Report on New Design of Water Dispenser *(KWD-BLC2088B)*

- To conduct testing and evaluation of the new water dispenser design in order to determine its compliance with the company's standards for functionality, safety, reliability, and overall performance.

WARM WATER TEMPERATURE

A test was conducted to determine whether the water dispenser dispenses water within the acceptable temperature and volume range. The test procedure was carried out as follows:

CONTINUOUS DISPENSING TEST

- Plug in the water dispenser.
- Switch ON all buttons (Power, Cold, Hot).
- Wait until both heating and cooling cycles are complete.
- Dispense and measure:
  - Warm Water: Pour 350 mL × 5 times, record the temperature for each pour.
  - Hot Water: Pour 350 mL × 5 times, record the temperature for each pour.
  - Cold Water: Pour 350 mL × 5 times, record the temperature for each pour.

Test Result for CURRENT WATER FLOW DESIGN

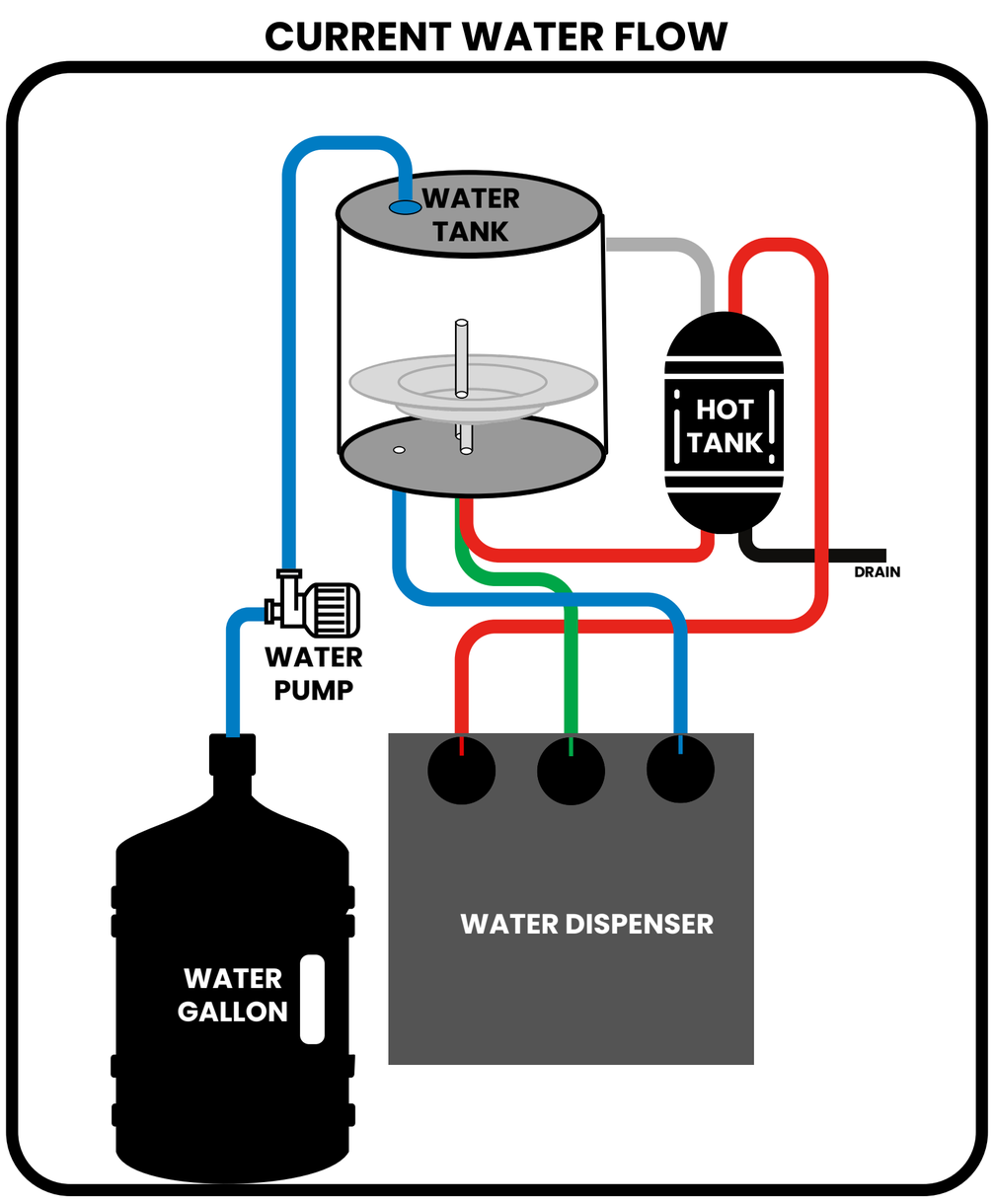
WARM WATER			
	Trial 1	Trial 2	Trial 3
1st Pour (350 mL)	24.4	20.7	23.1
2nd Pour (350 mL)	19.3	17.6	21.2
3rd Pour (350 mL	19	18.4	21.1
4th Pour (350 mL)	19.8	19.4	20.8
5th Pour (350 mL)	20.1	19.9	21.1

COLD WATER			
	Trial 1	Trial 2	Trial 3
1st Pour (350 mL)	8.1	11.4	10.9
2nd Pour (350 mL)	10.3	12.7	13.1
3rd Pour (350 mL	13.5	18.3	18.4
4th Pour (350 mL)	17.6	22.3	22.5
5th Pour (350 mL)	20.5	22.6	22.8

HOT WATER			
	Trial 1	Trial 2	Trial 3
1st Pour (350 mL)	78.9	74.5	76.1
2nd Pour (350 mL)	56.5	60.2	58.1
3rd Pour (350 mL	49.5	40.4	45.2
4th Pour (350 mL)	46.5	38.1	42.1
5th Pour (350 mL)	44.0	36.1	39.5

Note: Temperatures were recorded in 5 pours with at least 20 seconds interval.

CURRENT WATER FLOW



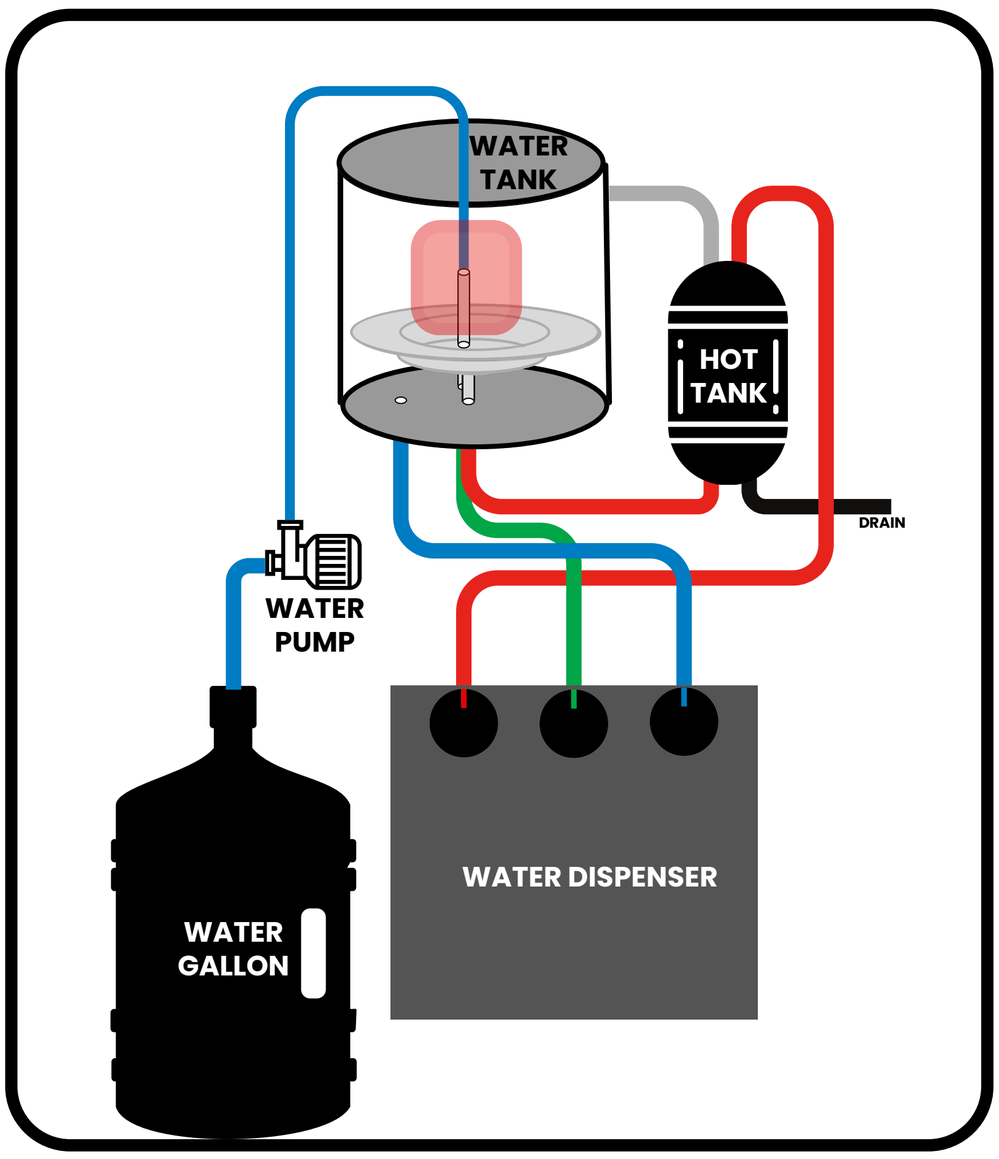
OBSERVATIONS:

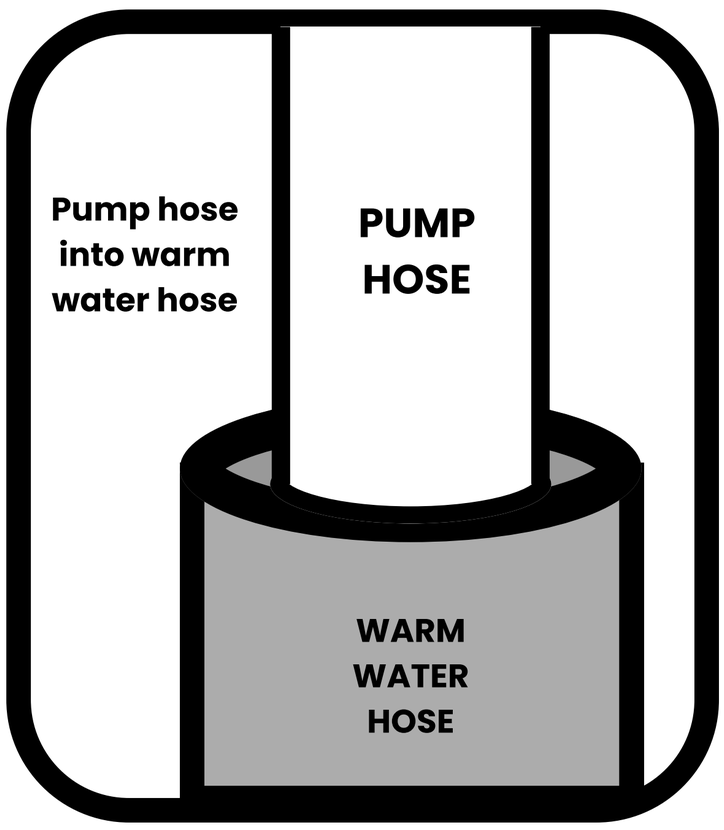
- **WARM WATER TEMPERATURE BELOW EXPECTED LEVEL**
  Warm water should typically be within ***above 23°C***. However, the measured temperatures—especially after the second pour—were observed to be too cold to be considered warm water. This may be caused by newly pumped water mixing with the cold water supply, affecting the expected warm water temperature.

ACTION TAKEN / PROPOSED SOLUTION:

To address the issue of the warm water temperature falling below the expected level, our Research and Development team proposed ***repositioning the pump hose inside the tank to connect directly with the warm water hose***. Previously, the strong water flow from the pump entered the tank and mixed with the cold water, which resulted in lower-than-expected warm water temperatures. This adjustment is expected to mitigate the strong water flow and minimize mixing with the cold water.

PROPOSED WATER FLOW





- A ***slight loose connection*** was maintained to ensure that the cold water tank continues to receive water supply. At the same time, the pump was reconfigured to direct water flow directly to the warm water line when needed.

- This adjustment ensures that the cold water system remains functional while also maintaining the expected warm water temperature during dispensing.

Test Result for PROPOSED WATER FLOW DESIGN

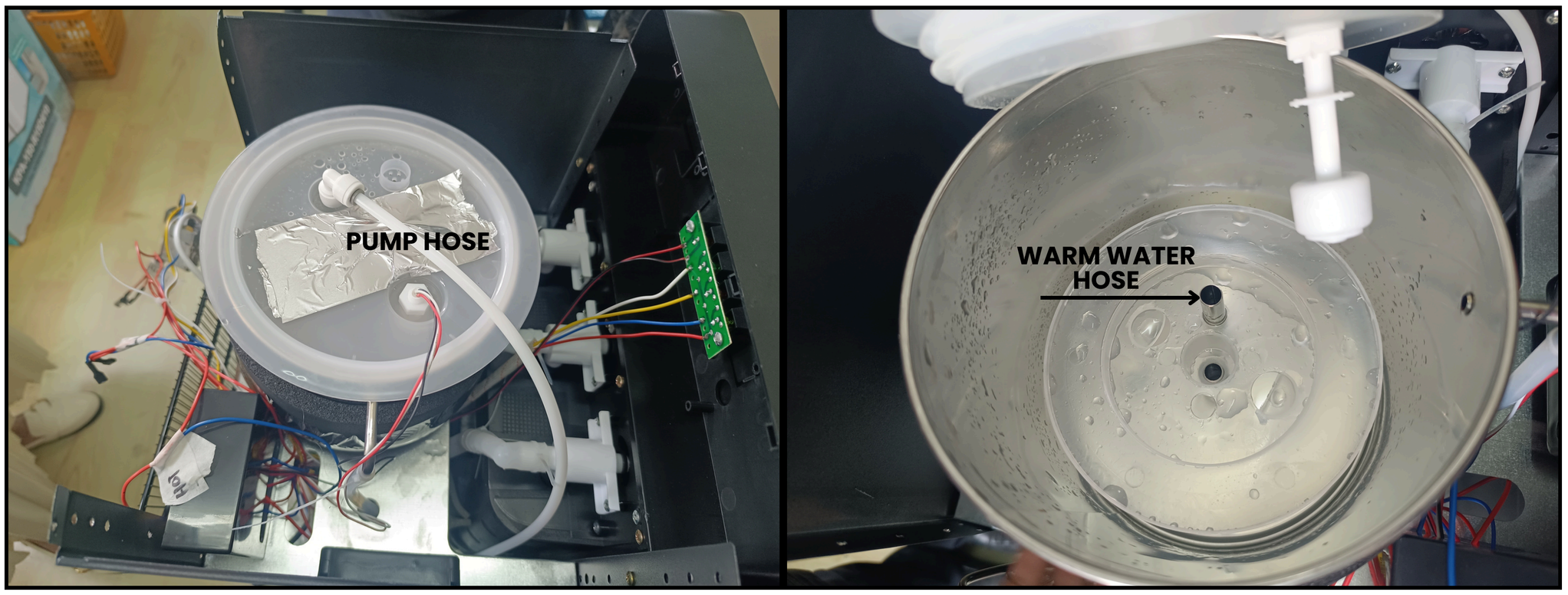
WARM WATER			
	Trial 1	Trial 2	Trial 3
1st Pour (350 mL)	23.6	24.7	23.7
2nd Pour (350 mL)	23.3	23.1	25.6
3rd Pour (350 mL	23.3	23.2	24.7
4th Pour (350 mL)	25.3	23.7	26.1
5th Pour (350 mL)	25.5	23.2	25.6

COLD WATER			
	Trial 1	Trial 2	Trial 3
1st Pour (350 mL)	12	12.7	8.8
2nd Pour (350 mL)	12	13.5	13.4
3rd Pour (350 mL	15.3	17.6	18
4th Pour (350 mL)	19	21.2	22.2
5th Pour (350 mL)	21.9	22.7	24.1

HOT WATER			
	Trial 1	Trial 2	Trial 3
1st Pour (350 mL)	77.2	79.5	82.1
2nd Pour (350 mL)	58.2	63.2	65.5
3rd Pour (350 mL	49.2	52.4	53.4
4th Pour (350 mL)	49	49.1	50.1
5th Pour (350 mL)	48.8	44.5	45.6

- Compared with the results from the current water flow design, where the warm water temperature was recorded below 23°C, the proposed changes yielded much better results, with the **warm water temperature** rising **above 23°C**, which is considered **acceptable**.

CURRENT PUMP HOSE POSITIONING
(ACTUAL PICTURE)



PROPOSED PUMP HOSE POSITIONING
(ACTUAL PICTURE)

POWER SWITCH - COLD SWITCH

OBSERVATION:

- **WHEN THE POWER BUTTON IS OFF, THE COLD BUTTON CAN STILL BE TURNED ON**

  It was observed that when the Power Switch Button is set to OFF, but the Cold Switch Button is set to ON, the compressor still activates. This behavior was confirmed through repeated testing. The compressor continues to switch ON even though the main power switch is turned OFF and no water pump is operating.

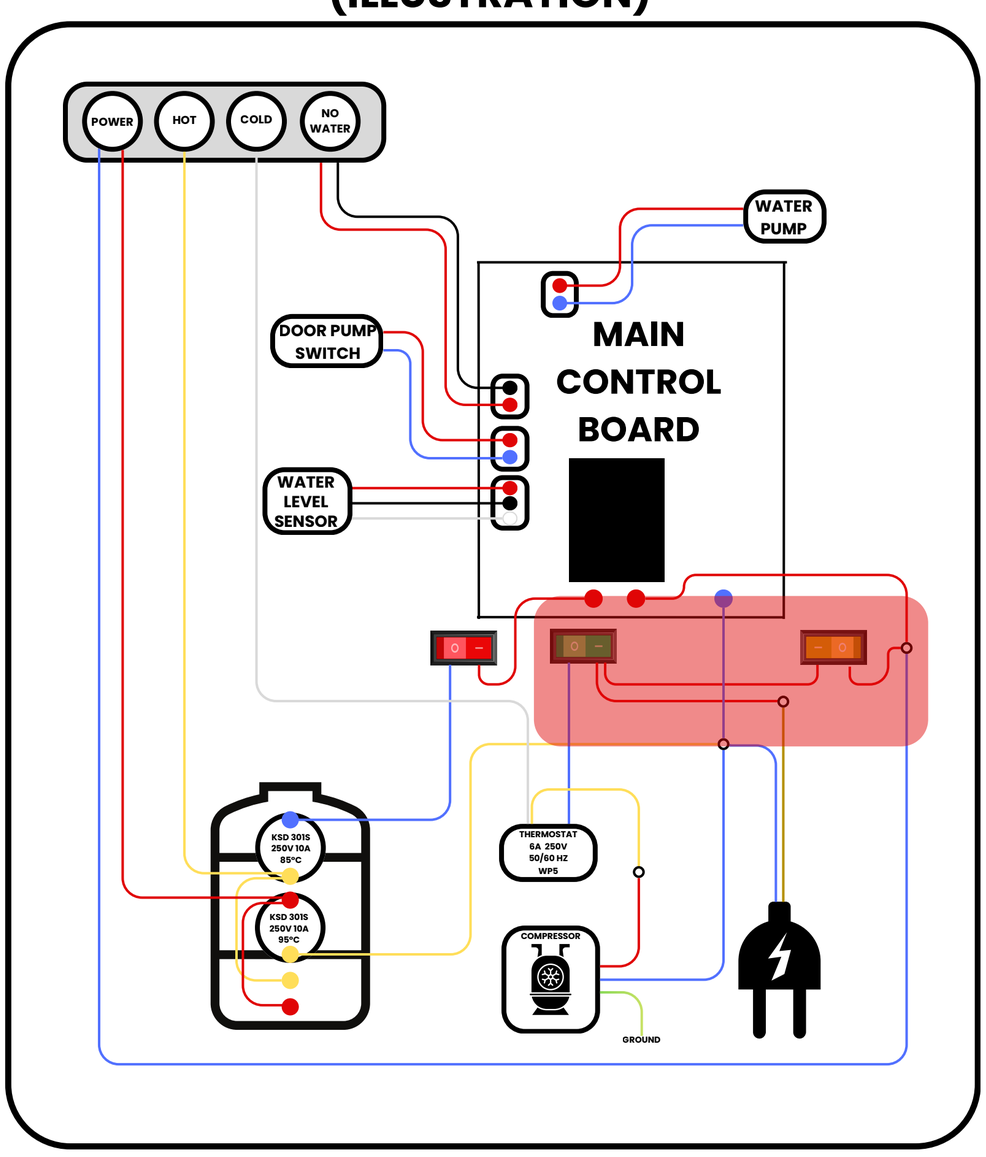
  The design poses potential risks such as unnecessary power consumption, user safety concerns, and possible user confusion due to unexpected operation.

POWER - OFF / HOT - OFF / COLD - ON						
	Power (W)	Current (A)	Temperature (C)			Ambient Temp
			Hot	Warm	Cold	
Trial 1	99.10	0.560	29.2	21.6	13.0	26.1
Trial 2	87.35	0.540	27.9	25.8	12.7	27.2
Trial 3	88.10	0.538	28.3	21.4	13.7	25.9
Trial 4	87.60	0.533	28.5	21.7	13.5	26.3
Trial 5	84.33	0.521	26.9	22.3	12.5	26.3
Average	**89.296**	**0.5384**	**28.16**	**22.56**	**13.08**	**26.36**

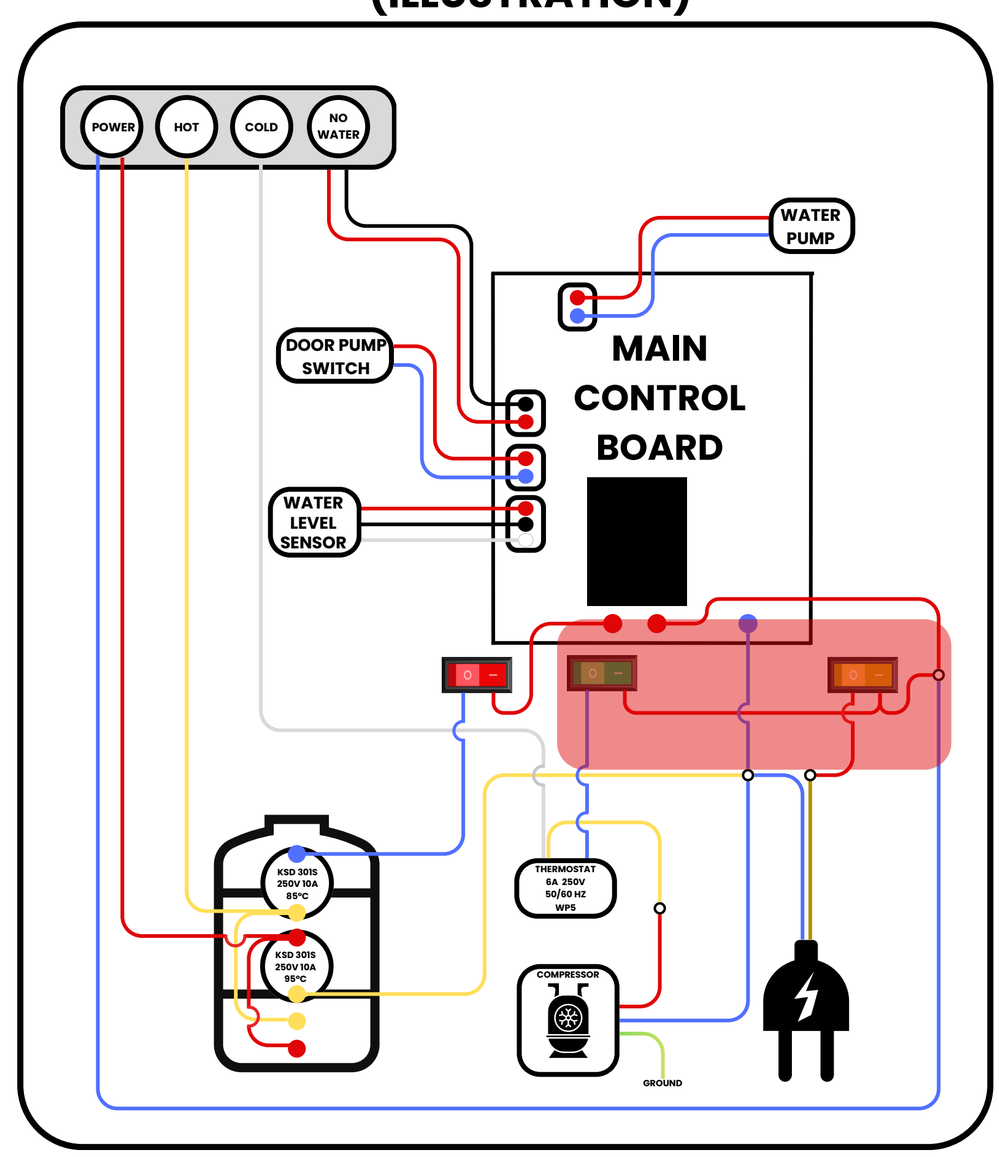
PROPOSED SOLUTION:

- The Research and Development (R&D) team reconfigured the circuit diagram so that the ***Cold Switch is automatically disabled when the Power Switch is OFF***. With this modification, the Cold Switch will not activate even if it is switched ON while the Power Switch remains OFF.
- This change ensures that the Cold Switch operates only when the main Power Switch is ON, aligning the system with proper safety and functional design standards while reducing potential risks.

CURRENT (ILLUSTRATION)



PROPOSED (ILLUSTRATION)

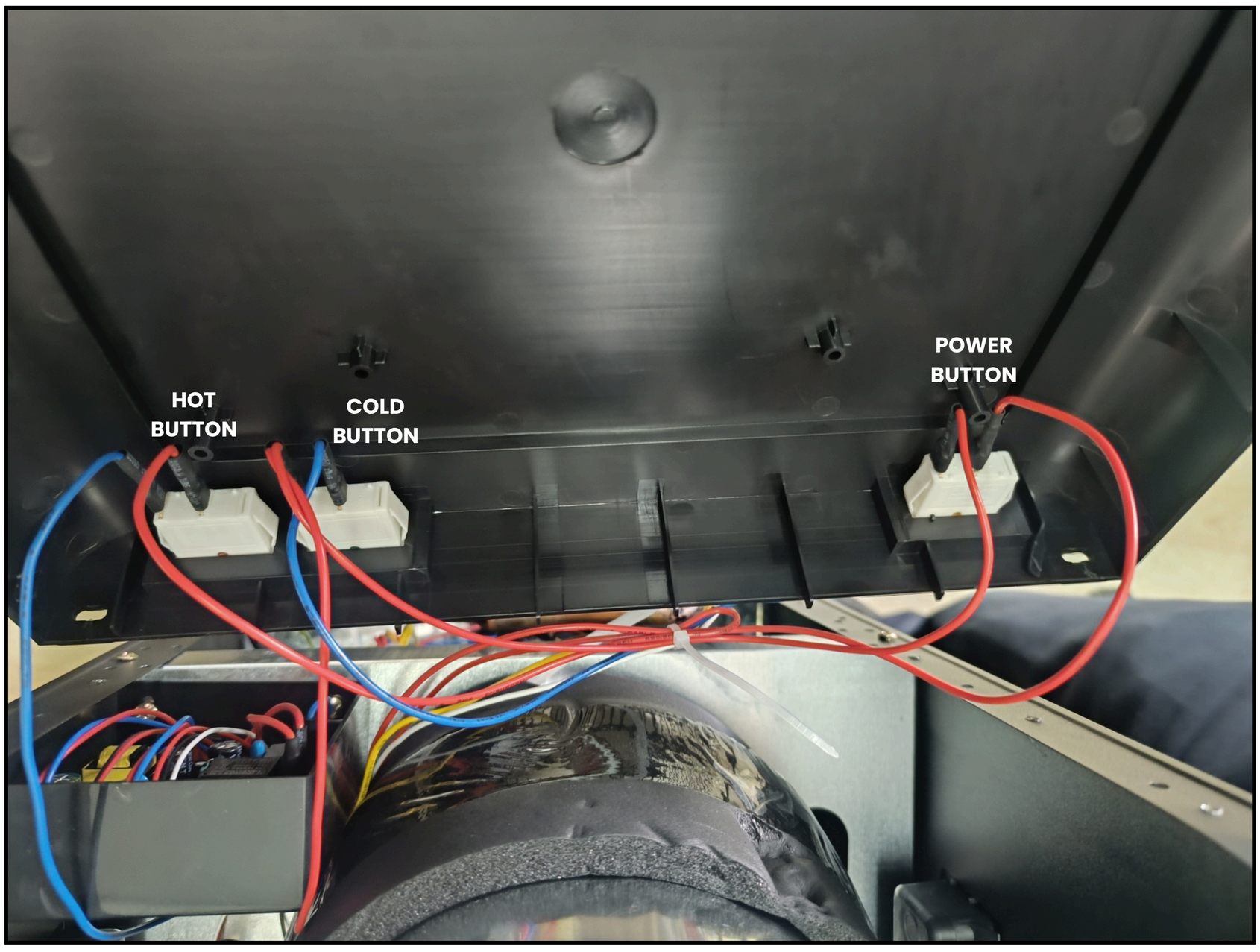


Changes on Proposed Wiring of Water Dispenser compared to Current

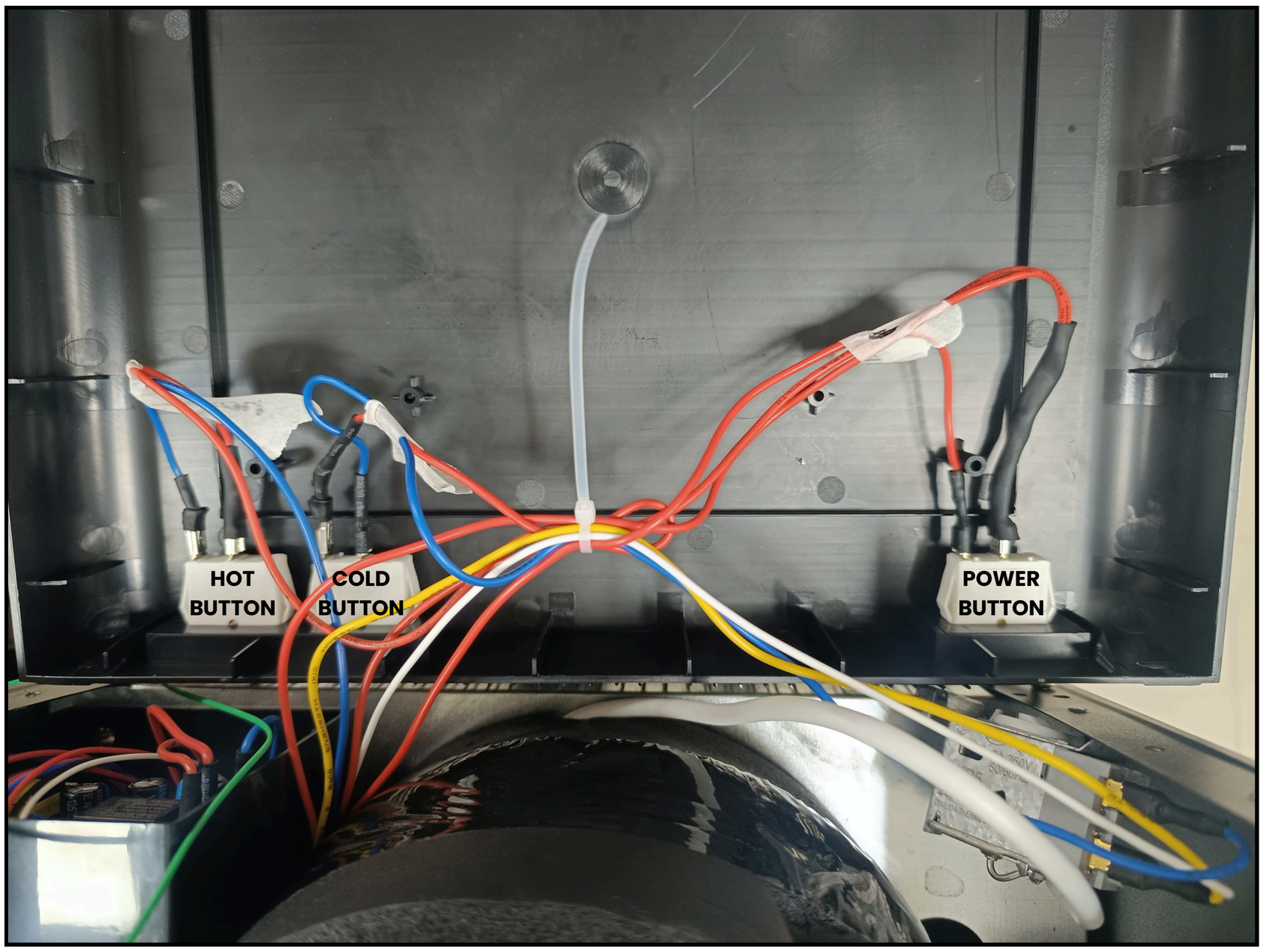
The AC Line is now directed to the Power Button Instead of the Cold button

The Cold Button is now connected through the Power Button, ensuring it only operates when the Power Button is switched ON.

CURRENT WIRING (ACTUAL PICTURE)



PROPOSED WIRING (ACTUAL PICTURE)



INLINE FUSE

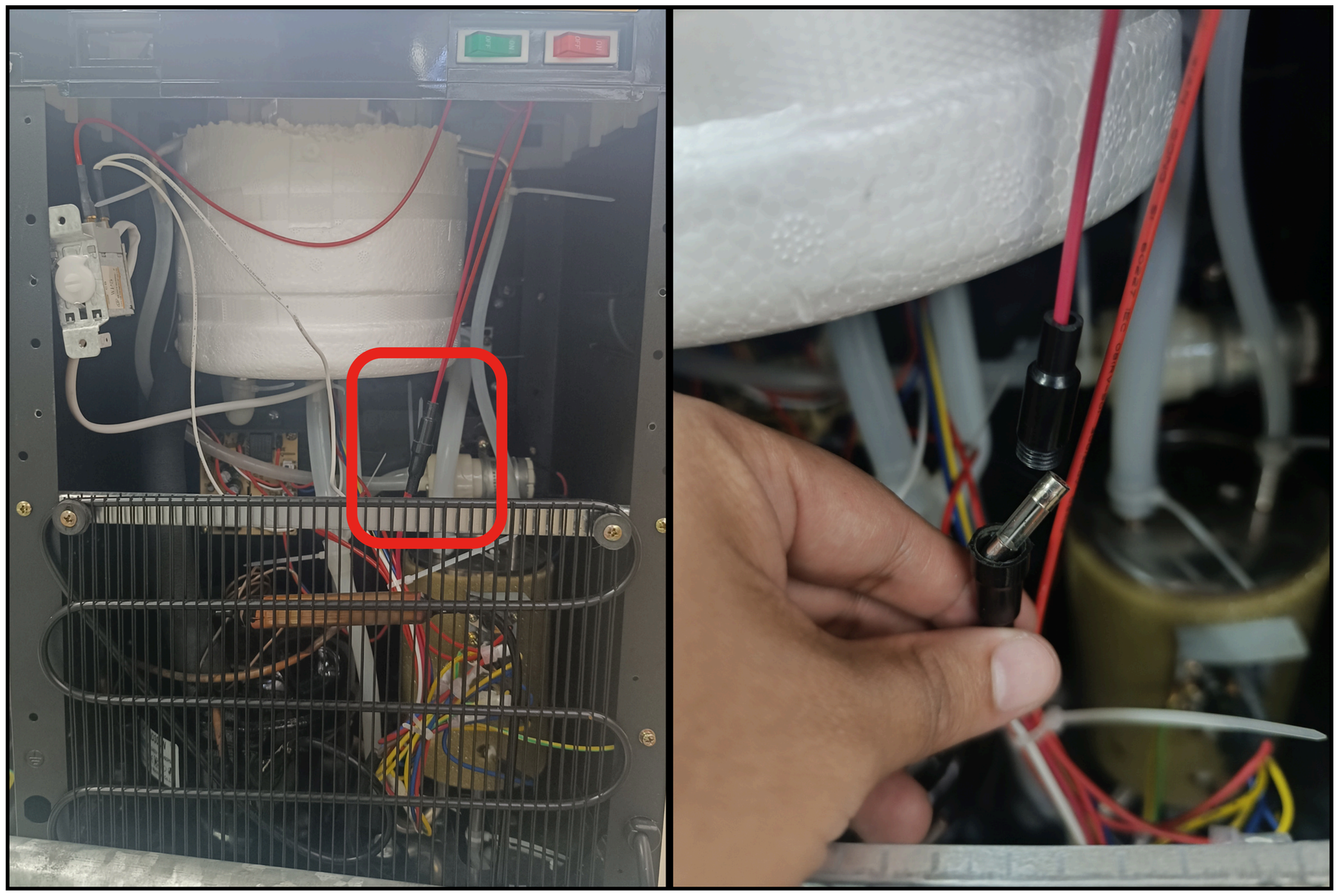
OBSERVATION:

- **PREVIOUS WATER DISPENSER VERSION HAVE INLINE FUSE, THIS VERSION DO NOT HAVE ONE**

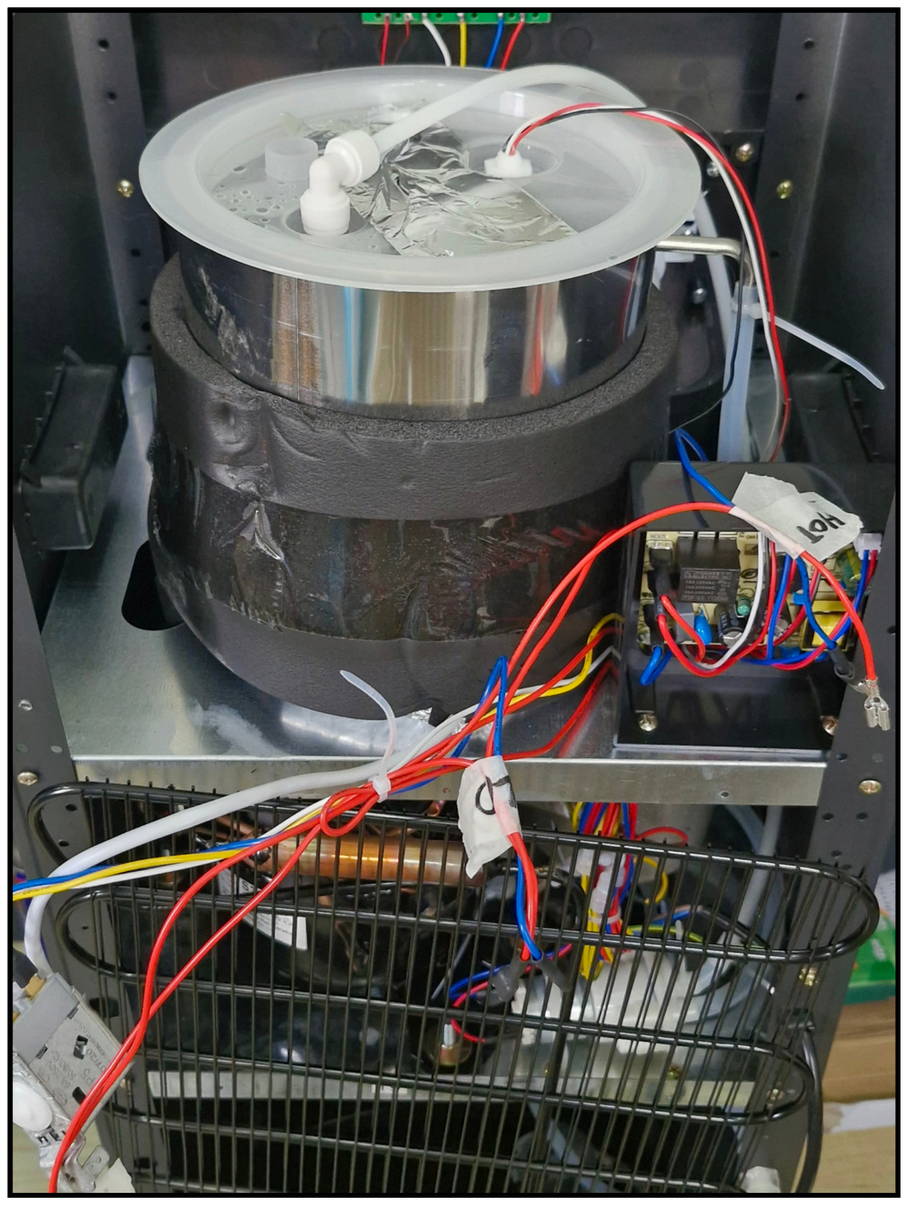
  It was also observed that this version of the water dispenser **does not have an inline fuse**, whereas previous versions were equipped with one.

  The absence of an inline fuse may reduce protection against overcurrent conditions, potentially increasing the risk of component damage or safety hazards.

PREVIOUS DESIGN WATER DISPENSER



CURRENT DESIGN WATER DISPENSER



NO INLINE FUSE

SUMMARY

Observation

1. ***Warm Water Temperature Below Standard*** – Warm water dispensed below the expected 23 °C, mainly due to mixing with cold water inside the tank.
2. ***Cold Button Activation Issue*** – The cold function still operated even when the main power switch was OFF, creating a safety and functionality concern.
3. ***No Inline Fuse*** – The new water dispenser design was observed to have no inline fuse, unlike the previous design which included one.

Action/Recommendation

1. ***Pump Hose Adjustment*** – Repositioned the pump hose to connect with the warm water hose, ensuring warm water flow is maintained without mixing with cold water.
2. ***Circuit Reconfiguration*** – Modified wiring so the cold switch only works when the main power switch is ON.
3. ***Inclusion of Inline Fuse*** – If no other overcurrent protection is provided in the water dispenser, an inline fuse should be included to ensure safety.

Result

1. ***Improved Warm Water Output*** – Continuous dispensing test showed warm water temperature remained above 23 °C, which should be acceptable.
2. ***Cold switch disabled when power is OFF*** - Cold switch can no longer be activated when the power switch is OFF.
3. ***Safe Against Overcurrent*** – The inclusion of an inline fuse enhances the water dispenser's protection and overall safety against overcurrent.

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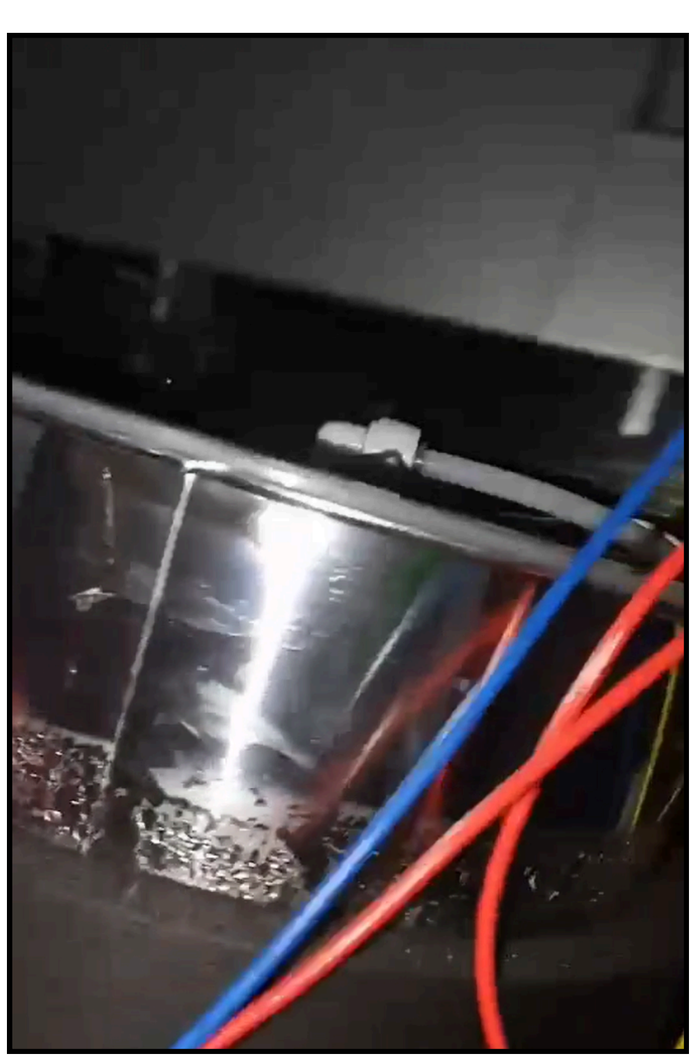
Additional Report on New Design of Water Dispenser *(KWD-BLC2088B)*

MOISTURE ON COLD WATER TANK

- A customer reported a water leak on their water dispenser. Upon inspection by our technicians, it was found that moisture had built up around the cold water tank and the surrounding foam insulation. This moisture accumulation caused water to spread to other parts of the dispenser, including critical areas such as electrical wiring and electronic components.
- Although no damaged parts have been recorded so far, this issue poses a potential risk to the overall performance and safety of the water dispenser if not addressed promptly.





- Though not yet tested on its efficiency, it is worth noting that in a previous design of the water dispenser, both foam insulation and styrofoam were used to surround the cold water tank.