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Calibration

# Fluke Calibration Web Seminar Series

Principles and practical tips about electrical, flow, pressure, RF and temperature calibration

## Tips for Maintaining Temperature Calibration Equipment

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- Fluke Calibration
  - Electrical (Everett, WA)
  - RF (Norwich UK)
  - Temperature (American Fork, UT)
  - Pressure/Flow (Phoenix, AZ)

Fluke Calibration, Temperature, American Fork, UT

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  - Technical Support Engineer
  - Located In American Fork, Utah

- With Fluke/Hart 12 years
  - Customer Service
  - Technical Support

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# Tips for Maintaining Temperature Calibration Equipment

You've invested a lot of money in your temperature calibration lab. Preventative maintenance is critical to keeping your calibration baths and temperature calibrators running at their best. A few minutes spent now in maintaining your equipment can also save you costly repairs and downtime later.

Join this free Fluke Calibration Web Seminar to learn tips for keeping your calibration baths and temperature calibrators operating at their peak.

# Agenda

Maintenance Tips:

- Calibration Baths
- Drywells
- Micro-Baths

# Why maintain your calibration bath?

- Extend the life of the unit
- Better measurements
- Prevent “down time”

# Bath maintenance tips

1. Clean the bath exterior
2. Clean the condensing coil
3. Replace the controller battery
4. Check the over-temperature cutout
5. Select the right bath fluid
6. Insure proper ventilation
7. Avoid silicone oil polymerization
8. Use a bath cleaning solvent

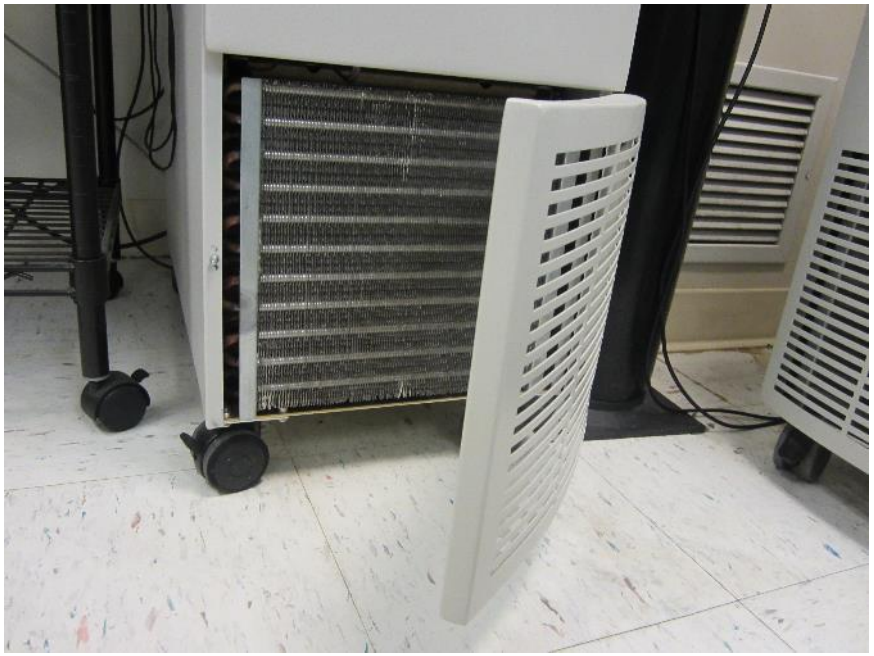
# 1. Clean the bath exterior

- Spray cleaner directly onto a cloth or paper towel
- We recommend using ethanol or OS2 solvent for silicone clean-up
- Wipe away all silicon oil from the top of the unit
- Clean-up condensation around cold bath access
- Periodically remove the top cover of the bath and wipe out oil around the outside of the gasket

# 2. Clean the condensing coil

Locate the condensing coil access door

**Note not all units have this door and may require you remove the panel



# 2. Clean the condensing coil

- Set a schedule for cleaning the condensing coil fins
- Use low pressure compressed air directed at a downward angle to remove lint and dust build-up on the condensing coil fins
- Frequency of cleanly depends upon your laboratory environment

➢ For instructions regarding your specific model, contact Technical Support

# 2. Clean the condensing coil

Using a low pressure air source, blow any dust or debris off.

Be sure to blow from the top down.


If the fins of the condensing coil are bent, they can be straightened using a fin comb.

# 3. Replace the controller battery

- Symptoms
  - The controller initializes during boot up and/or will not keep the parameters stored in memory
  - The unit does not control properly
- Changing it out

Remove the four screws that hold the panel

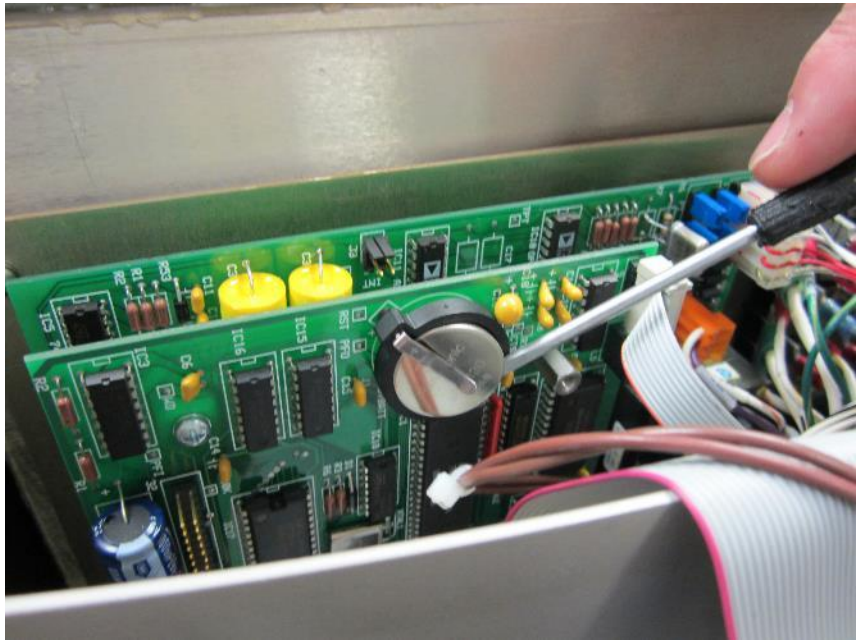
# 3. Replace the controller battery

Once the screws are removed, let the display hang so you have access to the controller

The battery should be visible

# 3. Replace the controller battery

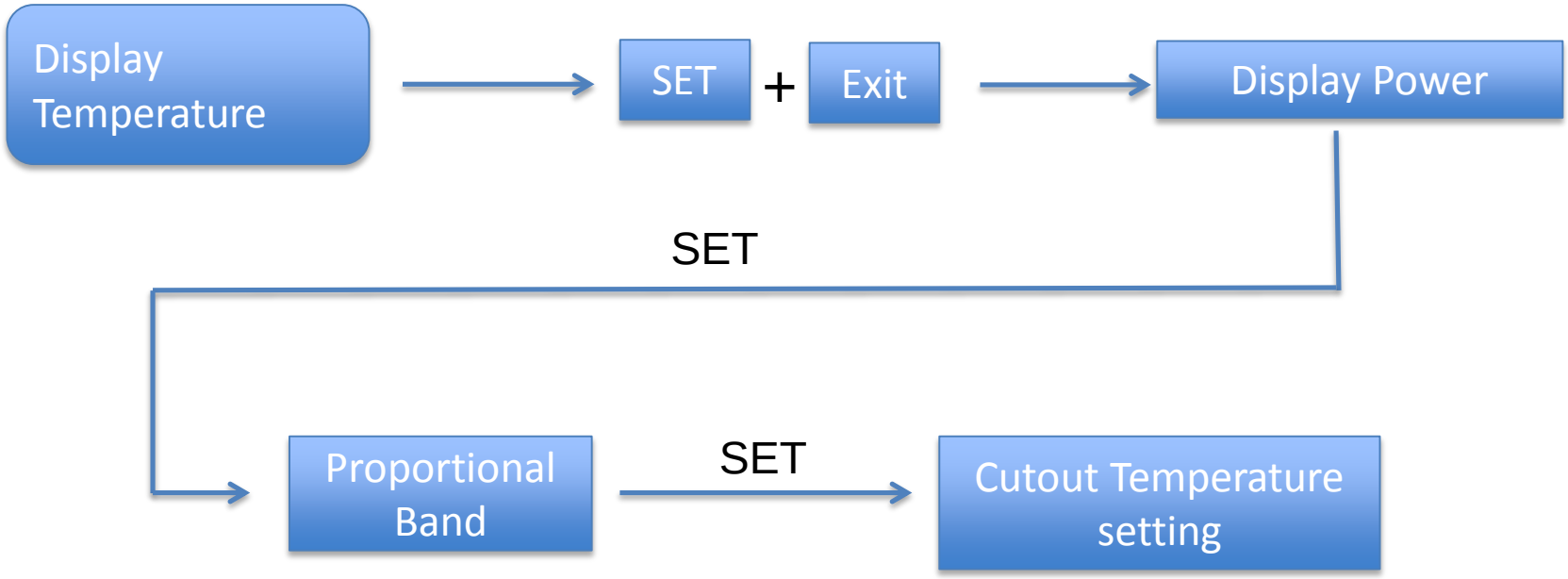
Use a flat head screw driver to pull the battery out.



- The battery level must be above 2.8V
- At 2.7V the battery does not have enough power to maintain the memory
- New batteries should be around 3.3V to sustain the operation.
- Typical life span is 7 to 8 years

# 4. Check the over-temperature cutout

- The over-temperature cutout should be tested every 6 months
- The cutout is checked through the display panel using the sequence below:



# 4. Check the over-temperature cutout

- Set the cutout to a temperature that is within the range of the fluid you are using

Exceeding the temperature limits of the bath fluid could cause harm to the operator, lab, and/or instrument.

- Set the unit to temperature higher than the cutout
- When the unit reaches the cutout set-point the display will flash “cut-out” and the power to the heaters will be cut.

# 5. Select the right bath fluid

**Bath fluid types**

- Halocarbon
- Alcohol
- Dynalene HF/LO
- Ethylene Glycol
- Bath Salt
- Mineral Oil
- Silicone Oil

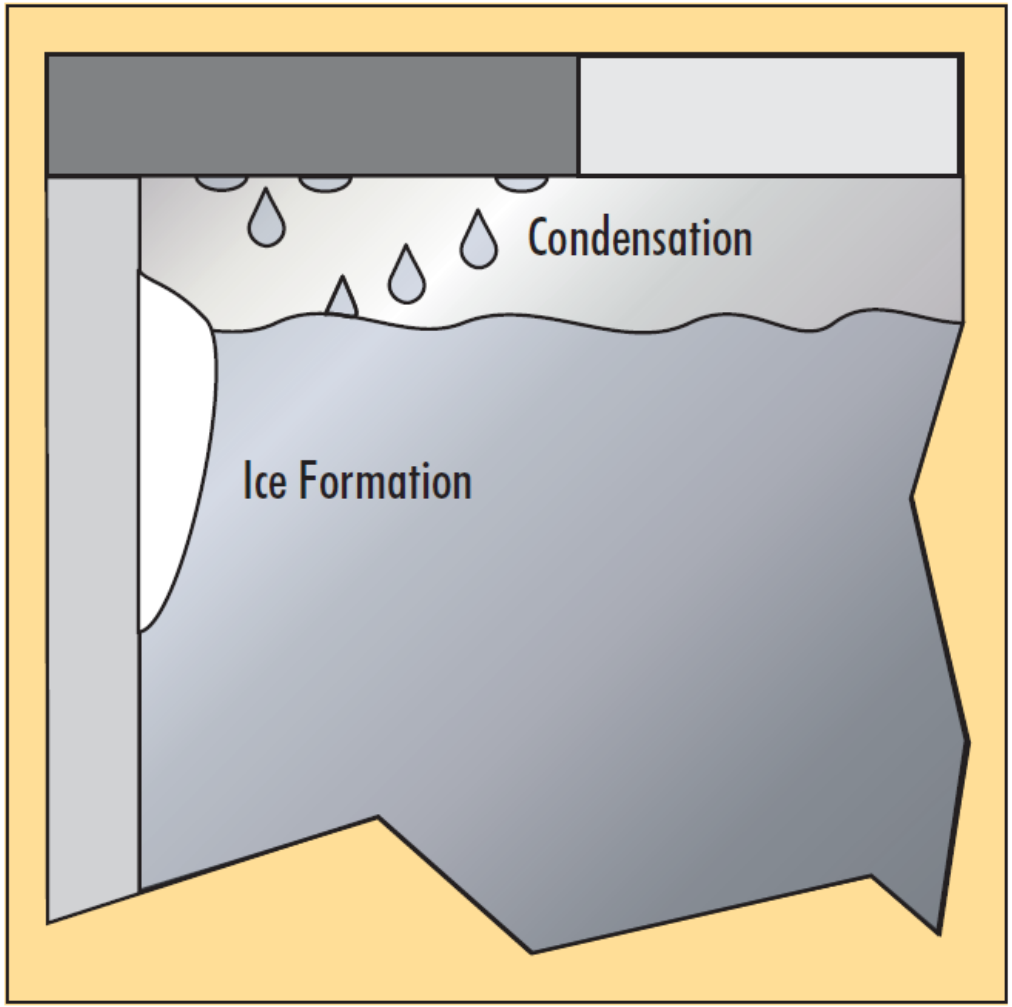
For more information, consult our “How to Select a Calibration Bath Fluid” guide

http://us.flukecal.com/literature/articles-and-education/temperature-calibration/application-notes/how-select-calibration-b

# Water build up in your fluid

- Water build up occurs at lower temperatures.
- Water can change the viscosity of your fluid.
- Ice build up can reduce the cooling capacity of the unit.

- What to do if water build occurs?



# 6. Insure proper ventilation

- 500 - 600 CFM Fan
- 4”-6” flex Pipe
- If you have a main air duct, the oil will accumulate over time
- Include an access or drain valve so accumulated oil may be removed

# 7. Avoid silicon oil polymerization

- Polymerization is the bonding of molecules to form long chains.
- This causes the fluid to become gel like


# 7. Avoid silicon oil polymerization

| Time to Polymerize at Temperature | | | | |
|---|---|---|---|---|
| **Silicon Oil Type** | **Fluke Model #** | **200°C** | **250°C** | **300°C** |
| DC 550 | 5010 | >2500 hrs. | 1200 hrs. | N/A * |
| SH 200/100 | 5012 | 360 hrs. | 120 hrs. | <24 hrs. |
| SH 510/1000 | 5014 | >4,000 hrs. | 2880 hrs. | 96 hrs. |
| SH 710/500 | 5017 | >5,000 hrs. | 3,000 hrs. | 480 hrs. |

40g sample in a beaker with 19.35 cm2 surface area

* N/A – exceeds flash point of the fluid

# 8. Use a bath cleaning solvent

- Dow Corning OS-2 solvent
- Evaporates completely
- Softens cured silicon, allowing easier removal
- Odorless

# Why maintain your drywell?

- Extend the life of  the unit
- Better measurements over time
- Prevent “down time”
- Prevent seized inserts

# Drywell maintenance tips

1. Clean the drywell exterior
2. Clean the finger guard at the bottom of the unit
3. Maintain the wells
4. Check the over-temperature cutout

# 1. Clean the drywell exterior

- Wipe with a cloth or towel
- Spray the cleaner onto cloth or towel not directly on unit
- Ethanol is recommended
- But common cleaners can be used (e.g. 409, Windex, Simple Green)

# 2. Maintain the wells

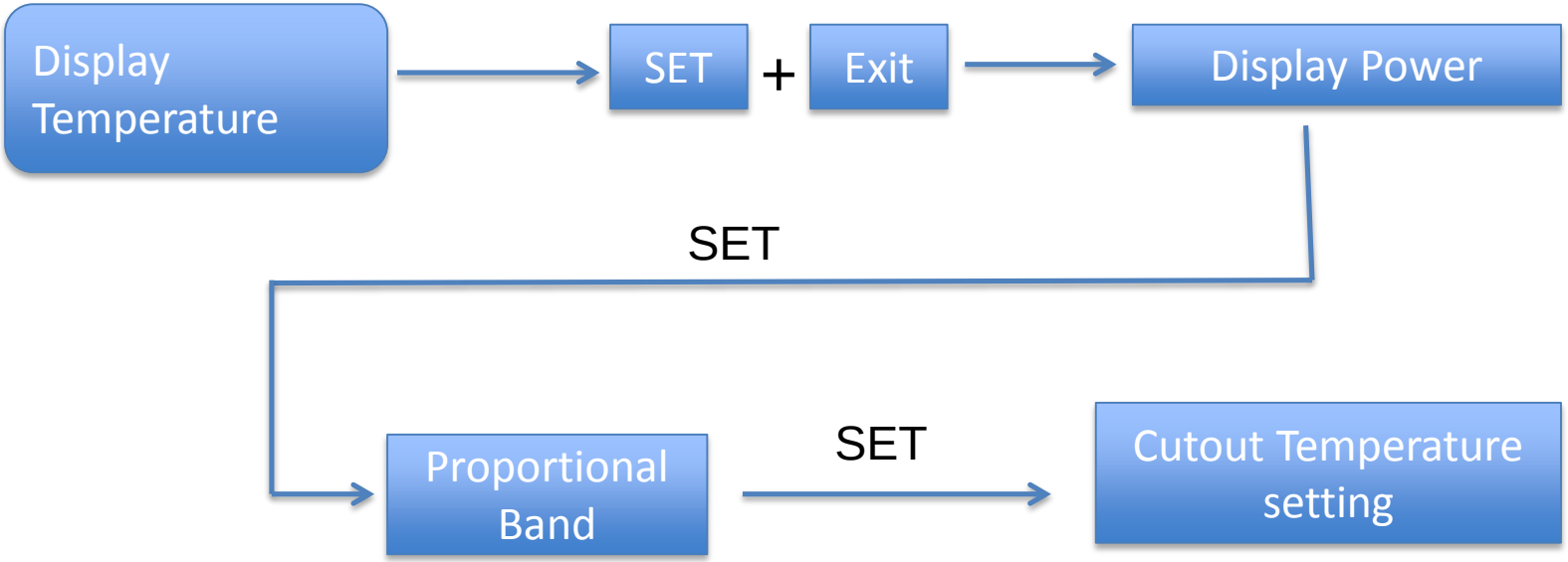
- Keep the well of the calibrator clean and clear of any foreign matter
  - DO NOT use fluid to clean out the well
  - DO NOT use thermal grease
- Do not force or twist probes and inserts into the well
- Oxidation will occur in both hot and cold drywells
- Clean off with Scotch Brite or 400+ grit sand paper
- If a sleeve should be dropped, examine the sleeve for deformities before inserting it in the well

# 2. Maintain the wells

- Do not allow the probe stems or inserts to drop into the well or harshly impact the well bottom. This action can cause a shock to the sensor.
- Avoid mechanical shock or dropping the calibrator.
- Use a gun or tube/pipe cleaning kit

# 3. Check the over-temperature cutout

- The over-temperature cutout should be checked every 6 months to see that it is working properly. In order to check the user selected cutout, follow the controller directions for setting the cutout. Set the instrument temperature higher than the cutout. Check to see if the display shows cutout and the temperature is decreasing.



# 3. Check the over-temperature cutout

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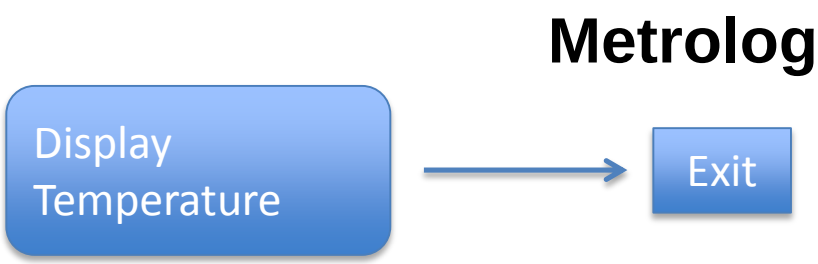
## Drywells

- Set a the cutout to a temperature that is below the maximum set point of the drywell
- Set the unit to a temperature higher than the temperature you set the cutout
- When the unit reaches the cutout set point the display will flash cut out and the power to the heaters will be cut.

# 3. Check the over-temperature cutout




- Set a the cutout to a temperature that is below the maximum set point of the drywell
- Set the unit to a temperature higher than the temperature you set the cutout
- When the unit reaches the cutout set point the display will flash cut out and the power to the heaters will be cut

# Why maintain your Micro-bath?

- To extend the life of  the unit
- Better measurements
- Prevent “down time”

# Micro-bath maintenance tips

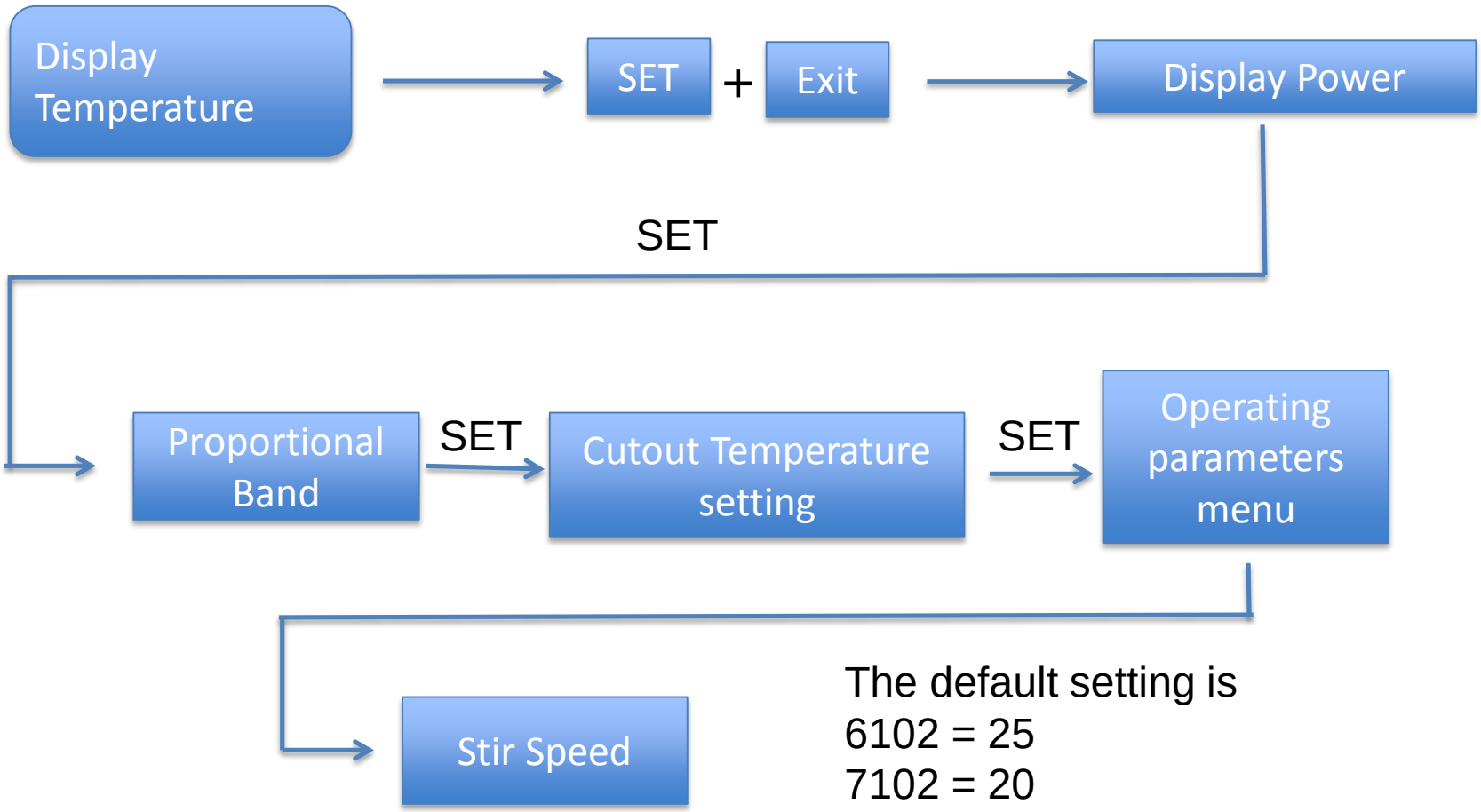
1. Clean the micro-bath exterior
2. Adjust the stir motor speed
3. Check the stir bar
4. Avoid using water in the 7102 micro-bath

# 1. Clean the micro-bath exterior

- Clean any oil at the top of the well
- Clean dust from the vents
- Clean the finger guard at the bottom of the unit

# 2. Adjust the stir motor speed

- Stir motor speed adjustment



# 3. Check the stir bar

- Stir bars will lose their magnetism with time and usage
- Periodically they will need to be replaced
- To replace a stir bar, use a magnet on the end of rod or a set of tongs to remove

# 4. Avoid water in the 7102 micro-bath

## Do not use water in the 7102

- If a scratch develops in the paint and it exposes the aluminum tank, the water will become a catalyst for the aluminum and the steel basket
- The two will create a battery effect that will eat through the tank

# Technical Support Team

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# Thank you

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