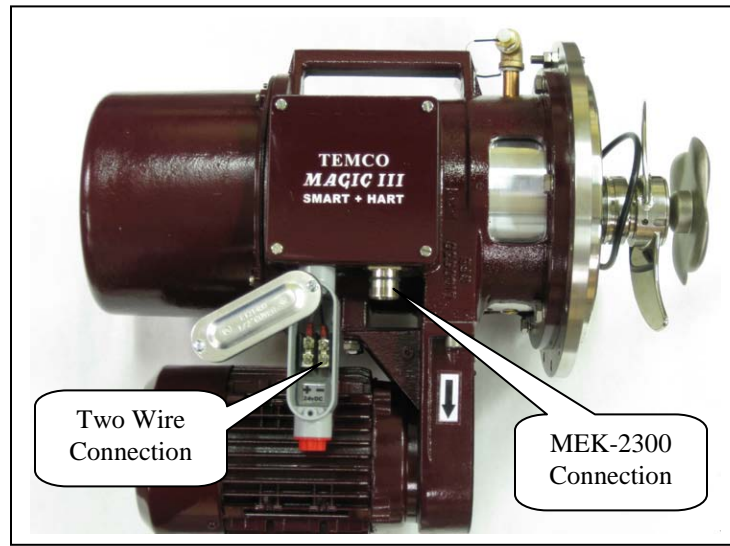


# TEMCO Engineering

## *MAGIC III* Installation and Calibration



### IMPORTANT NOTES

- The *MAGIC III* can be powered by the MEK-2300 electronic box or a two wire connection.
- To prevent ground loops the shield should be grounded at the computer and not at the consistency meter.
- A new o-ring gasket for the flange is supplied with each consistency meter.

The *MAGIC III* is a sensitive measuring unit – Handle with care!

- ➔ **Do not turn** the measuring shaft by hand using the sensing element. This can overload and **damage** the measuring system.
- ➔ Use the handle when lifting the *MAGIC III*.
- ➔ Be careful not to damage the mechanical seal or the sensing element.
- ➔ Save the protective shipping cover, and install on the unit being removed for repair.

### INSTALLATION

- 1) Bolt down with M8 x 25 long screws.
- 2) Remove vent screw on TEMCO Engineering's **Self Contained Cooling System** (see Figure 1). For a DHX **Double Heat Exchange** system, connect cooling water with a flow at least 10-15 gallons per hour.
- 3) Connect motor power and check rotation.
  - Clockwise – Looking from the top of the *MAGIC III* fiberglass cover. ↻
- 4) Connect 24-30 volts **DC** power. Power + to *MAGIC III* +, - to the - leg.  
Minimum voltage at 20ma should be at least 13.0VDC at terminal strip.
- 5) Screw on the cable if using the MEK-2300 power supply. No wiring changes required.
- 6) Turn motor **OFF**, remove fiberglass cover over electronics.
- 7) Connect digital voltmeter to test points. Adjust coil (see Figure 2) to 6.10 volts DC. For DHX model, adjust to 6.00 volts DC.
- 8) Move torque arm, **DC** voltage at test points should swing between 6.0 and about 7.0 volts. (see Figure 2)
- 9) Remove voltmeter, install cover, and turn motor **ON**.

## SETTING UPPER & LOWER RANGE VALUE WITH HART COMMUNICATOR

Connect one lead of the communicator to the positive terminal and one lead to the negative terminal, or connect the leads across the dropping resistor.

Push ON Button (O/-).

- 1) Select NEXT until “Ignore next 50 occurrences of status” screen
- 2) Select YES

From Home Screen

- 1) Select Line 4 (PV LRV), push Right Arrow Key

From LRV and URV Screen

- 1) Select Line 1 (PV LRV), push Right Arrow Key
- 2) Type in desired LRV , push (ENTER)

From LRV and URV Screen

- 1) Select Line 2 (PV URV) , push Right Arrow Key
- 2) Type in desired URV, push (ENTER)
- 3) Push (SEND)
- 4) Push (HOME)

## FIRST TIME ZERO ADJUSTMENT

- 1) Put consistency loop in automatic control.
- 2) Obtain lab sample. Record the **MAGIC III** signal at the time the sample is taken.
- 3) Adjust coil to match lab samples. **Hint: 1%Cs = 0.1 volts at test jacks.**
- 4) For example, 0.5% Cs = 0.05 volt change at test jacks.

## OTHER ZERO ADJUSTMENTS

- Make a Zero Adjustment when a **series of lab results** shows a consistent error in the same direction with system in automatic.
- ❖ After the First Time Zero Adjustment, output adjustments should be one half the error shown between the labs and the meter.
  - Consistency error **greater** than 0.5% adjust Thermacoil. **Hint: 1%Cs = 0.1 volts at test jacks.**
  - Consistency error **less** than 0.5% shift LRV/URV with the Hart.

**MAGIC** is reading high, ADD the error to the LRV & URV.

**MAGIC** is reading low, SUBTRACT the error from the LRV & URV.

### LRV and URV Change EXAMPLE

**MAGIC** = 3.5 % Con.; Labs Av. = 3.7 % Con.; Error = -0.2%

**MAGIC** is reading low, so subtract error from LRV and URV

**LRV** = 2 % - Adjust to 1.8%      **URV** = 5 % - Adjust to 4.8%

Output at the Control Room will go up .2% to a 3.7% Con. output.

## ***MAGIC* CURVE SELECTION**

In order to change curves the HART communicator must have the correct drivers of ABB TS11 and TH02.

From Home Screen

- 1) Select Line 1 (DEVICE SETUP) – Push Right Arrow Key
- 2) Select Line 4 (DETAILED SETUP) – Push Right Arrow Key
- 3) Select Line 1 (SENSORS) – Push Right Arrow Key
- 4) Select Line 1 (SENSOR CONFIG.) – Push Right Arrow Key
- 5) Screen shows (PLEASE WAIT) – then states (CAUTION – LOOP SHOULD BE REMOVED FROM AUTOMATIC CONTROL!)
- 6) Verify that the loop is in Manual Control and Push (OK)
  - \* This takes you through a configuration process.
  - \* The only parameter you want to change is the Number of Sensors (Multiplier)
- 7) Sensor Type Screen – Select (FREE STYLE) – Push (ENTER)
- 8) Type of Measurement Screen – Select (mV) – Push (ENTER)
- 9) Mains Filters Screen – Select (60 HERTZ) – Push (ENTER)
- 10) Process Units Screen – (Spcl) – Push (ENTER)
- 11) Number of Sensors Screen (TEMCO Multiplier)

Select Desired numbered sensor

Use the up and down arrow to highlight the desired number

<b>Furnish</b>	<b><i>MAGIC III</i> Curves</b>
Unbleached Stock	9
Bleached Softwood	8
Unbleached Hardwood	7
OCC	7
Bleached Hardwood	6
Recycle Newsprint	6

- 12) Push (ENTER)
- 13) Sensor Monitoring Screen – Select (NO MONITORING)
- 14) Push (ENTER)
- 15) Communicator sends the changes and returns to SENSOR Screen
- 16) Push Home to return to the Home Screen.

Pulp Mill Application	Kappa	<i>MAGIC III</i> Curve
Blow Tank	> 80	7
Blow Tank	< 80	9
Using Standard Square Sensor.		

Pulp Mill Application	<i>MAGIC III</i> Curve
Washers	7
Using Large Square Sensor.	

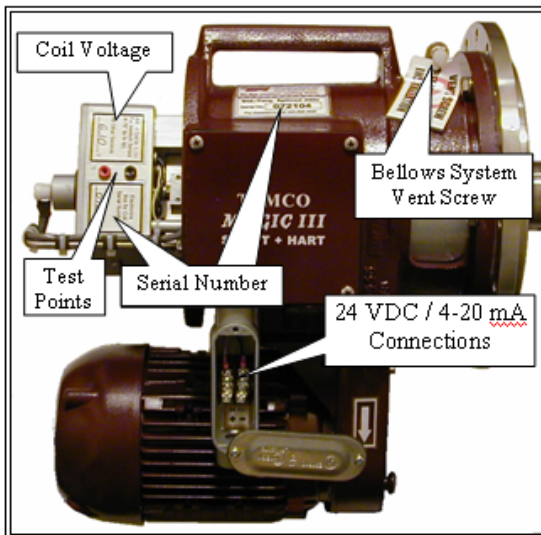


Figure # 1

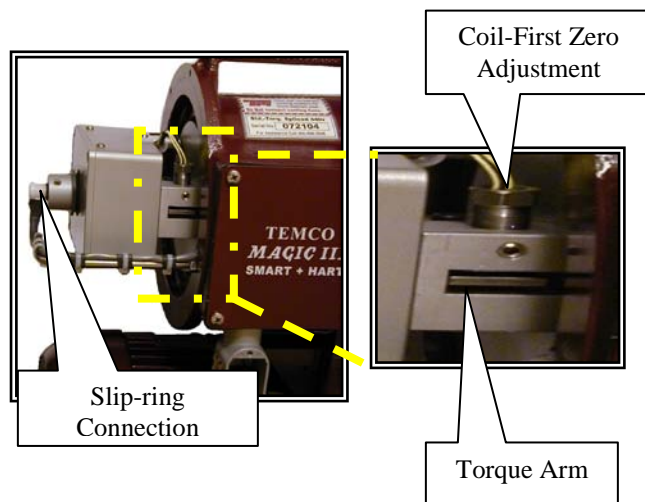


Figure # 2

### **TROUBLE SHOOTING TIPS**

Constant error between <b>MAGIC</b> and labs	Check coil voltage setting * – if okay refer to Output Adjustments to change zero
Varying error with changes in consistency	Refer to Output Adjustments to change sensitivity with the Curve Number
<b>MAGIC</b> output does not change	<ul style="list-style-type: none"> <li>▪ Check power supply for a min of 13.0 VDC @20mA output</li> <li>▪ Verify that the Box and Coil are working by pushing the torque arm to simulate the full DC range at the test points.</li> </ul>

**TROUBLE SHOOTING PROCEDURE**

1. Transmitter Serial Number	
2. Rotate unit by hand to insure it is free to move and is not obstructed by <b>DRIED</b> stock.	<input type="checkbox"/> Yes <input type="checkbox"/> No
3. What is the supply voltage at terminals inside conduit box? Minimum of 13.0 vdc @ 20mA. Push torque arm to simulate 100% output.	<input type="checkbox"/> Yes <input type="checkbox"/> No
4. Check test point Voltage with <u>MOTOR OFF</u> .	<input type="checkbox"/> VDC
5. Does test point Voltage go <u>UP</u> when torque arm is pushed toward the coil and <u>DOWN</u> when pushed away from the coil?	<input type="checkbox"/> Yes <input type="checkbox"/> No
7. Does Current Output follow the test point voltage changes?	<input type="checkbox"/> Yes <input type="checkbox"/> No

Independent Consistency Experts since 1985



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