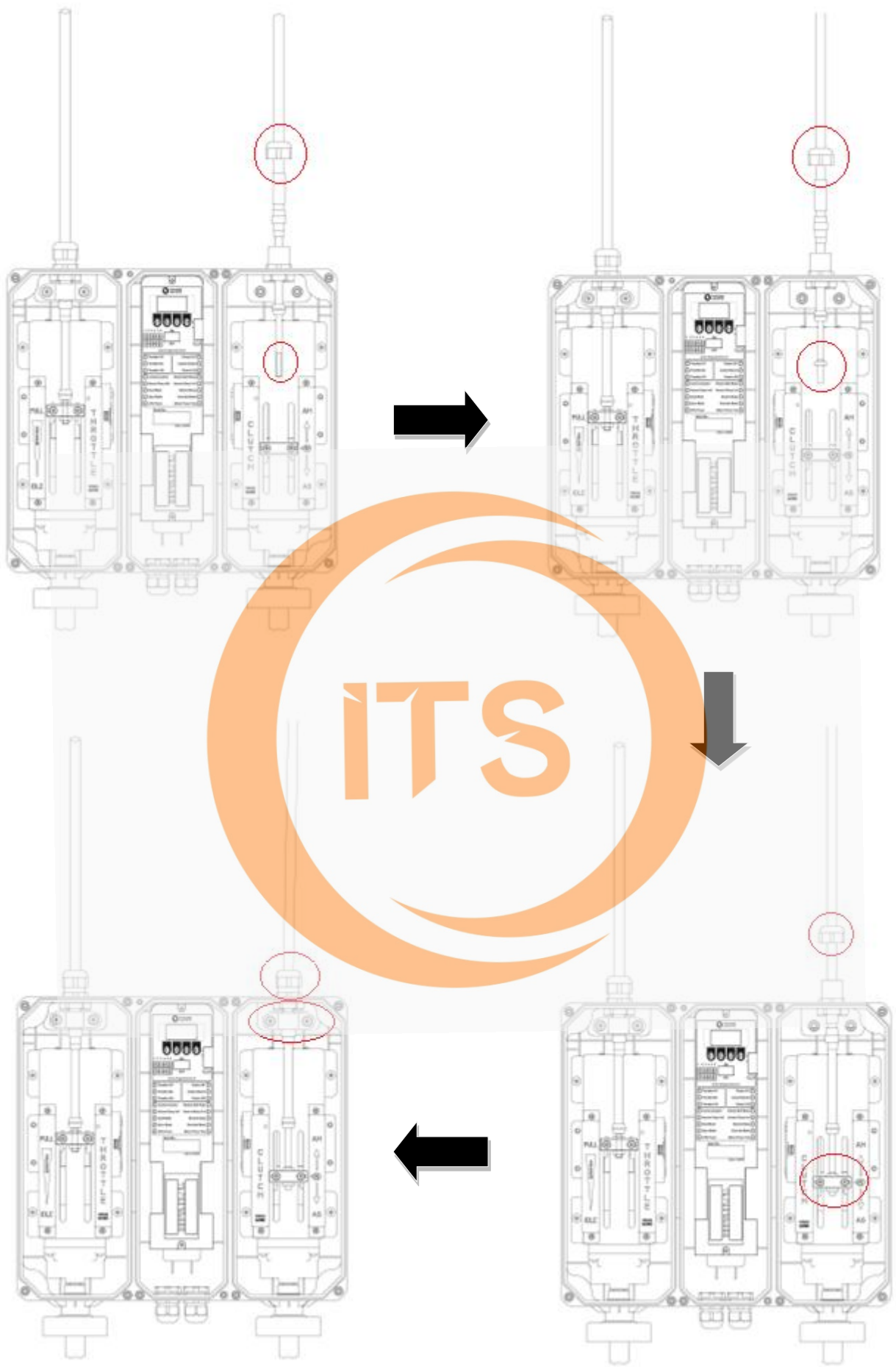
### Installing the

43C Push Pull Cable



## 5.Installing the 43C Push pull cable

- 5.1 Power off supply to the system.
- 5.2 Install the 43C push pull cable on the throttle module & clutch module of the Port actuator unit.
- 5.3 Power up the system and check the 43C cable to the port engine Governor lever is the correct direction.
- 5.4 If the direction is reverse, then switch off power.  
Set DIP switch 2 to ON on Port actuator unit
- 5.5 Switch on power and check if direction is correct.
- 5.6 Connect the 43C cable to the Port engine governor and gear box.  
Use the 43C connection kit provided.
- 5.7 Install the 43C push pull cable on the throttle & clutch module of the Starboard actuator unit.
- 5.8 Power up the system and check the 43C cable to the starboard engine governor lever is the correct direction.
- 5.9 If the direction is reverse, then switch off power.  
Set DIP switch 2 to ON on Stbd actuator unit.
- 5.10 Connect the 43C cable to the Stbd engine governor and gear box.  
Use the 43C connection kit provided.
- 5.11 Connect the 43C cable to the Stbd engine governor and gear box.  
Use the 43C connection kit provided





# **KC102 Series Engine Control System**

## Chapter 6

### Throttle Module Clutch Module

Stroke Adjustment



## 6. Throttle module & Clutch module stroke adjustment

- 6.1 On the A102 actuator unit, Set DIP switch 6 to ON
- 6.2 Power up system. Press Select on station1 to stop the buzzer.
- 6.3 Press S1 until “test” Press S4, display shows TH-UP  
(Throttle distance data, mm)
- 6.4 Press S4, Display shows data for throttle position.  
Use the manual override control and move throttle to max.  
Record reading as 4-xx
- 6.5 Press S4, save to Throttle up distance
- 6.6 Display shows data for throttle position TH-DN.  
Use the manual override control and move throttle to min.  
Record reading as 3-xx
- 6.7 Press S4, save to Throttle down distance
- 6.8 Display shows data for clutch position CL-UP  
Use the manual override control and move clutch to fully up.  
Record reading as 2-xx
- 6.9 Press S4, save to Clutch up distance
- 6.10 Display shows data for clutch position CL-DN  
Use the manual override control and move clutch to fully down.  
Record reading as 1-xx
- 6.11 Press S4, save to Clutch down distance
- 6.12 Press S2 until “END”, press S4(Actuator may move)

# **KC102 Series Engine Control System**

## Chapter 7

### RESET TO

FACTORY  
DEFAULT

ITS

## 7.Reset to Factory Default

7.1 DIP switch 6 On

7.2 Press S1 until “Funct”

7.3 Press S4 to enter

7.4 Press S2 until A-SET

7.5 Press and hold S4 for 02s with beep sound and release.

7.6 Display shows END

7.7 The software is now reset to factory default.








# KC102 Series Engine Control System

## Chapter 8

### A102 Actuator Function List

“●” Factory default

Clutch forward distance			
F01	●	20	Clutch Forward distance set(mm) Minimum: 20mm Maximum: 37mm
	20	~ 37	 Make sure Clutch Reverse/Normal selection key ON or OFF on Dip switch “3”
Clutch reverse distance			
F02	●	20	Clutch Reverse distance set(mm) Minimum: 20mm Maximum: 37mm
	20	~ 37	 Make sure Clutch Reverse/Normal selection key ON or OFF on Dip switch “3”
Throttle maximum limit range			
F03	●	50	Throttle maximum limit range set(mm) Minimum: 50mm Maximum: 75mm
	60	~ 75	 Make sure Throttle Reverse/Normal selection key ON or OFF on Dip switch “2”
Throttle start point			
F04	●	00	Throttle start point set(mm) Minimum: 00mm Maximum: 30mm
	10	~ 30	 Make sure Throttle Reverse/Normal selection key ON or OFF on Dip switch “2”
Neutral delay time			
F05	●	10	Neutral delay time set Minimum: 10(1.0 sec) Maximum: 50(5.0 sec)
	30	~ 50	

Throttle delay time			
F06	•	10	Throttle delay time set Minimum: 10(1.0 sec) Maximum: 30(3.0 sec)
	20	~ 30	
Crash stop			
F07	•	00	Clutch delay can occur set a fixed time control Minimum: 00(0 sec) Maximum: 15(15 sec)
	10	~ 15	
Crash stop to travel time			
F08	•	03	On clutch delay ready, delay terminated time by movement Minimum: 03(0.3 sec) Maximum: 20(2.0 sec)
	20	~ 20	
Main board temperature			
F09	•	40	Actuator main board's temperature set Minimum: 40(40 degree) Maximum: 70(70 degree)
	60	~ 70	
Single / Dual mode			
F10	•	0	Single Mode
	1	1	Dual Mode  Make sure station STBD/PORT selection key ON or OFF on Dip switch “1” Make sure SYNC. STBD/ PORT selection key ON or OFF on Dip switch “4”

## WARRANTEE CERTIFICATION

This product is passed “KINGS MARINE CO., LTD”’s strict quality test.

If there is defect of manufacturing or abnormal detection within warrantee period, please contact our Agent or Distributor with this Warrantee Certification.

## WARRANTEE CLAUSE

**1. The Warrantee period, we can guarantee, is one(1) year from your purchasing date**

**2. Warrantee Exception Clause**

- Warrantee period is expired.
- Any kinds of Mal-function or defection caused by Modification or Repair without KINGS MARINE’s permission.
- Any kinds of Mal-function, Defection, or External damage, caused by operator
- Any kinds of Mal-function, Defection, caused by using spare part from Non-Authorized Distributor or Agent.
- Any kinds of Mal-function, Defection, caused by not following Warnings or Cautions mentioned on this manual.
- Any kinds of Mal-function, Defection caused by “Force Majeur”, like Fire, Flood.
- Without presentation of this “**Warrantee Certification**”.