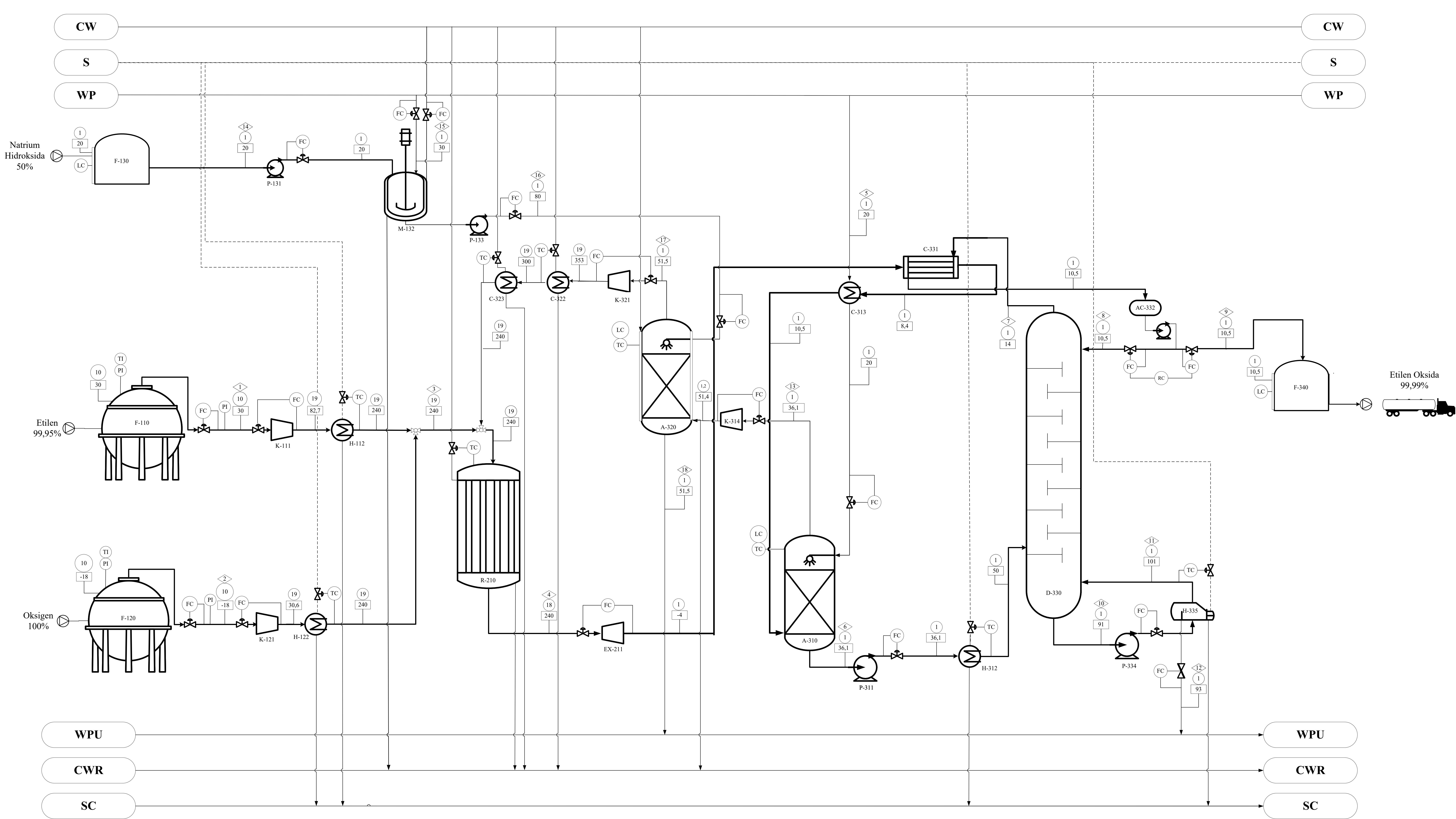


FLOWSHEET PRA RANCANGAN PABRIK ETILEN OKSIDA DARI ETILEN DAN OKSIGEN  
 DENGAN PROSES OKSIDASI ETILEN KAPASITAS 60.000 TON/TAHUN



| Keterangan |                       |
|------------|-----------------------|
|            | Aliran Massa (Kg/Jam) |
|            | Tekanan (Atm)         |
|            | Suhu (°C)             |
|            | Cooling Water         |
|            | Saturated Steam       |
|            | Water Process         |
|            | Waste Process Unit    |
|            | Cooling Water Return  |
|            | Steam Condensate      |

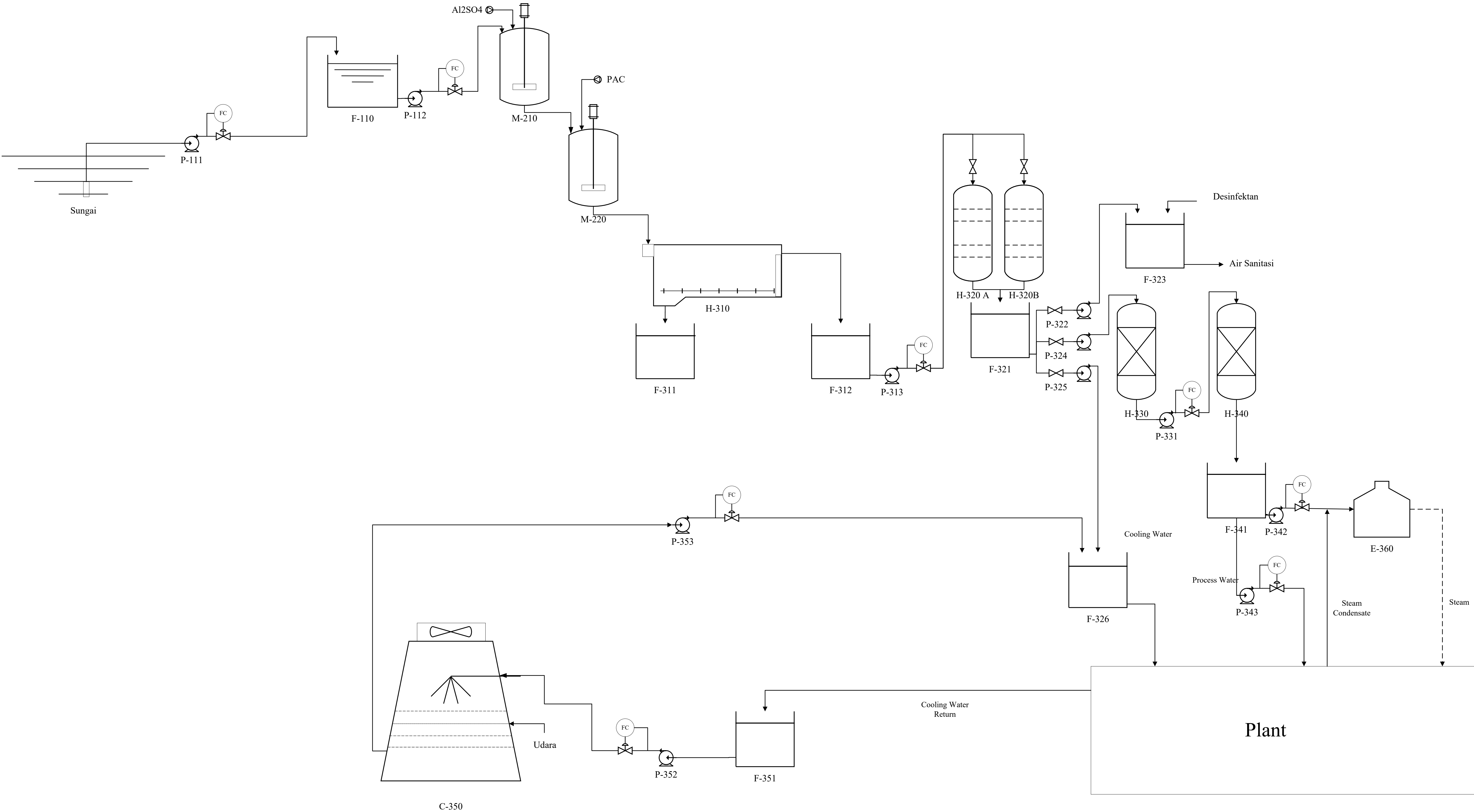
| No | Kode   | Nama Alat                                 |
|----|--------|-------------------------------------------|
| 1  | F-110  | Tangki Penyimpanan Etilen                 |
| 2  | K-111  | Kompresor 1                               |
| 3  | H-112  | Heater 1                                  |
| 4  | F-120  | Tangki Penyimpanan Oksigen                |
| 5  | K-121  | Kompresor 2                               |
| 6  | H-122  | Heater 2                                  |
| 7  | R-210  | Reaktor                                   |
| 8  | EX-211 | Ekspander 2                               |
| 9  | A-310  | Absorber 1                                |
| 10 | P-311  | Pompa 1                                   |
| 11 | H-312  | Heater 3                                  |
| 12 | C-313  | Cooler 1                                  |
| 13 | D-330  | Distilasi                                 |
| 14 | C-331  | Kondensor                                 |
| 15 | AC-332 | Akumulator                                |
| 16 | F-340  | Tangki Penampungan Etilen Oksida          |
| 17 | P-334  | Pompa 2                                   |
| 18 | H-335  | Reboiler                                  |
| 19 | K-314  | Kompresor 3                               |
| 20 | A-320  | Absorber 2                                |
| 21 | K-321  | Kompresor 4                               |
| 22 | C-322  | Cooler 2                                  |
| 23 | F-130  | Tangki Penyimpanan Natrium Hidroksida 50% |
| 24 | P-131  | Pompa 3                                   |
| 25 | M-132  | Tangki Pelarutan                          |
| 26 | P-133  | Pompa 4                                   |

| Aliran Massa (Kg/Jam)               |             |             |             |             |             |             |             |            |             |              |             |             |             |             |            |             |             |             |
|-------------------------------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|------------|-------------|--------------|-------------|-------------|-------------|-------------|------------|-------------|-------------|-------------|
| Komponen                            | Aliran 1    | Aliran 2    | Aliran 3    | Aliran 4    | Aliran 5    | Aliran 6    | Aliran 7    | Aliran 8   | Aliran 9    | Aliran 10    | Aliran 11   | Aliran 12   | Aliran 13   | Aliran 14   | Aliran 15  | Aliran 16   | Aliran 17   | Aliran 18   |
| C <sub>2</sub> H <sub>4</sub> (l)   | -           | -           | -           | -           | -           | 65,2681     | -           | -          | -           | 215,6383     | -           | 101,5213    | -           | -           | -          | -           | -           | -           |
| C <sub>2</sub> H <sub>4</sub> (g)   | 24.612,3916 | -           | 24.612,3916 | 17.724,3676 | -           | -           | -           | -          | -           | -            | 114,1171    | -           | 17.659,0995 | -           | -          | -           | 17.659,0995 | -           |
| C <sub>2</sub> H <sub>6</sub> (l)   | -           | -           | -           | -           | -           | 0,0060      | -           | -          | -           | -            | 0,0211      | -           | 0,0099      | -           | -          | -           | -           | -           |
| C <sub>2</sub> H <sub>6</sub> (g)   | 12,3124     | -           | 12,3124     | 8,6186      | -           | -           | -           | -          | -           | -            | 0,0112      | -           | 8,6127      | -           | -          | -           | 8,6127      | -           |
| O <sub>2</sub> (l)                  | -           | -           | -           | -           | -           | 1,7197      | -           | 0,0002     | 0,0003      | 6,4813       | -           | 3,0514      | -           | -           | -          | -           | -           | -           |
| O <sub>2</sub> (g)                  | -           | 14.039,1539 | 14.039,1539 | 4.490,5639  | -           | -           | 0,0004      | -          | -           | -            | 3,4299      | -           | 4.488,8441  | -           | -          | -           | 4.488,8441  | -           |
| CO <sub>2</sub> (l)                 | -           | -           | -           | -           | -           | 81,9987     | -           | 0,1640     | 0,3605      | 424,2104     | -           | 199,7158    | -           | -           | -          | -           | -           | -           |
| CO <sub>2</sub> (g)                 | -           | -           | -           | 6.178,6316  | -           | -           | 0,5243      | -          | -           | -            | 224,4946    | -           | 6.096,6329  | -           | -          | -           | -           | -           |
| H <sub>2</sub> O (l)                | -           | -           | -           | -           | 77.303,0910 | 79.834,4581 | -           | 0,2395     | 0,2155      | 169.400,9536 | -           | 79.752,9722 | -           | -           | 62.892,219 | -           | -           | 76.565,8075 |
| H <sub>2</sub> O (g)                | -           | -           | -           | 2.531,3671  | -           | -           | 0,3135      | -          | -           | -            | 89.647,9815 | -           | -           | -           | -          | -           | -           | -           |
| C <sub>2</sub> H <sub>4</sub> O (l) | -           | -           | -           | -           | -           | 7.590,9395  | -           | 7.575,7576 | 16.667,4286 | 78,7705      | -           | 37,0847     | -           | -           | -          | -           | -           | -           |
| C <sub>2</sub> H <sub>4</sub> O (g) | -           | -           | -           | 7.730,3091  | -           | -           | 24.243,5325 | -          | -           | -            | 41,6858     | -           | 139,3696    | -           | -          | -           | -           | -           |
| NaOH (s)                            | -           | -           | -           | -           | -           | -           | -           | -          | -           | -            | -           | -           | -           | -           | -          | -           | -           | -           |
| NaOH (l)                            | -           | -           | -           | -           | -           | -           | -           | -          | -           | -            | -           | -           | -           | 11.178,0000 | -          | 74.070,2186 | -           | -           |
| C2H6O (l)                           | -           | -           | -           | -           | -           | -           | -           | -          | -           | -            | -           | -           | -           | -           | -          | -           | -           | 196,4147    |
| Na <sub>2</sub> CO <sub>3</sub> (l) | -           | -           | -           | -           | -           | -           | -           | -          | -           | -            | -           | -           | -           | -           | -          | -           | -           | 14.721,9990 |
| Total                               | 24.624,7040 | 14.039,1539 | 38.663,8579 | 38.663,8579 | 77.303,0910 | 87.574,3901 | 24.244,3707 | 7.576,1612 | 16.668,0048 | 170.126,0754 | 90.031,7202 | 80.094,3552 | 28.392,5588 | 11.178,0000 | 62.892,219 | 74.070,2186 | 22.156,5563 | 91.484,2211 |

| DISUSUN OLEH :                                                                       |                                                                                                                           |
|--------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------|
| ALIYYA NISA BUDI UTAMI                                                               | (22031010130)                                                                                                             |
| DOSEN PEMBIMBING :                                                                   |                                                                                                                           |
| (Renova Panjaitan, S.T., M.T.)<br>NIP. 19950623 202406 2003                          |                                                                                                                           |
| FLOWSHEET PABRIK ETILEN OKSIDA DARI ETILEN DAN OKSIGEN DENGAN PROSES OKSIDASI ETILEN |                                                                                                                           |
|                                                                                      | PROGRAM STUDI TEKNIK KIMIA<br>FAKULTAS TEKNIK & SAINS<br>UNIVERSITAS PEMBANGUNAN NASIONAL<br>"VETERAN" JAWA TIMUR<br>2026 |

UNIT PENGOLAHAN AIR

PRA-RANCANGAN PABRIK ETILEN OKSIDA DARI ETILEN DAN OKSIGEN DENGAN PROSES OKSIDASI ETILEN



| No | Kode  | Nama Alat                            |
|----|-------|--------------------------------------|
| 1  | P-111 | Pompa 1                              |
| 2  | F-110 | Bak Penampung Air Sungai             |
| 3  | P-112 | Pompa 2                              |
| 4  | M-210 | Tangki Koagulasi                     |
| 5  | M-220 | Tangki Flokulasi                     |
| 6  | H-310 | Clarifier                            |
| 7  | F-311 | Bak Penampung Flok Clarifier         |
| 8  | F-312 | Bak Penampung Air Bersih Clarifier   |
| 9  | P-313 | Pompa 5                              |
| 10 | H-320 | Sand Filter                          |
| 11 | F-321 | Bak Penampung Air Bersih Sand Filter |
| 12 | P-322 | Pompa 6                              |
| 13 | F-323 | Bak Penampung Air Sanitasi           |
| 14 | P-324 | Pompa 7                              |
| 15 | P-325 | Pompa 8                              |
| 16 | F-326 | Bak Penampung Air Pendingin          |
| 17 | H-330 | Kation Exchanger                     |
| 18 | P-331 | Pompa 9                              |
| 19 | H-340 | Anion Exchanger                      |
| 20 | F-341 | Bak Penampung Demineralisasi         |
| 21 | P-342 | Pompa 10                             |
| 22 | F-351 | Bak Penampung Air Bekas Pendingin    |
| 23 | P-352 | Pompa 11                             |
| 24 | C-350 | Cooling Tower                        |
| 25 | P-353 | Pompa 12                             |
| 26 | E-360 | Boiler                               |

DISUSUN OLEH :

ALIYYA NISA BUDI UTAMI (22031010130)

DOSEN PEMBIMBING :

(Renova Panjaitan, S.T., M.T.)  
NIP. 19950623 202406 2003

FLowsheet Pabrik Etilen Oksida dari Etilen dan Oksigen dengan Proses Oksidasi Etilen

PROGRAM STUDI TEKNIK KIMIA  
FAKULTAS TEKNIK & SAINS  
UNIVERSITAS PEMBANGUNAN NASIONAL  
“VETERAN” JAWA TIMUR  
2026