Jet Thruster

DOCK YOUR
BOAT EASILY

Manufactured by
Holland Marine Parts B.V.

Services manual Jet Thruster
2011 - Present Models
& Dufour Factory installations

www.jetthruster.com

Jet Thrusters:
JT-30 / JT-50 / JT-70 / JT-90

D-037-01

D-037-01

CE

HOLLAND
MARINE PARTS
WE KEEP YOU MOVING!

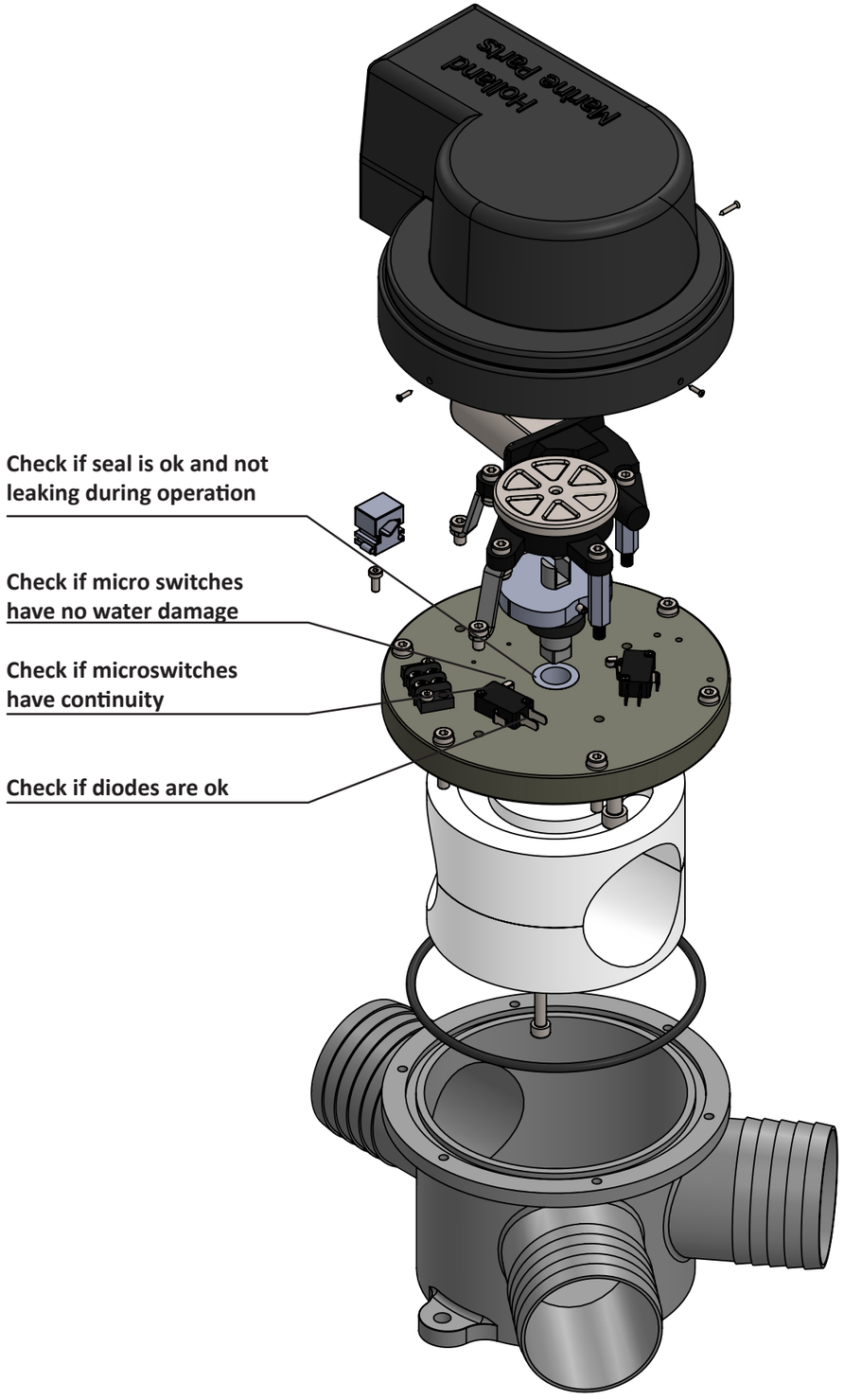
2011 - 2016 models electrical controls

Jet Thruster Single (bow or stern only)

- Continuty check list
- 3-way valve
- Electrical lay out
- Return shipment / RMA

Look for terminals at pump unit to identify the single system.

3-Way valve exploded view



Continuity, Function and Connection Test: Jet Thruster Single

Connection and Continuity Test

Make sure all connections are according to the installation manual or verified with following Checklist:

Make sure all batteries are fully charged

Terminal Connections on Pump Unit

A and **B**: From Joystick **A B** connection, to Pump unit **A B** Screw Terminal Connection.

If unmarked: ABCD can be recognized at Pump Unit Blue Finder Relay socket by:

A B, joystick connection: Run to/from diode side on relay relay socket 94.74

C D Valve connection: Run to/from crossed cable side on relay socket 94.74

C D E: From pump unit **C D E** connections, to 3-Way Valve **C D E** screw terminal connection.

E: E is internally connected with the Coil at Finder or IDEC Mini Relay and will receive power from the 3-Way valve after it has turned.

F: Powered by the Mini Relay or IDEC Relay at the pump, **F** engages the Contactor solenoid and provides auxiliary power to connect an optional Series Parallel Switch and/or Electrical Air valve.

G: Ground, connect with Battery Minus. **G** is the main ground position in the control circuit. It should be connected to the Negative of the primary Jet Thruster battery which also should be connected to the ground of any other battery on board. The Optional Series Parallel switch and/or Electrical Air valve grounds are also connected to **G**

+: **12v +**, from primary side of Joystick.

Note: For safety reasons, the Jet Thruster is protected with a Thermal overload protection. The Finder Mini Relay or IDEC Relay at the pump unit is grounded to the Pump Unit via by Thermal Protection Sensor. This sensor is located inside the DC pump motor.
In case of a overheated Pump Motor, this sensor, as it functions as ground for the Mini Relay, will break ground and therefore the Control circuit cannot engage. When the motor has cooled down, the sensor automatically restores ground to the Finder Mini Relay.

Note: (accidently) providing 12V+ to the Thermal sensor will immediately damage it.

Continuity check

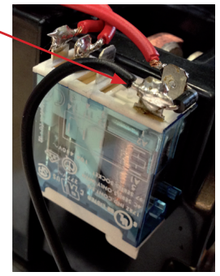
Step 1: Using a multimeter, measure the 12V+ (Service Battery which should be used to power the control circuit) and **G** screw connector. This should read 12V

If not: Battery minus needs to be connected to **G**.

Note: Between +, and G Screw Connector at Pump Unit a minimum of 12 volt and maximum 14 volt should be measured. The system operates at 12V. ***24V will damage the control circuit.***

Step 2: Push the button at the Joystick panel and check for blue light.

Measure (**+**) connector and Thermal sensor at Pump Unit: This should read 12V (Thermal sensor connection can be reached at the Mini Relay ,the ground connection of this relay at the diode side (black wire)



No voltage: Thermal protection defective: Needs to be replaced. System will not work without it.

Or Jet Thruster Pump Unit is not grounded

Step 3: **Let someone hold the joystick in continuous position to port or starboard.**

- Measure **G** and **A** or **B** (+12V)
- Measure **C** and **D** (+12V or -12V) Voltage inverts when changing joystick from port to starboard.

Step 4: **Let someone hold the joystick in continuous position to port or starboard.**

Measure G and E (+12V)
If there is not a +12V to E: Check CDE connection on the valve
If Correct CDE on the valve: Reverse valve motor connection Red and Black.

Step 5: **If there is a 12v+ plus to E but system does not activate:**

Measure G and F (+12V)
In case of no +12V plus signal to F:
- Or - Mini relay defective
- Or - no +12V to + screw terminal connection
- Or - Thermal Protection defected

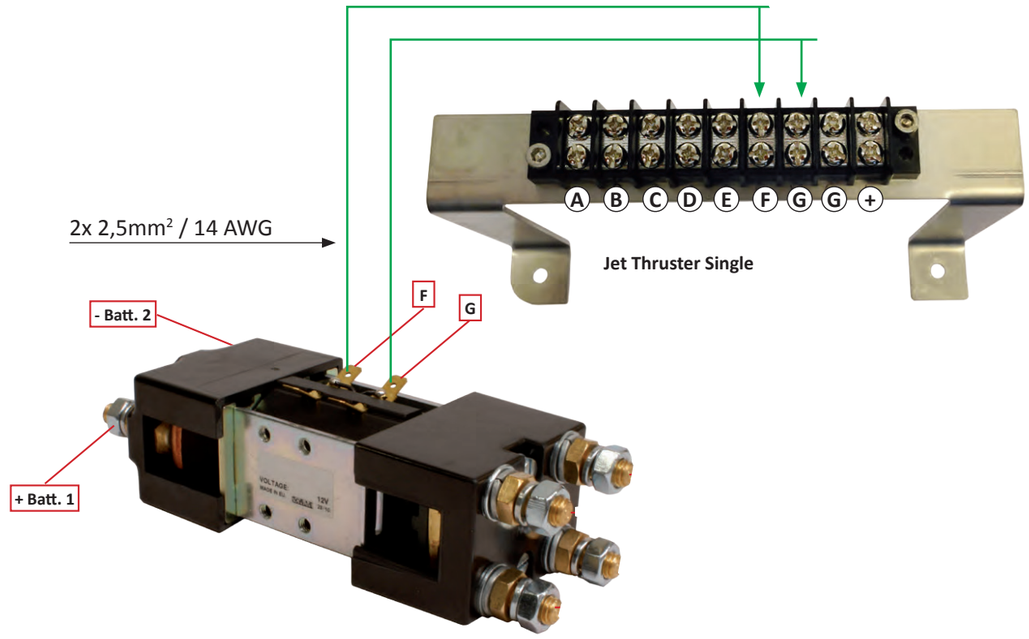
In case of a 12V plus signal to F, but no engagement of Pump Unit:
Or - Defective Contactor-solenoid, loose/damaged connection.
Or - Main fuse, or Main switch to pump unit defective of not engaged
Or - Wrong connected Jet Thruster Battery(s)

Check Function of series-parallel switch

The Series Parallel Switch creates a temporary 24V environment out of two 12V batteries to power the DC motor from the pump unit.

The switch itself operates at 12V. The moment the Jet Thruster system activates, 12V power activates the coil that makes the switch connects the battery cables. Automatically the connection will break if the Jet Thruster stops running.

- Connect F and G from the Series Parallel Switch with F and G at the pump unit. Use a 2x 2,5mm2 cable.



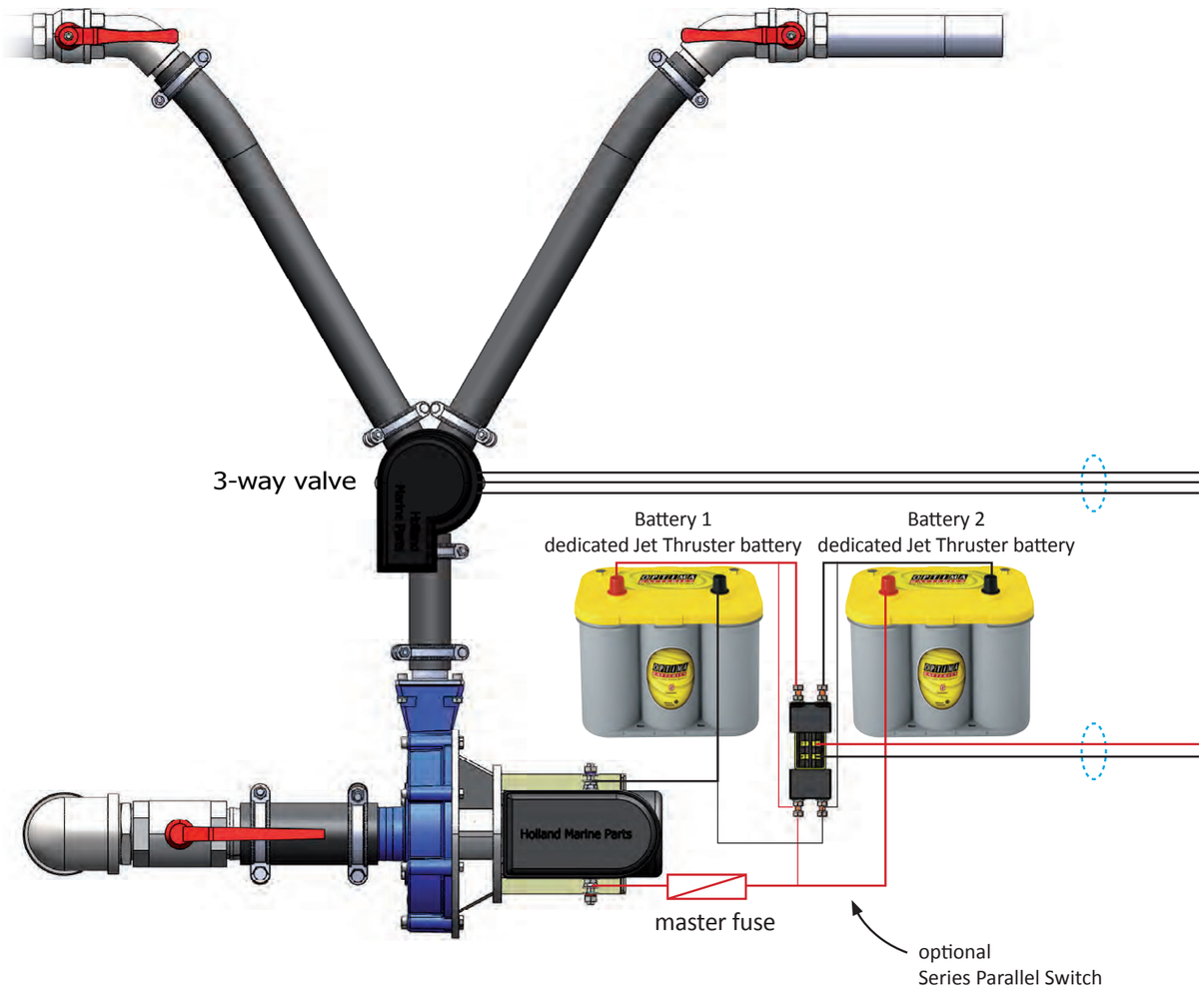
Note if the Series Parallel Switch does not work!!
The Jet Thruster will run at 12V.
This implicates that less thruster force will be provided by the pump unit.

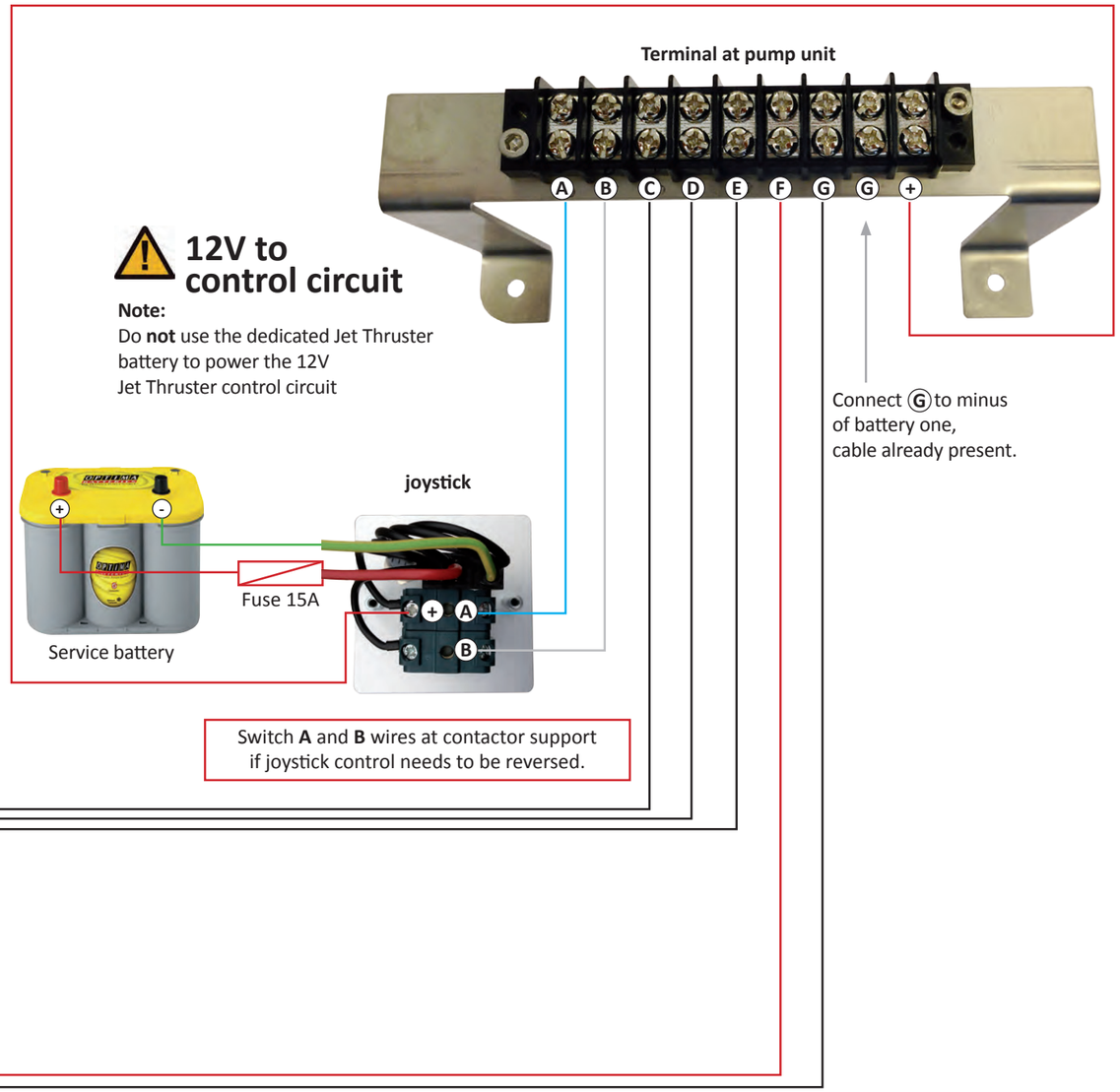
Electrical Installation Jet thruster Single

Battery cable length max 1m/3.3ft in total:

Positive: max 50cm/20”
Negative: max 50cm/20”

- **Battery Positive to free contact at contactor relay**
- **Connect A connection from pump unit to battery negative**

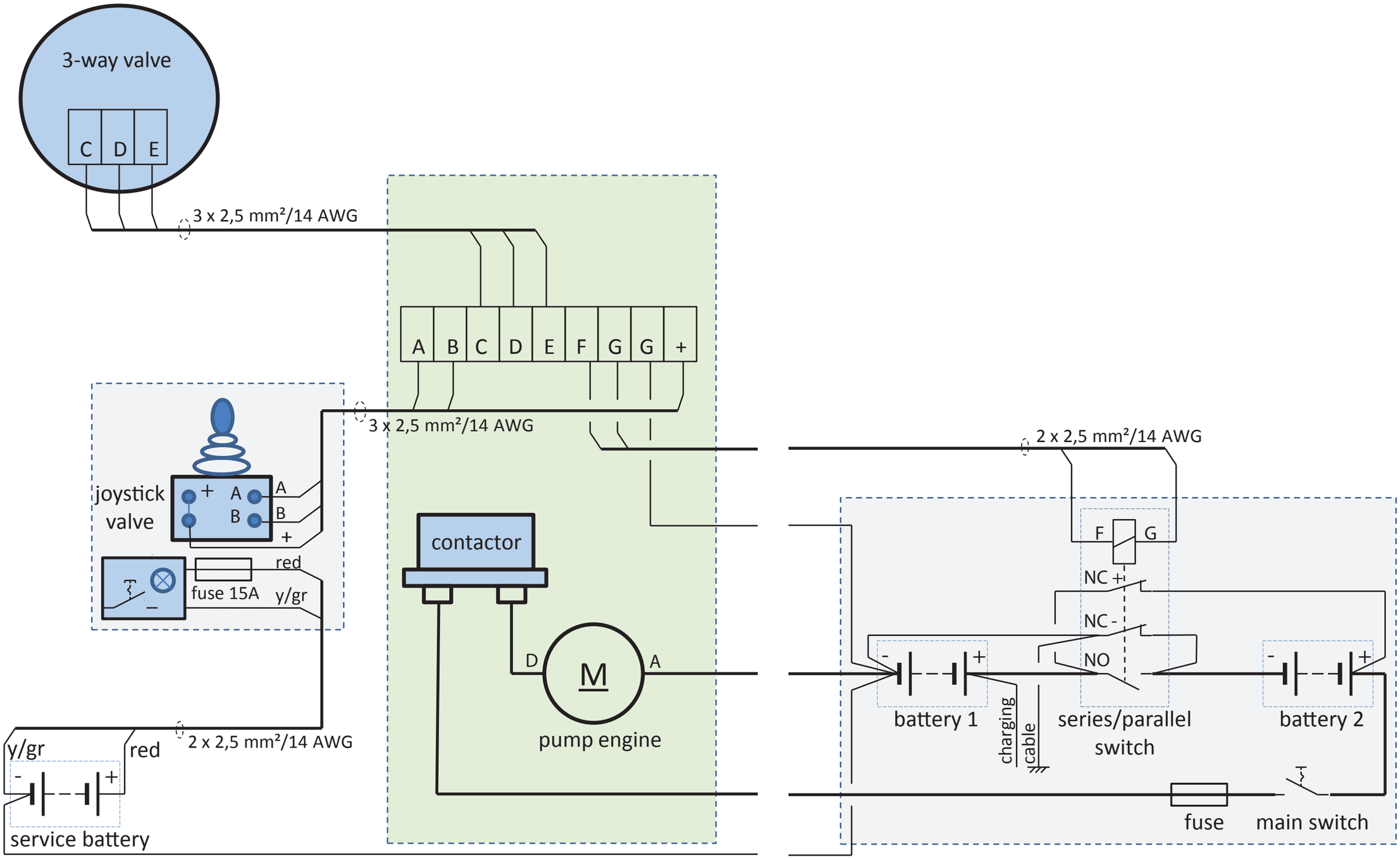




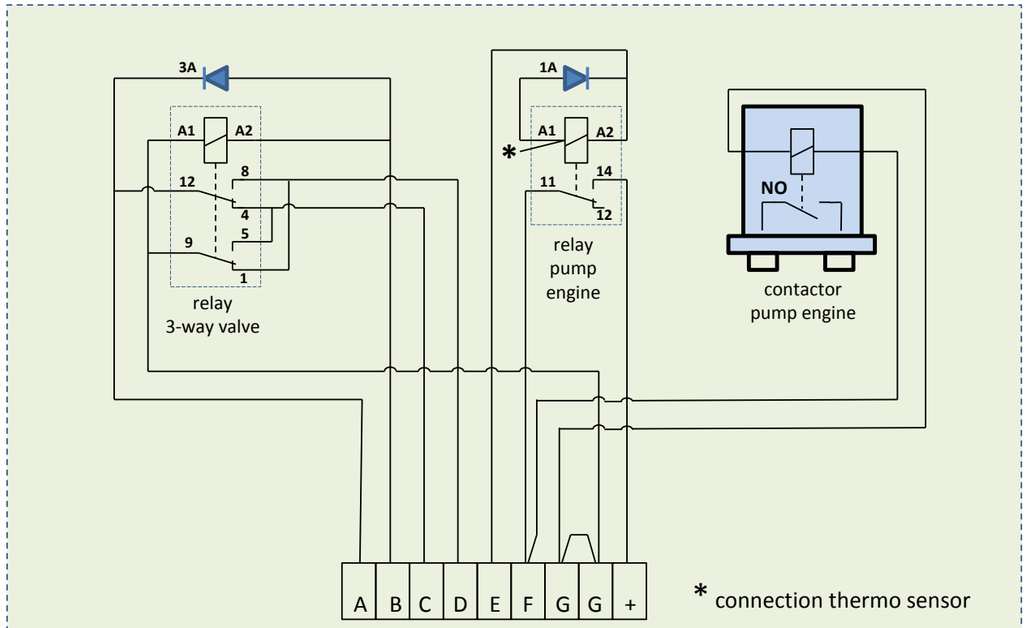
+ Serie Parallel Switch / Electrical Air valve to: **F**

- Serie Parallel Switch / Electrical Air valve to: **G**

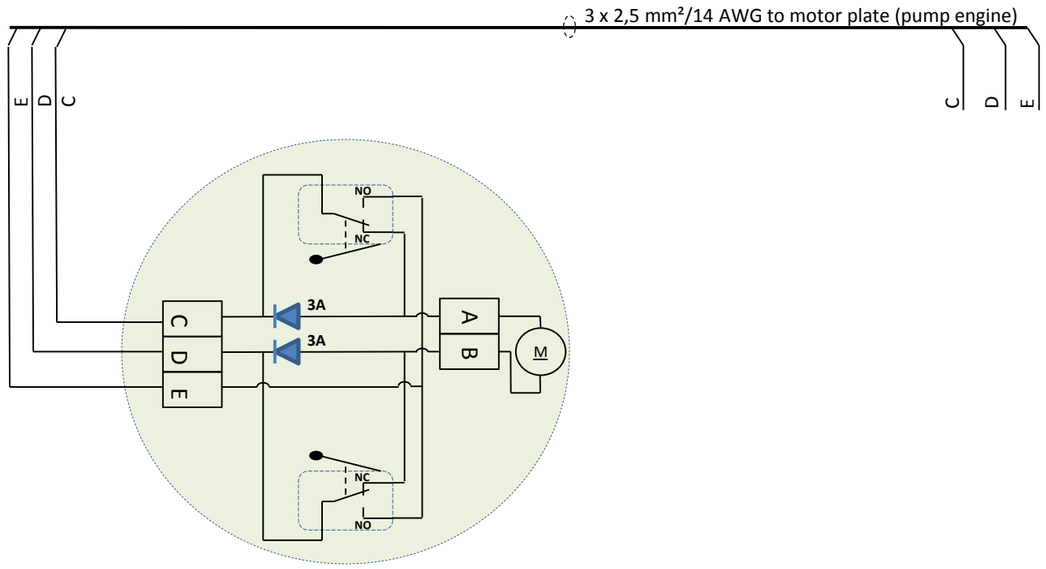
Electrical diagram Jet Thruster single



Motor plate (pump engine)
JT-xx Single



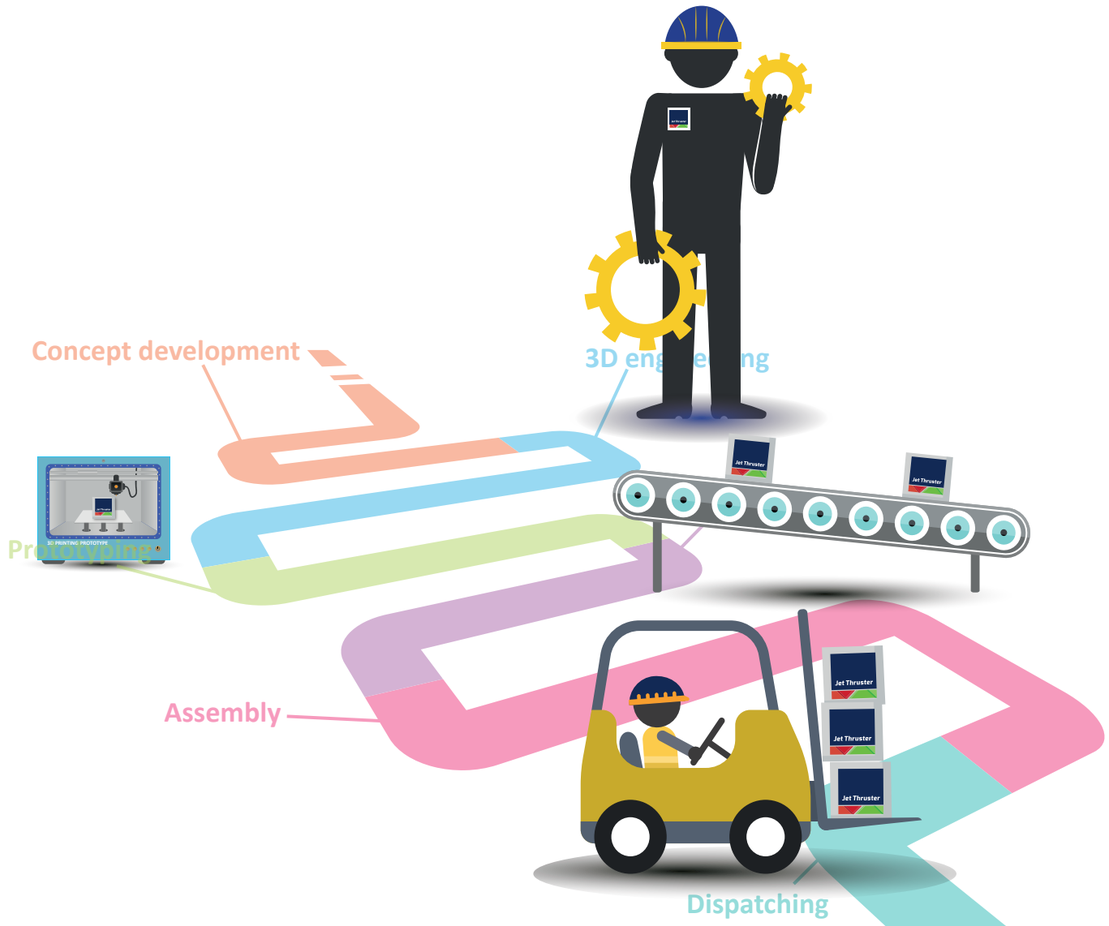
3-way valve
JT-xx Single



3-way valve

RMA (Return Material Authorization)

- Take picture of sticker on top of Jet Thruster motor
- Send the picture to: **service@hollandmarineparts.nl**
- You will receive a RMA Form to pack with the part and send back.



2011 - 2016 / early 2017 models

Jet Thruster Combi (bow and stern)

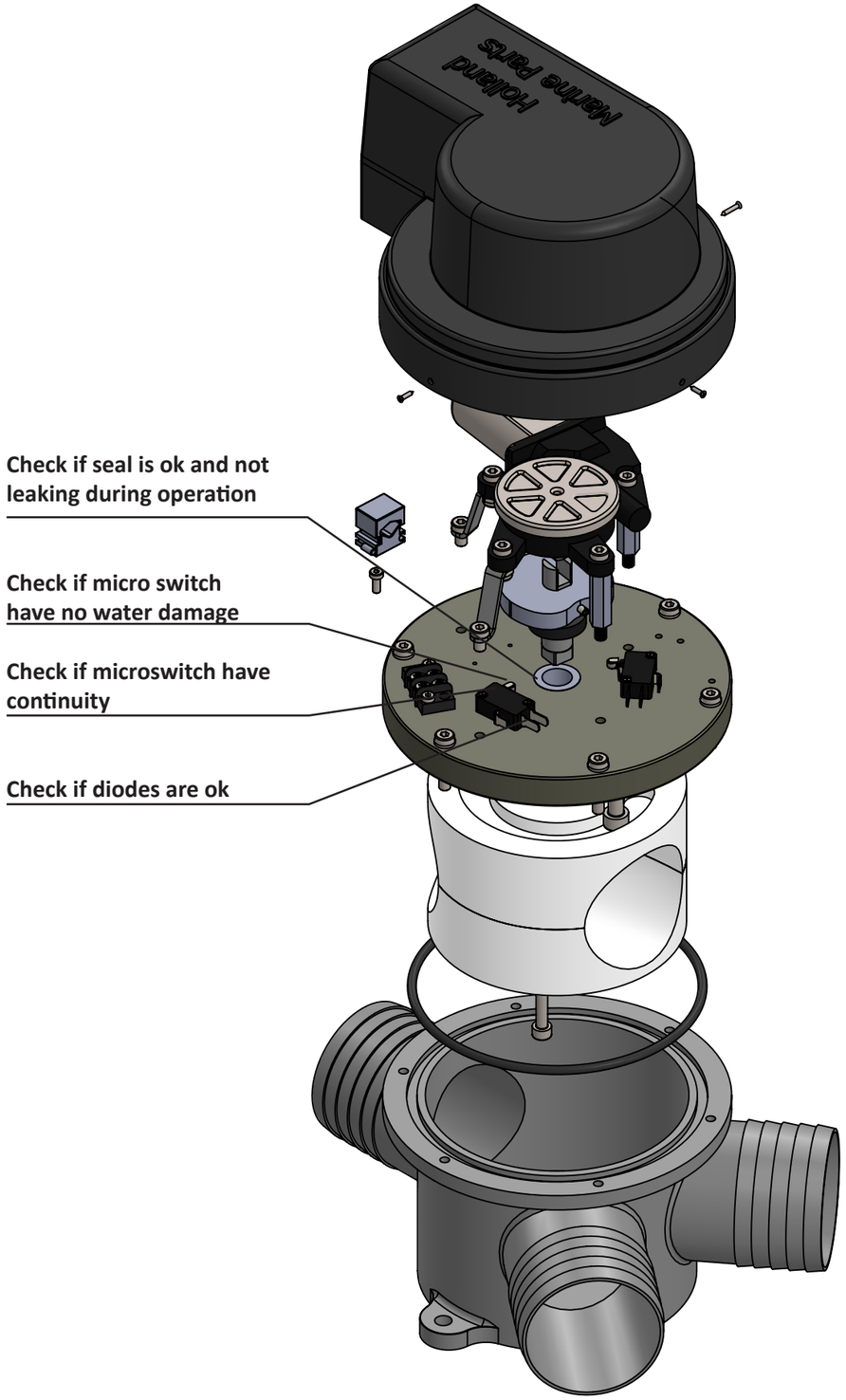
Dufour yacht installation

- Continuty check list
- 3-way valve
- Electrical lay out
- Return shipment / RMA

Look for terminals at pump unit to identify the combi system.

3-Way valve exploded view

Note: Combi 3-Way valve has 4 microswitches this exploded view shows just 2.



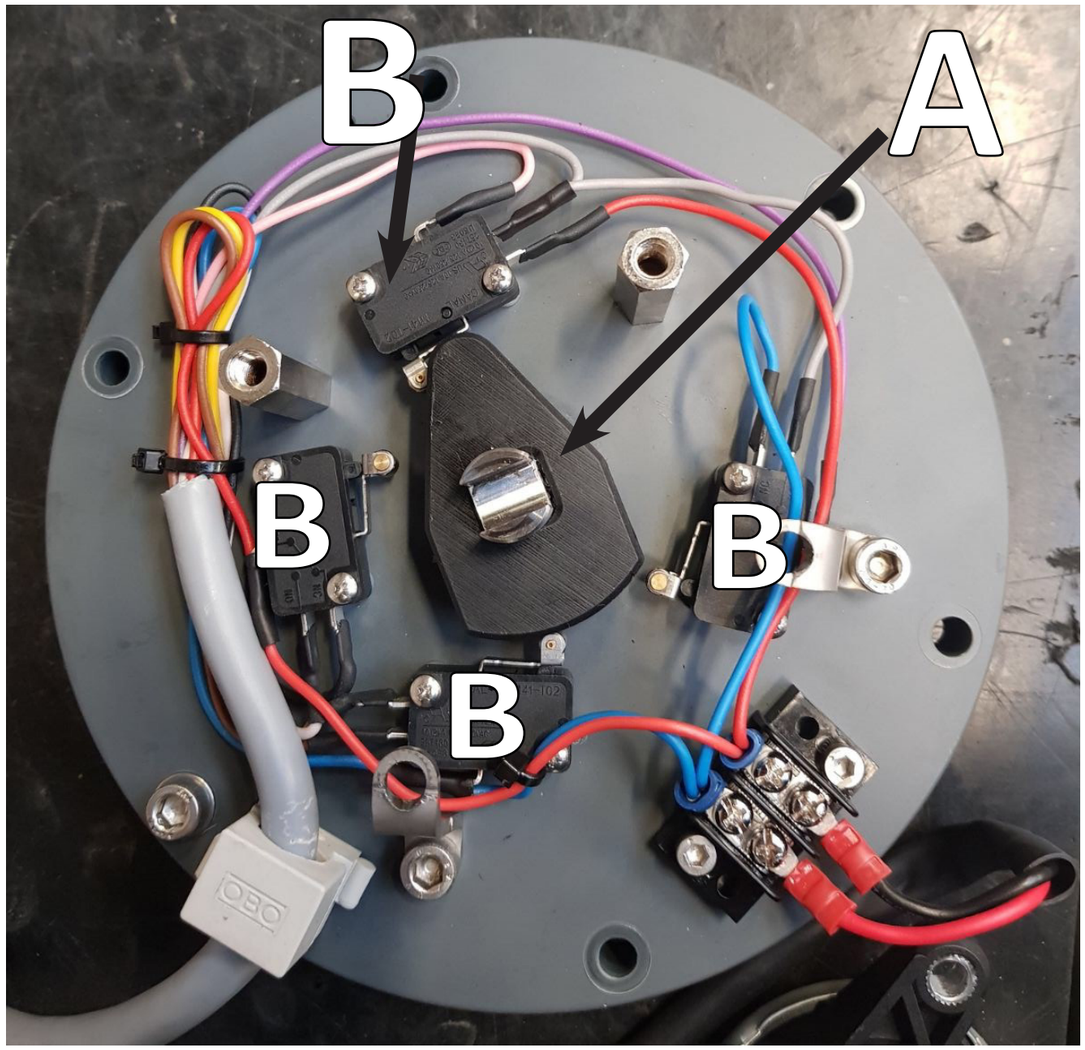
Check directional 3-way valve

Warning - Dont hold fingers between the moving parts!!

In case the boat is in water:

- Check if seal is leaking: One person must start Jet Thruste, other person must check if seal (A) is leaking!

- Check for signs of corrosion of microswitches (B)



Function and Connection Test: Jet Thruster Combi / Dufour Factory Installations:

☐ **Check if all batteries are ok.**
Do they all have the same voltage?

☐ **Check all Battery cable connections:**
Make sure all Battery cables are fixed. Loose connections are very dangerous

☐ **Is there any problem with the Pump?**
Do you see excessive sparkling? If yes, contact Holland Marine Parts

☐ **Do you see brown leak water coming from the pump, or pump inlet section / pump outlet part?**
This could be caused by corrosion. Parts must be inspected and replaced. Zinc Anode system must be added to the Jet Thruster system

☐ **In case the boat is in the water:**
Run the Jet Thruster system: Do you hear a strange sound, like perhaps somehow the intake valve is not 100% open?

☐ **In case the boat is on the land:**
Check with flashlight, something is blocking, or stick in the inlet filter? If the boat is out, you can look in the system if anything is block it.

☐ **Do you hear a cavitation sound from the pump?**
The pump will make more noise if the inlet is closed or blocked

☐ **Can you check inside the nozzles:**
Is nozzle being blocked from the inside?

☐ **Follow every centimetre of the hose to check if the are pinched?**
If this happened, for sure the water cannot pass easy

☐ **Does the Series Parallel Switch work?**
In case the system is running with low power output, it might be possible that the Series-Parallel switch is not working. It should click in when you sart the system. If it does not click in, but the pump is running, the Jet Thruster pump is running at 12V instead of 24V

☐ **In case of low power, but correct functioning Series Parallel Switch:**
Measure with Voltage meter at the following terminals at the Pump: Contactor + (positive) bolt and Minus bolt at the pump: If the pump is running, how much voltage do you measure?
(Do not measure at the battery, only at the pump connections, and under load of the running pump

☐ **Do you hear a higher RPM of impeller?**
The Ventilator will run with a high sound level. This indicates water inlet could be blocked, impeller could be broken, or pump is blocked on the inside

☐ **Do you see black dust coming from the carbon brushes?**
This will happen when battery cables are too long, or not in right size. Batteries must be relocated closer to the pump, battery cable must be reduced in length, and motor must be serviced. Send back pump to Holland Marine Parts

☐ **Is the system not working at all?**
Check 15A fuse behind the control panel (+12V from Service batteries power the control circuit)

☐ **Do you hear the Directional 3-Way Valve work normal (Turning left and right normal) and do you also hear the clicking sound of the contactor at the pump unit, but pump does not start?**
Check if Jet Thruster battery main switch is on. Check continuity on the Main Switch terminals: Does the switch work as it should?
Check if ANL fuses are ok
Check if Jet Thruster batteries are ok

☐ **Does the system works to port or stard board only?**
Remove the black plastic cover from the Directional 3-way valve. Check with following procedure:

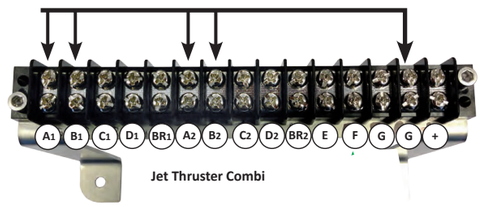
☐ **Do you see any trace of water, salt or corrosion on the black micro-switches. If one switch is corroded, the system will not work properly**
Do you see water coming from the Shaft seal?
It could be possible that the shaft seal works properly, but the leak only happens when the system is running: One person must start the system, one person must check what happens after the system start.
In case the seal is leaking, contact Holland Marine Parts for spare parts

☐ **In case there is no visible sign of damage to the components, but the system is not working, an electrician must used the diagram which are published in this manual to search for the electrical error?**

☐ **Is the joystick, or Push Button panel not working?**
You need to check This can be checked, by measuring at the connections on the pump unit:
One person must push the joystick/button: Measure continuity between

If your voltage meter is showing +12V at these connections, the control Panel is working ok

A1 – G
B 1 – G
A2 - G
B2 – B



Jet Thruster Combi

In case the Control panel is ok, but the system is not responding:
Check Directional 3-Way Valve. Possible seal is leaking, causing electrical problems

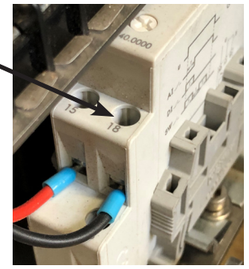
☐ **Electrical connections at Pump Unit:**

Make sure all screw connections are tight. Check each connection. Use electrical diagrams in this manual to learn about all connections.

A Time Relay is present at the Pump Controls. After you press the joystick to left or right, the relay activates and provides a 12V signal for 10 seconds. This signal is transferred into the control system and further down the line make it possible to turn the valve.

In case the Joystick controls work well, but the system does not respond: check between connection “18” at the relay, and G at the screw terminals if you read a 12V signal.

“G” = Ground and should be connected to the common ground in the boat

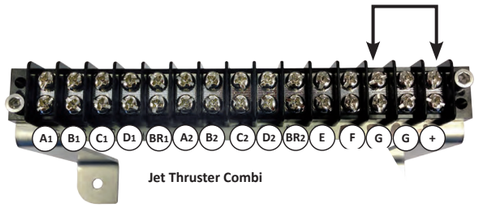


Do you hear Clicking sounds from the Pump Contactor? (You will hear a loud and fast mechanical clicking sound at the pump controls)
Low voltage of Service Battery. The Jet Thruster control Circuit is powered from the Service Battery. In case of low voltage, the Series-Parallel Switch, Main Contactor will start clicking rapidly.

Thermal protection sensor:

Note: For safety reasons, the Jet Thruster is protected with a Thermal overload protection. The Finder Mini Relay or IDEC Relay at the pump unit is grounded to the Pump Unit via by Thermal Protection Sensor. This sensor is located inside the DC pump motor. In case of a overheated Pump Motor, this sensor, as it functions as ground for the Mini Relay, will break ground and therefore the Control circuit cannot engage. When the motor has cooled down, the sensor automatically restores ground to the Finder Mini Relay.
Note: (accidently) providing 12V+ to the Thermal sensor will immediately damage it.

Continuity check



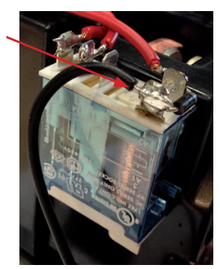
Step 1: Using a multimeter, measure the 12V+ (Service Battery which should be used to power the control circuit) and G screw connector. This should read 12V

If not: Battery minus needs to be connected to G.

Note: Between +, and G Screw Connector at Pump Unit a minimum of 12 volt and maximum 14 volt should be measured. The system operates at 12V. 24V will damage the control circuit.

Step 2: Push the button at the Joystick panel and check for blue light.

Measure (+) connector and Thermal sensor at Pump Unit: This should read 12V
(Thermal sensor connection can be reached at the Mini Relay ,the ground connection of this relay at the diode side (black wire)
No voltage: Thermal protection defective: Needs to be replaced. System will not work without it. Or Jet Thruster Pump Unit is not grounded

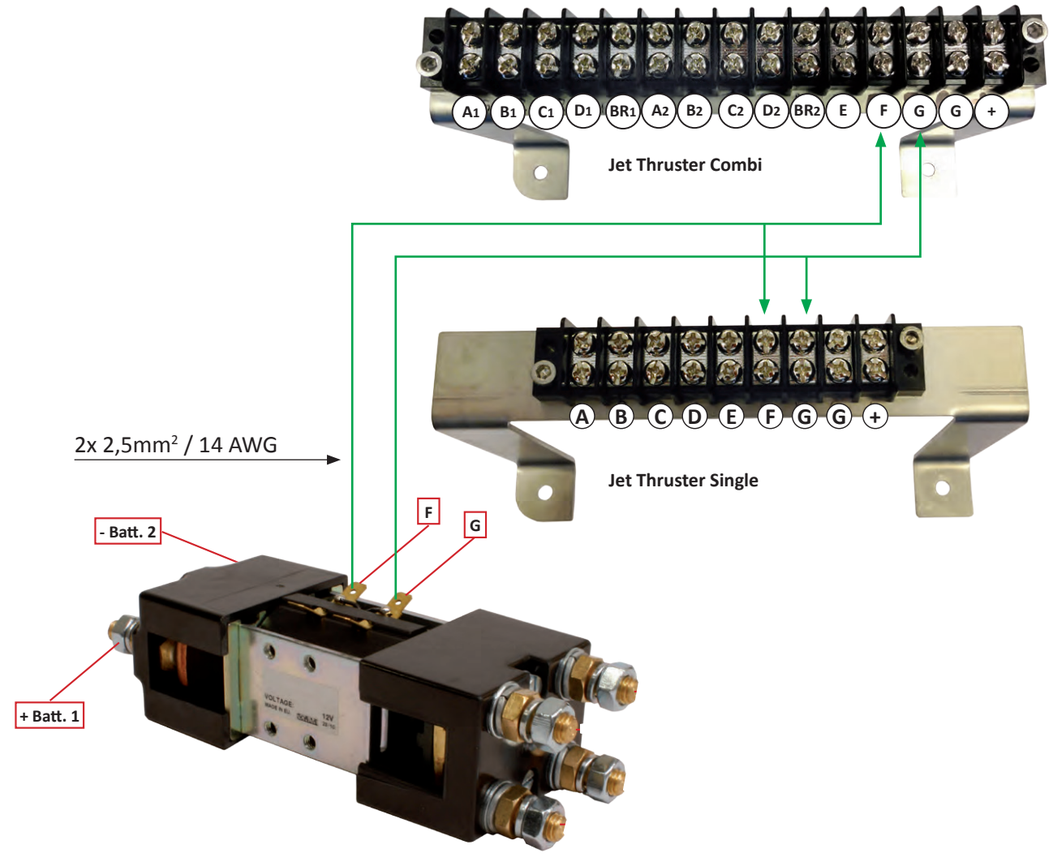


Check Function of series-parallel switch

The Series Parallel Switch creates a temporary 24V environment out of two 12V batteries to power the DC motor from the pump unit.

The switch itself operates at 12V. The moment the Jet Thruster system activates, 12V power activates the coil that makes the switch connects the battery cables. Automatically the connection will break if the Jet Thruster stops running.

- Connect F and G from the Series Parallel Switch with F and G at the pump unit. Use a 2x 2,5mm2 cable.



Note if the Series Parallel Switch does not work!!
The Jet Thruster will run at 12V.
This implicates that less thruster force will be provided by the pump unit.

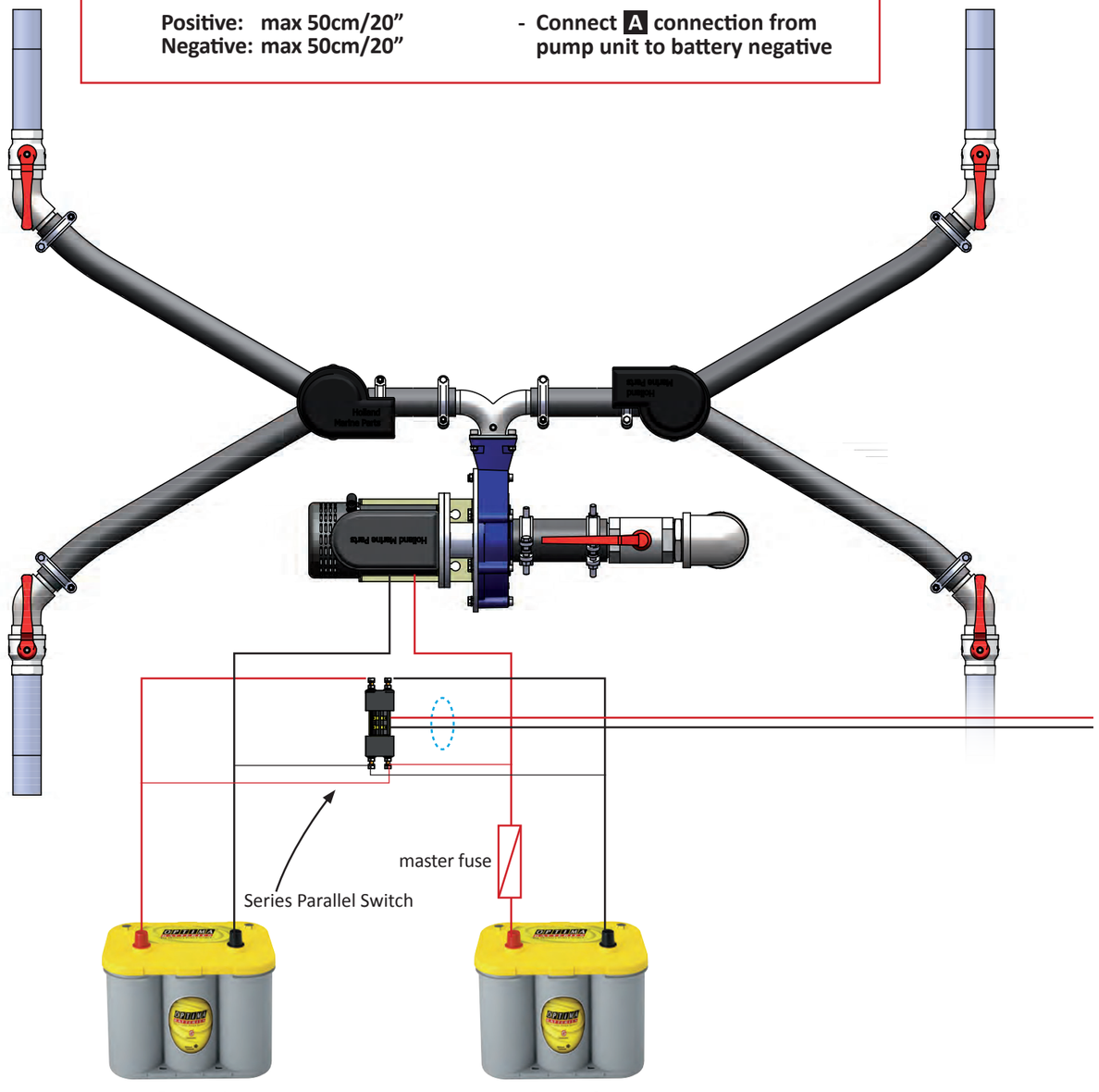
Electrical Installation Jet Thruster Combi

Is your boat is equipped with a 12V circuit but you need 24v to run the Jet Thruster?
Not a problem with use of our Series parallel Switch!
This system uses two dedicated 12V batteries to create a temporary 24V circuit that powers the 24V Jet Thruster.

Battery cable length max 1m/3.3ft in total:

Positive: max 50cm/20”
Negative: max 50cm/20”

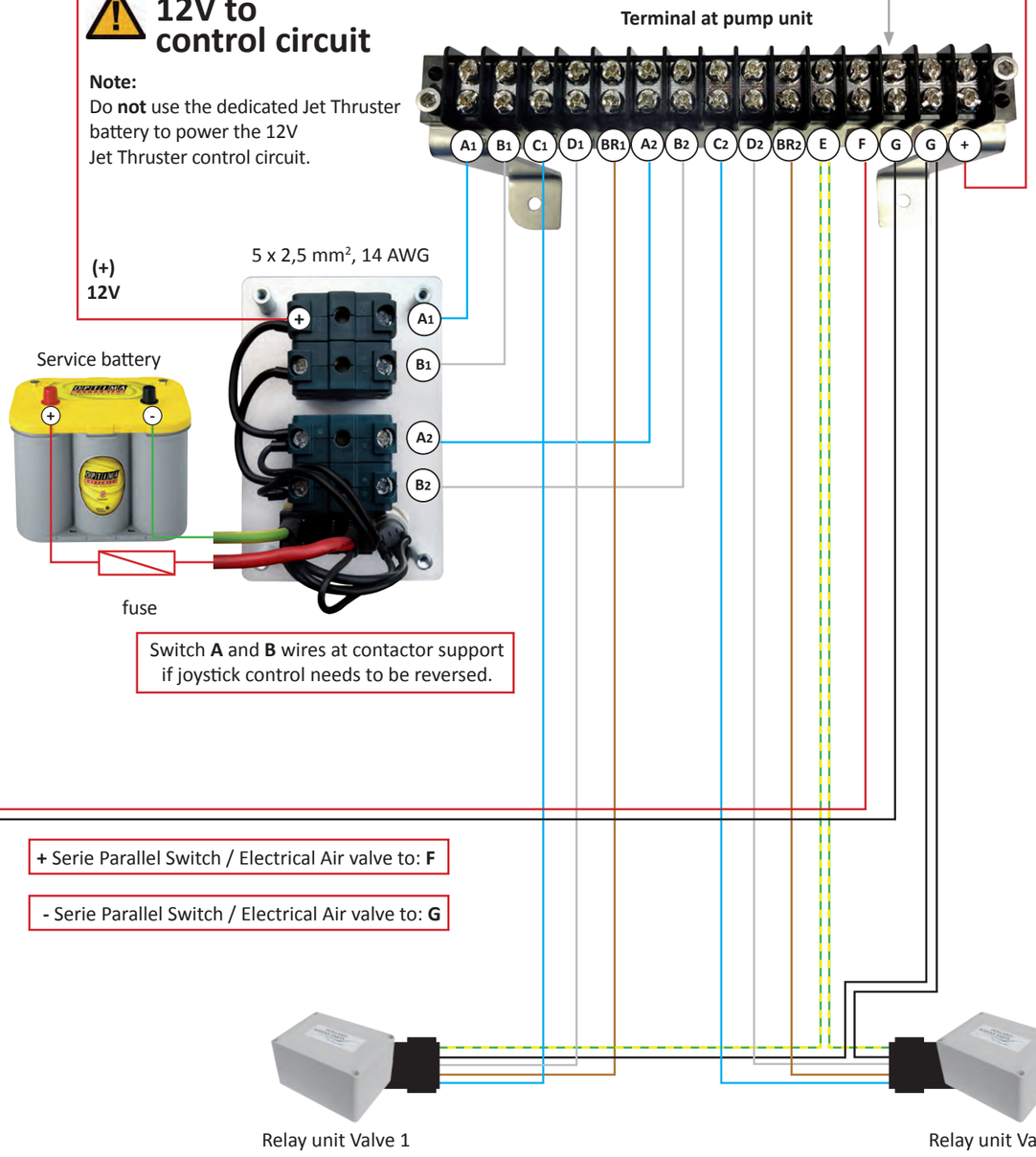
- **Battery Positive to free contact at contactor relay**
- **Connect A connection from pump unit to battery negative**



Connect Ⓖ to minus of battery one, cable already present.

12V to control circuit

Note:
Do **not** use the dedicated Jet Thruster battery to power the 12V Jet Thruster control circuit.

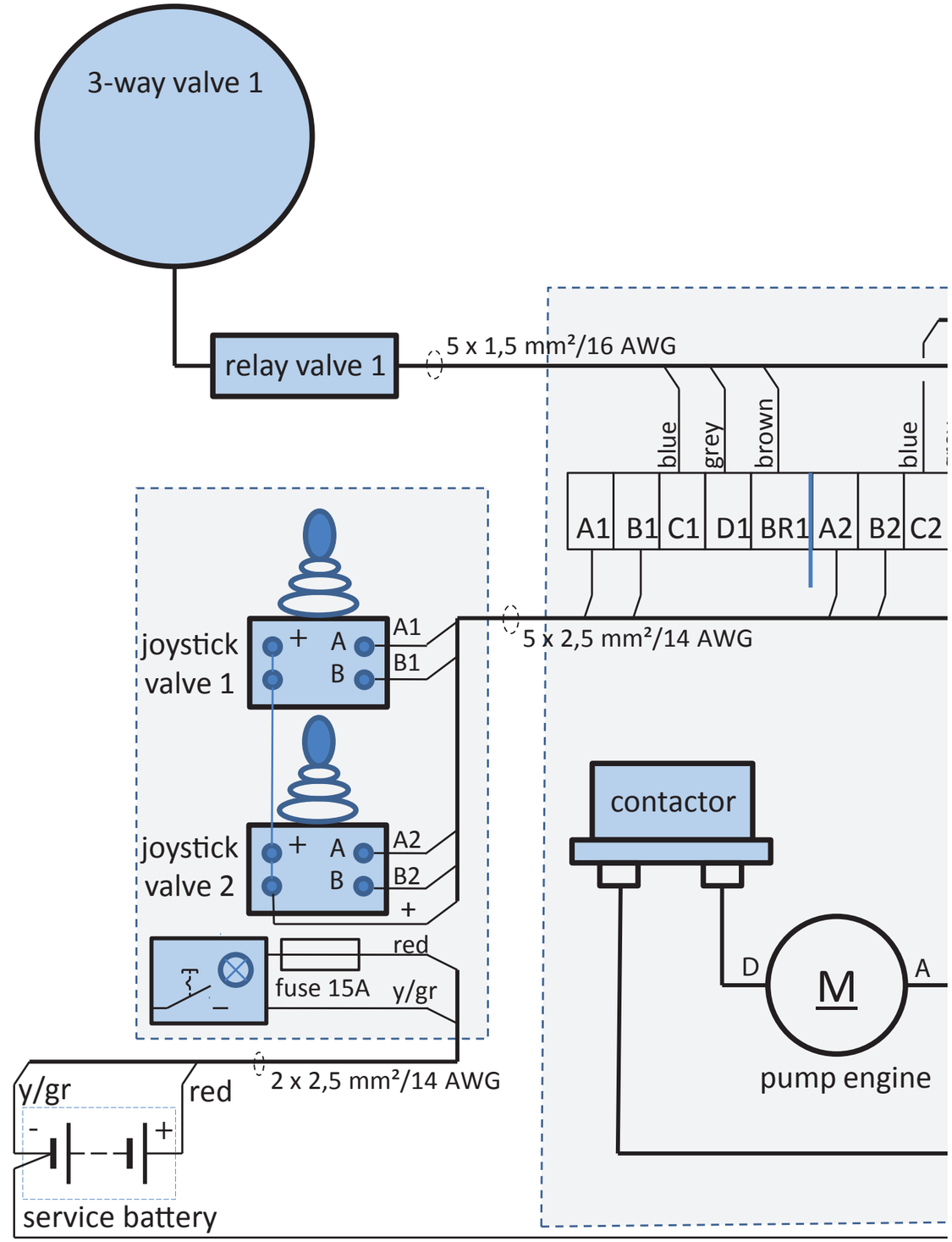


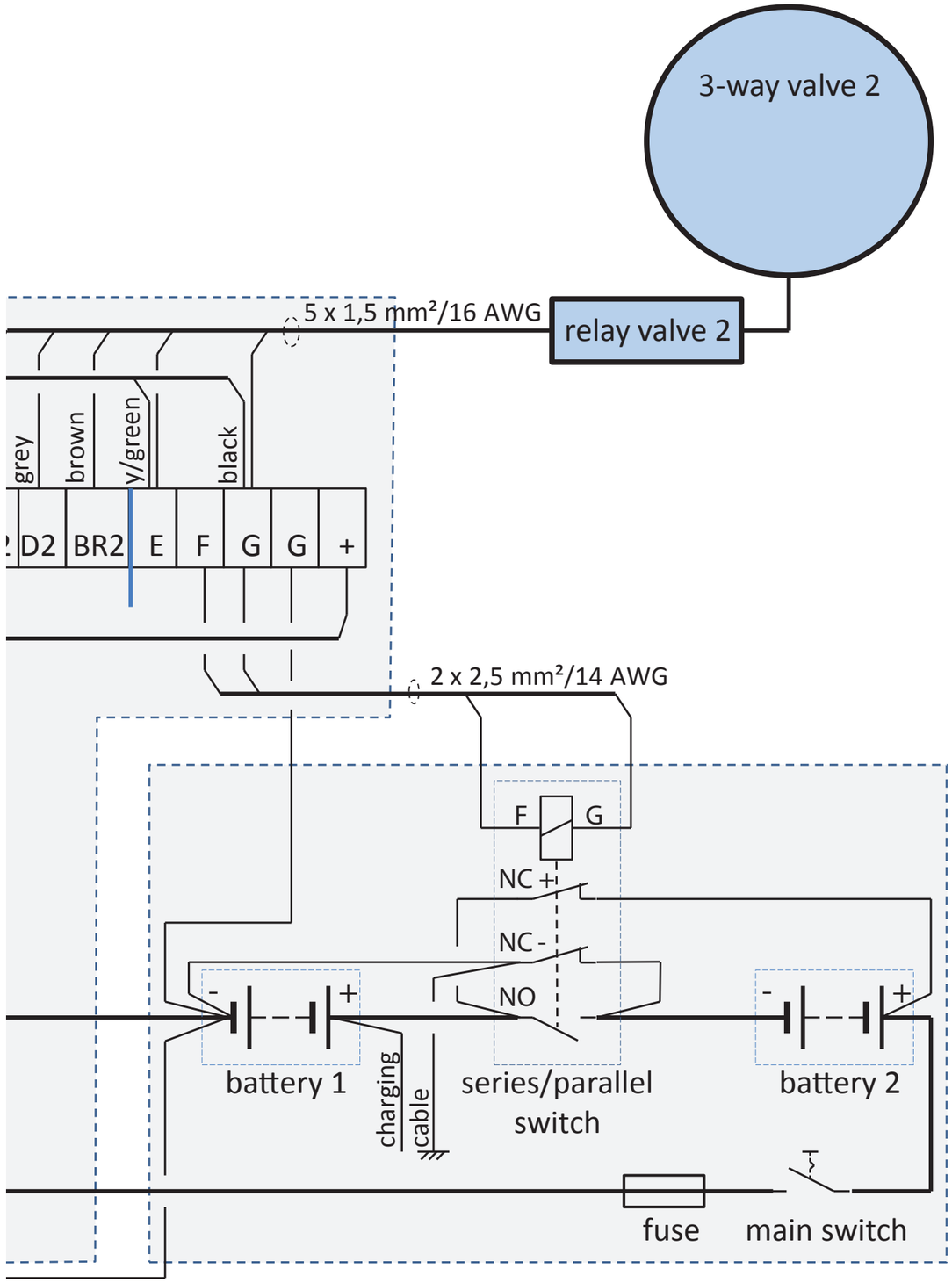
Switch **A** and **B** wires at contactor support if joystick control needs to be reversed.

+ Serie Parallel Switch / Electrical Air valve to: **F**

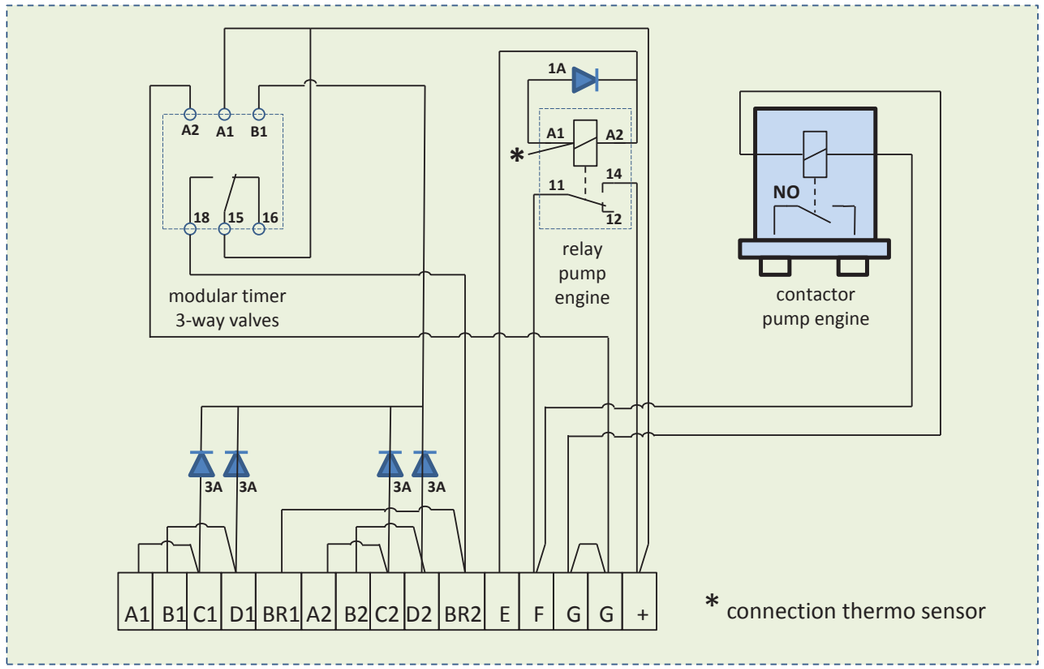
- Serie Parallel Switch / Electrical Air valve to: **G**

Electrical diagram Jet Thruster Combi

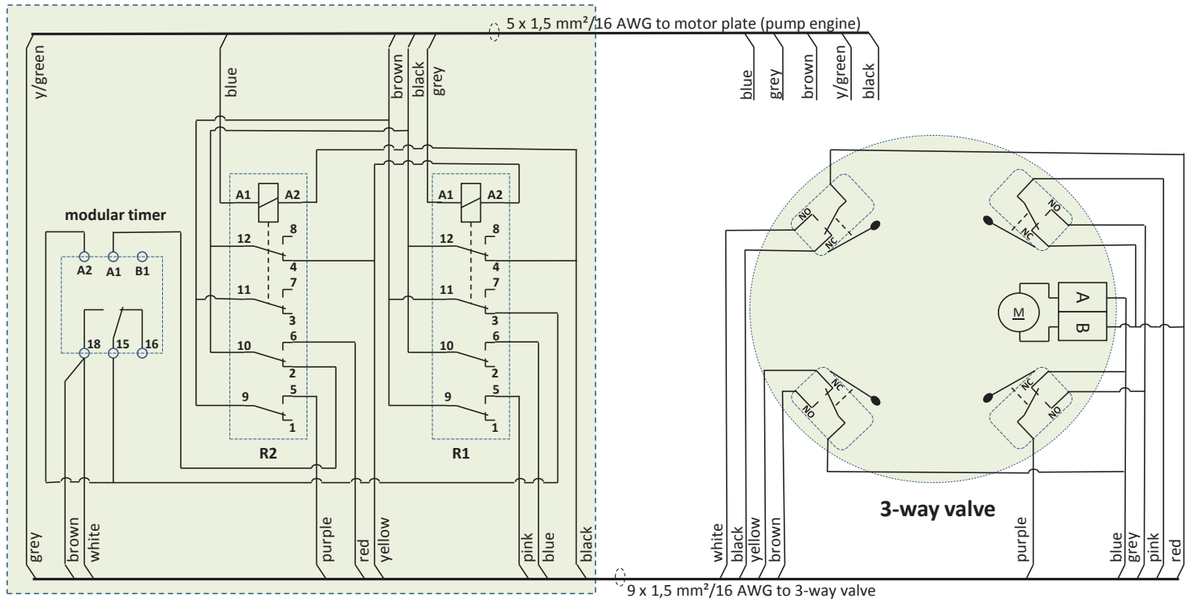




Motor plate (pump engine)
JT-xx Combi



Relay box - 3-way valve
JT-xx Combi



relay box

Modular Timer Present in Valve Relay Box

How to adjust the Valve time relays:

Note: Any valve that closes rapidly at the end of a pipeline will cause fluid hamer. To avoid this fluid hammer in the Jet Thruster Combi system, both valves are equipped with a time relay that keeps the valve open after the operator let go of the joystick. Built up water pressure, and the velocity of the water will be released before the valve will be automatically closed by the system.

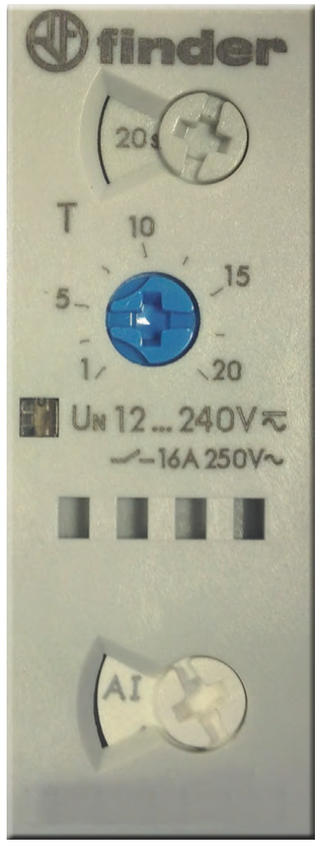
Every Jet Thruster Combi installation is different, and therefore the timer relays **in the valve relay unit** have to be custom adjusted. The factory preset is 2 seconds.

Use a small screwdriver to make adjustments to the time relay that is in the Relay Unit Box which is attached to the Valve.

Note: *there has to be a minimum of 1 second between the bow and stern valve.*

Factory Valve closing delay preset:
One valve 2 seconds, other valve 3 seconds.
If adjustments are made, make sure to extend by increasing the delay for every valve by ONE second accordingly.

Relay unit Valve 1



Do not adjust

Adjust in steps of ONE second

Do not adjust

Note:
Do NOT make adjustments to the similar relay on the pump unit.

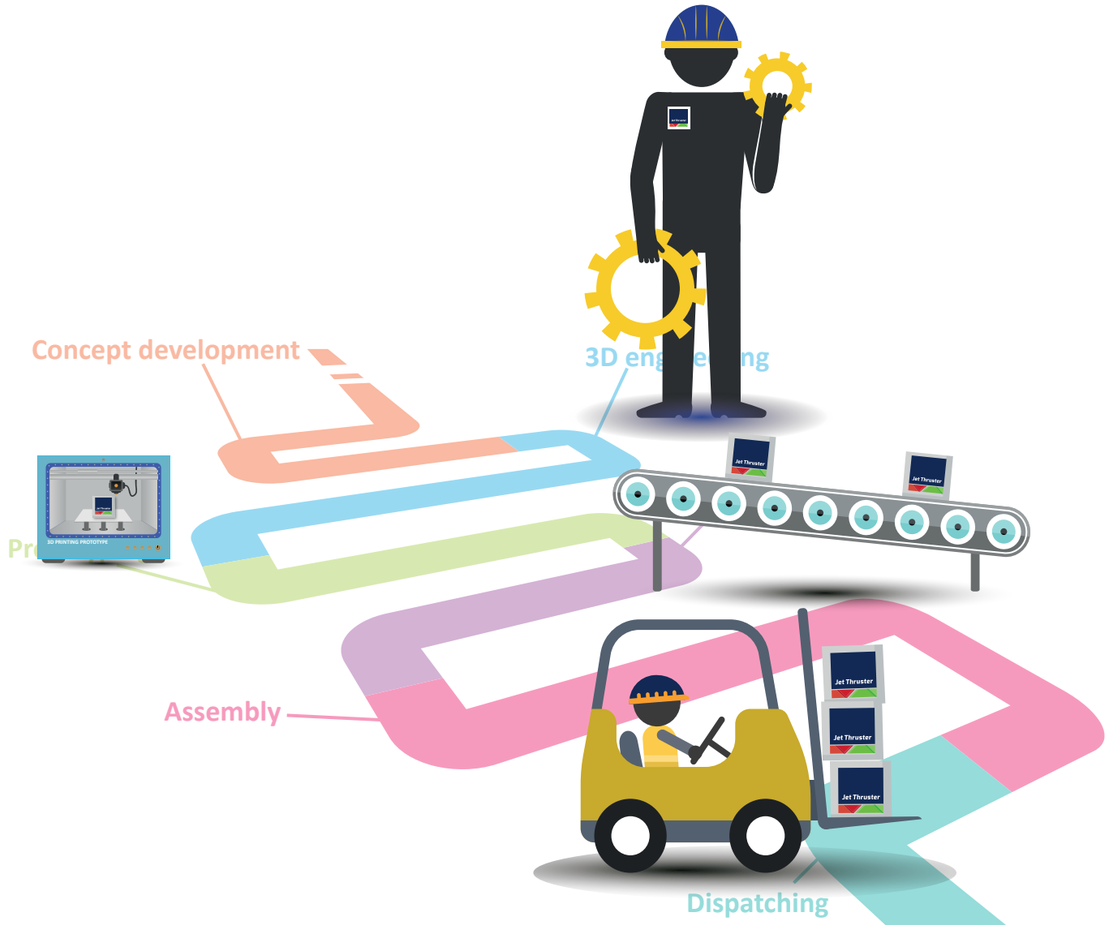
Valve relay unit time relay

Note:
Rapidly changing the thrust force from port to starboard or vice versa will cause fluid hammer in the Jet Thruster Combi system. The possible time to switch thrust to order side without fluid hammer will be different in every installation.
The operator of the Jet Thruster system has to be familiarized with the actual time to switch without hearing the fluid hammer.

When dual operated, (Bow and Stern Thruster at the same time) a fluid hammer can occur if one of the joysticks will be let go, or during the operation one valve is turned in opposite direction. The fluid hammer will be less because the water pressure is divided between bow and stern. The operator has to familiarize himself with this phenomena.

RMA (Return Material Authorization)

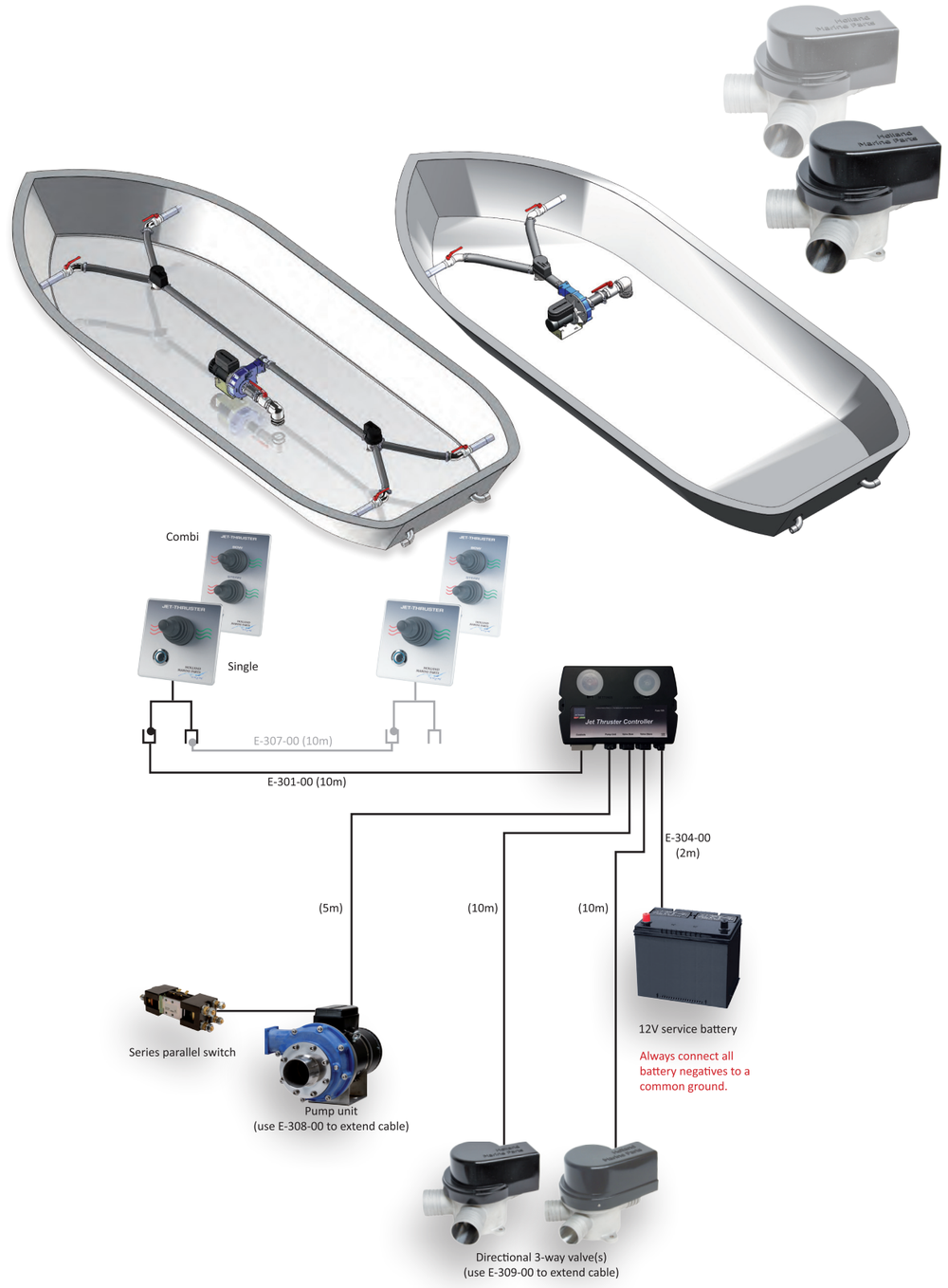
- Take picture of sticker on top of Jet Thruster motor
- Send the picture to: **service@hollandmarineparts.nl**
- You will receive a RMA Form to pack with the part and send back.



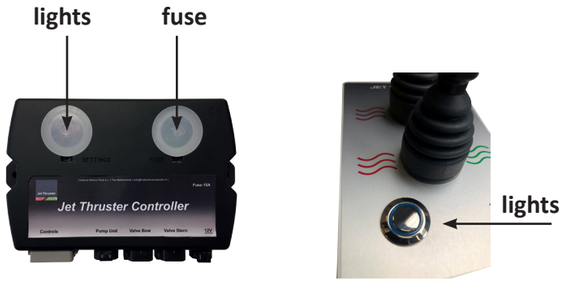
early 2017 - Present

Jet Thruster Models (JT-30-50-70-90)

Including plug & play controller



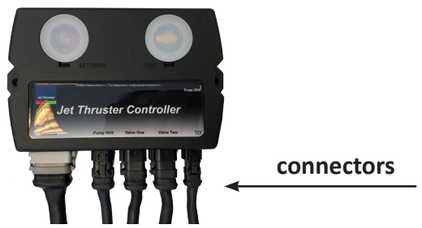
Flashing codes (visible at the blue Joystick/push button helm controls)



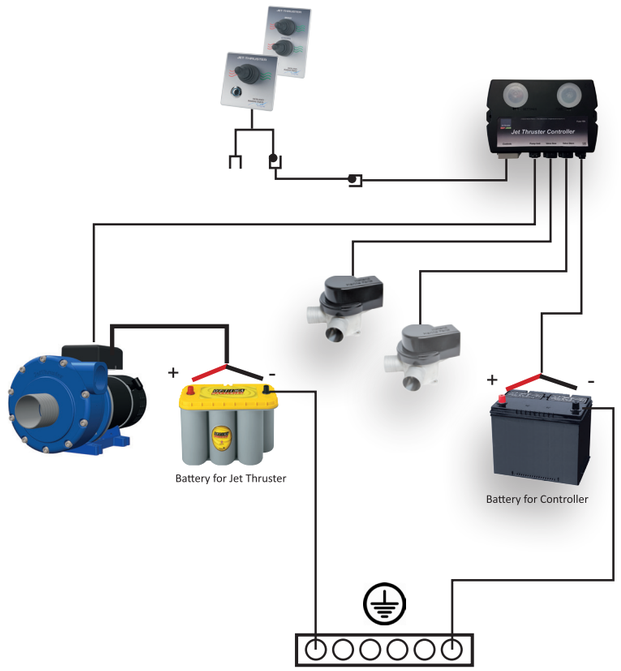
Flashing fast: DC pump motor possible overheated: Let cool down, auto reset

Fast flashing: DC pump motor not overheated or/and in cool condition:

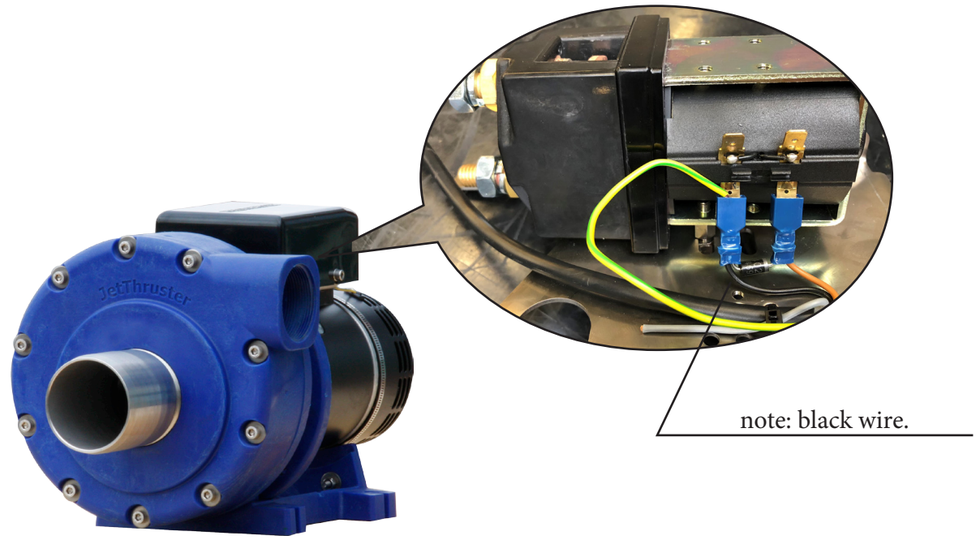
- Check all connectors of the Jet Thruster system: They have to be tightlly clicked in the socket. Take out the plug, and reconnect, listen if you hear it click in well. Check thorougly



- Check for common ground: Jet Thruster battery negative and Service battery negative need a common ground! Otherwise the system will not work.
(can also be founded on page 12 of the installation manual)



- Check function of Thermal-Sensor at pump motor: Does the sensor has a negative and / or is the small white or yellow wire connected: To test and test only: Connect green/yellow cable with black wire. Fast blinking should stop.



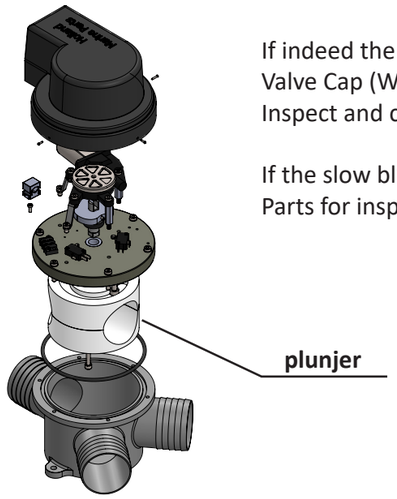
- If fast blinking remains: Send Controller back to Holland Marine Parts for inspection

Slow Blinking (at controller) Blue light at Helm controls

Plunjer present in Directional 3-Way Valve is not returning to mid-position in time. (This should not take longer than 7 seconds)

- U can reset the controller by turning the controller on and off
- Check if all connectors are securely in place, listen for hearable click after you maximum slide in the connectors into the sockets
- In case above mentioned slow flashing of light remains:

Check if plunjer inside valve is turning smooth: Remove plack plastic cover from the Valve Cap: One person must observe, another person must operate the system at the helm controls



If indeed the plunjer is turning very slow: Close all ball valves, remove Valve Cap (Which holds the electrical parts) and remove and the plunger. Inspect and clean pjunjer and valve housing

If the slow blinking remains: Send Controller back to Holland Marine Parts for inspection

Power led at Controller: (Green LED below left transparent cap)

- No green light: Check if power cable has been firmly connected (check Audible click whilst sliding in the connector)
- Check if main-switch of boat is on
- Check fuse at controller: (below right transparent cap) Fuse=20A
- Check voltage at power cable to controller, this should be at least 12V

Troubleshooting:

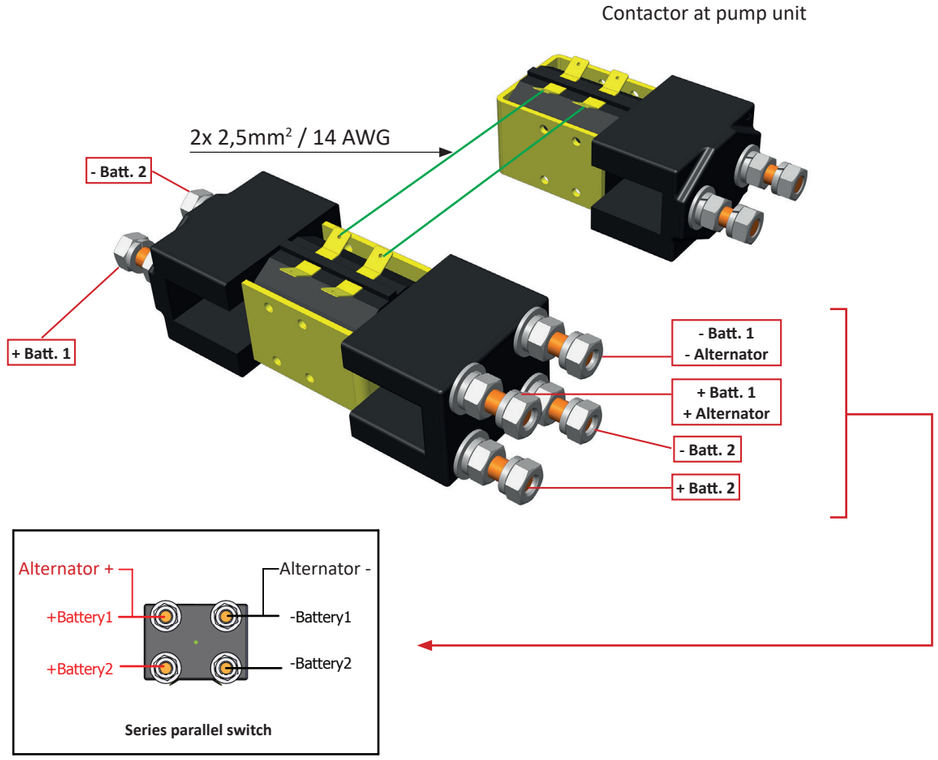
If the system is not functioning:

Problem	Cause	Solution
- Green Led is off	- No Power or defective Fuse.	- Check Controller Battery voltage
- Green Led is off	- No Power or defective Fuse.	- Check if all connectors are tight
- Green Led is off	- No Power or defective Fuse.	- Check - Change the Fuse 20A
- Red Led Flashing fast	- Engine is overheated	- Let the Jet Thruster cool down 20+ min
- Red Led Flashing fast	- There is no common ground cable	- See page 12 for wire schedule
- Red Led Flashing fast	- Thermical sensor is damaged	- email us for solution
- Red Led Flashing fast	- Connector is not tight	- Check if all connectors are tight
- Red Led Flashing slow	- Valve not open or closed in time	- Re-plug the power cable of Controller
- Red Led Flashing slow	- Valve is stuck	- Remove the valve and clean inside
- System is not working	- Battery dead	- Measure battery separately
- System is not working	- Main fuse broken	- Check and replace the main fuse
- System is not working	- wrong dipswitch settings	- Check page 10 for dipswitch setting
- Engine running inverted	- Wrong dipswitch settings	- Check page 10 for dipswitch setting
- Bow and stern wont work	- Wrong dipswitch settings	- Check page 10 for dipswitch setting
- Engine running, no activity	- Engine does not draw water	- Place pump unit inlet below water line
- Engine running, no activity	- Polluted system (shallow water)	- Run engine in deep water until clean
- Engine running, no activity	- Damaged impeller	- Contact your dealer
- System is not efficient enough	- Low battery voltage	- Charge batteries / measure batteries
- Not enough power (JT-50-70-90)	- Series-parallel does not activate,	- Check connections of series switch
- Not enough power (JT-50-70-90)	- system runs at 12V	- Measure if there is 24v on series switch

Series - parallel switch

The Series Parallel Switch creates a temporary 24V environment out of two 12V batteries to power the DC motor from the pump unit.

The switch itself operates at 12V. The moment the Jet Thruster system activates, 12V power activates the coil that makes the switch connects the battery cables. Automatically the connection will break if the Jet Thruster stops running.

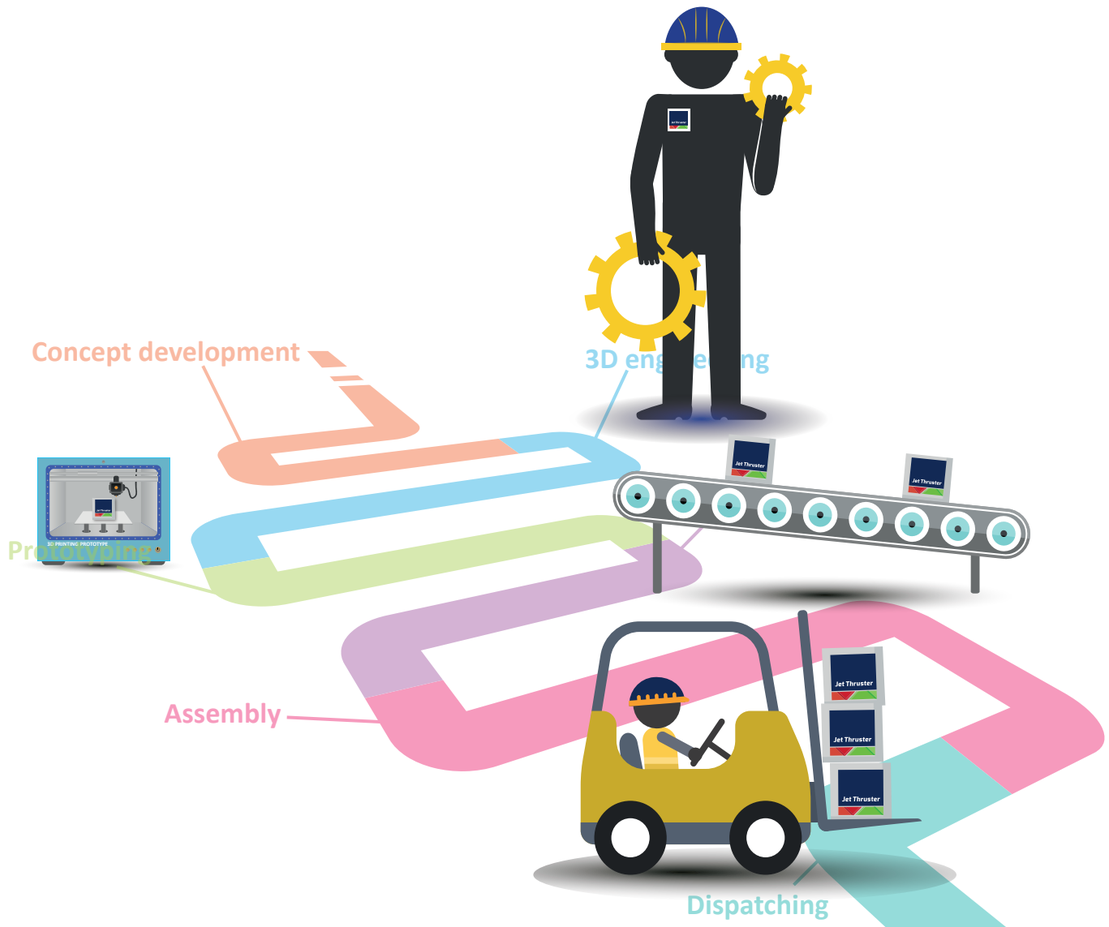


Series parallel switch

Note if the Series Parallel Switch does not work!!
The Jet Thruster will run at 12V.
This implicates that less thruster force will be provided by the pump unit.

RMA (Return Material Authorization)

- Take picture of sticker on top of Jet Thruster motor
- Send the picture to: **service@hollandmarineparts.nl**
- You will receive a RMA Form to pack with the part and send back.



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HISWA

All our products are manufactured according to CE regulations.
We keep the rights to change descriptions, graphs or statements,
which are required for technical development of our Jet Thruster systems.