

DAFTAR ISI

| | |
|--------------------------------------------------|------|
| LAPORAN TUGAS AKHIR..... | i |
| HALAMAN PENGESAHAN..... | iv |
| PERYATAAN | v |
| HALAMAN PERSEMBAHAN | vi |
| HALAMAN MOTTO | vii |
| KATA PENGANTAR | viii |
| DAFTAR ISI..... | xi |
| DAFTAR GAMBAR | xii |
| DAFTAR TABEL..... | xiii |
| INTISARI..... | xiv |
| ABSTRACT..... | xv |
| BAB I PENDAHULUAN..... | 1 |
| 1.1. Latar Belakang | 1 |
| 1.1.1. Perumusan Masalah | 2 |
| 1.1.2. Manfaat Penelitian | 2 |
| 1.2. Tujuan Penelitian..... | 3 |
| 1.3. Batasan Masalah..... | 3 |
| 1.4. Metode Penelitian..... | 3 |
| 1.5. Sistematika Penulisan..... | 4 |
| BAB II LANDASAN TEORI..... | 6 |
| 2.1. Tinjauan Pustaka | 6 |
| 2.2. Dasar Teori..... | 7 |
| 2.2.1. <i>Cooling Water Bath</i> | 7 |
| 2.2.2. <i>Relay</i> | 8 |
| 2.2.3. <i>Motor 3 Phase</i> | 11 |
| 2.2.4. <i>PHE ((Plate Heat Exchanger))</i> | 13 |

| | | |
|-------------------------------------|---------------------------------------------|-----|
| 2.2.5. | Sensor Suhu..... | 14 |
| 2.2.4. | Kontrol Suhu | 20 |
| BAB III METODOLOGI PENELITIAN | | 22 |
| 3.1. | Waktu dan Tempat Penelitian | 22 |
| 3.2. | Alat dan Bahan | 22 |
| 3.2.1. | Alat..... | 22 |
| 3.1.1. | Bahan..... | 22 |
| 3.3. | Analisis Kebutuhan Sistem | 23 |
| 3.3.1. | Diskripsi Sistem | 23 |
| 3.3.2. | Diagram Blok Sistem | 25 |
| 3.4. | Perancangan Perangkat Keras | 25 |
| 3.4.1. | Dimensi dan Bentuk Sistem Kontrol suhu..... | 26 |
| 3.4.2. | Wiring Diagram | 27 |
| 3.4.3. | Diagram Alir Perangkat | 28 |
| 3.5. | Jadwal Kegiatan | 30 |
| BAB IV HASIL DAN PEMBAHASAN | | 31 |
| 4.1. | Pengujian Sensor Suhu | 32 |
| 4.2. | Pemasangan Sistem kontrol..... | 34 |
| 4.3. | Pembahasan | 34 |
| BAB V PENUTUP..... | | 40 |
| 5.1. | Kesimpulan..... | 40 |
| 5.2. | Saran | 40 |
| DAFTAR PUSTAKA | | 41 |
| LAMPIRAN | | 413 |

DAFTAR GAMBAR

| | |
|----------------------------------------------------------------------------------------------|----|
| Gambar 2.1 <i>Cooling bath</i> | 8 |
| Gambar 2.2 Konstruksi <i>relay</i> (Maulana, 2016) | 9 |
| Gambar 2.3 <i>Relay</i> (Maulana, 2016) | 9 |
| Gambar 2.4 <i>Driver relay</i> (Maulana, 2016) | 11 |
| Gambar 2.5 Motor 3 <i>Phase</i> | 12 |
| Gambar 2.6 PHE ((<i>Plate Heat Exchanger</i>))..... | 13 |
| Gambar 2.7 <i>thermocouple</i> (Wilson,2005)..... | 15 |
| Gambar 2.8 <i>Resistance Temperature Detector</i> (Gosi Desgraha 2015)..... | 16 |
| Gambar 2.9 a. <i>Thermistor</i> jenis NTC; b. <i>Thermistor</i> jenis PTC (Tigor 2016) | 17 |
| Gambar 2.10 IC sensor LM35 (Rachmawat 2008) | 18 |
| Gambar 2.11 Diagram blok kontroler proporsional (Rico 2012)..... | 21 |
| Gambar 3.1 Diagram Blok Sistem | 25 |
| Gambar 3.2 Desain panel tampak depan..... | 26 |
| Gambar 3.3 Desain panel bagian dalam..... | 26 |
| Gambar 3.4 <i>Wiring Diagram</i> | 27 |
| Gambar 3.5 <i>Flowchart</i> | 28 |
| Gambar 4.1 <i>bucket</i> pada <i>cooling bath</i> | 31 |
| Gambar 4.2 Pengujian Sensor RTD PT100 | 32 |
| Gambar 4.3 Denah Pemasangan sensor suhu pada <i>cooling bath</i> | 34 |
| Gambar 4.4 e-SIC pada tanggal 17/05/2017 <i>shift</i> 1 | 36 |

DAFTAR TABEL

| | |
|------------------------------------------------------|----|
| Tabel 2.1 Kelebihan dan Kekurangan Sensor | 19 |
| Tabel 3.1 Jadwal Kegiatan Magang | 30 |
| Tabel 4.1 Hasil pengujian sensor | 33 |
| Tabel 4.2 perhitungan 17-05-2017 untuk 1 motor | 38 |