

# Case Study

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# Granulator

Manufacturer: Rapid

**integra**<sup>TM</sup>  
intelligent fixed speed motor control



# Case Study

Any plastic that does not meet the production standards gets granulated and re-used. This process can take a couple of hours so and when the roll has been fully granulated back into reusable plastic, the Granulator has the potential to be left on for long periods of time. If the Rapid Granulator has been left running unloaded for more than 20 min, the Integra unit will automatically switch it off.

The Suresense motor controller is specially designed for Granulators and more importantly does not change the speed of the motor. The way the controller saves the energy is by controlling voltage, Current and torque.

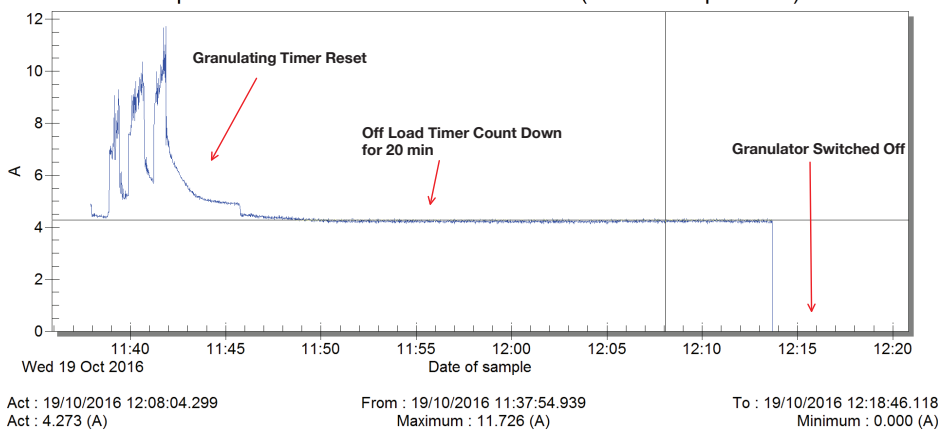
## Company

Rapid

## Test Details

|                      |            |
|----------------------|------------|
| Type of Machine:     | Granulator |
| Manufacturer:        | Rapid      |
| Motor Size:          | 55kW       |
| Motor Energy Rating: | IE1        |

Rapid Dual Blade with Timed Cut off.STD (Current: Triphasic ~)



## On Load Savings

Current

44%

Power kW

23%

kVAr

67%

## Benefits

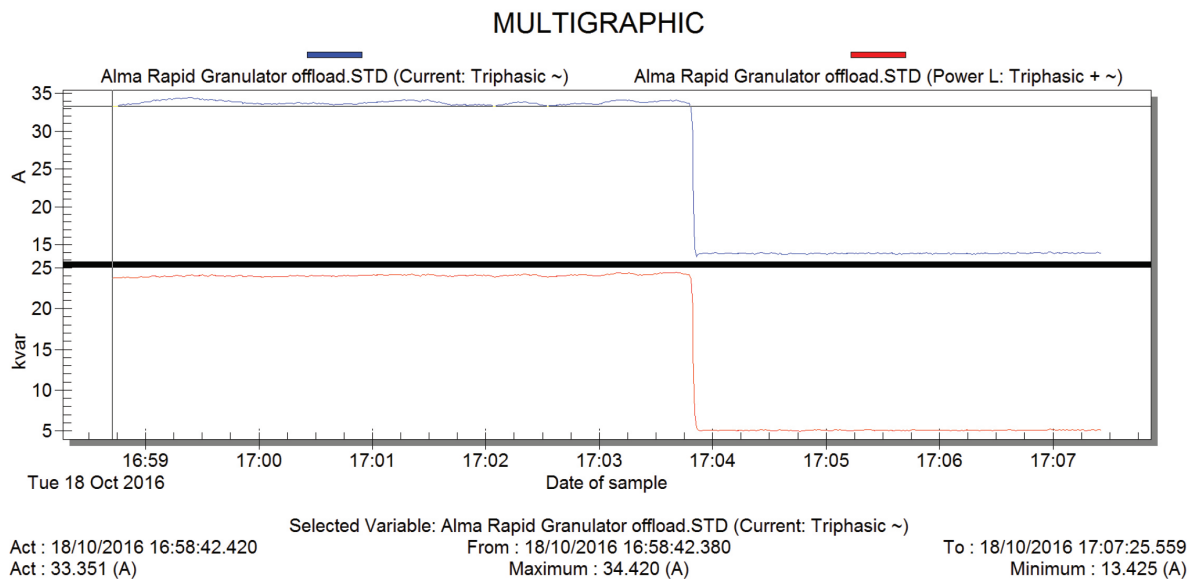
The Integra motor controller is specially designed for Granulators and more importantly does not change the speed of the motor. The way the controller saves the energy is by controlling voltage, current and torque according to the motor shaft load.

[suresense.co.uk](http://suresense.co.uk)

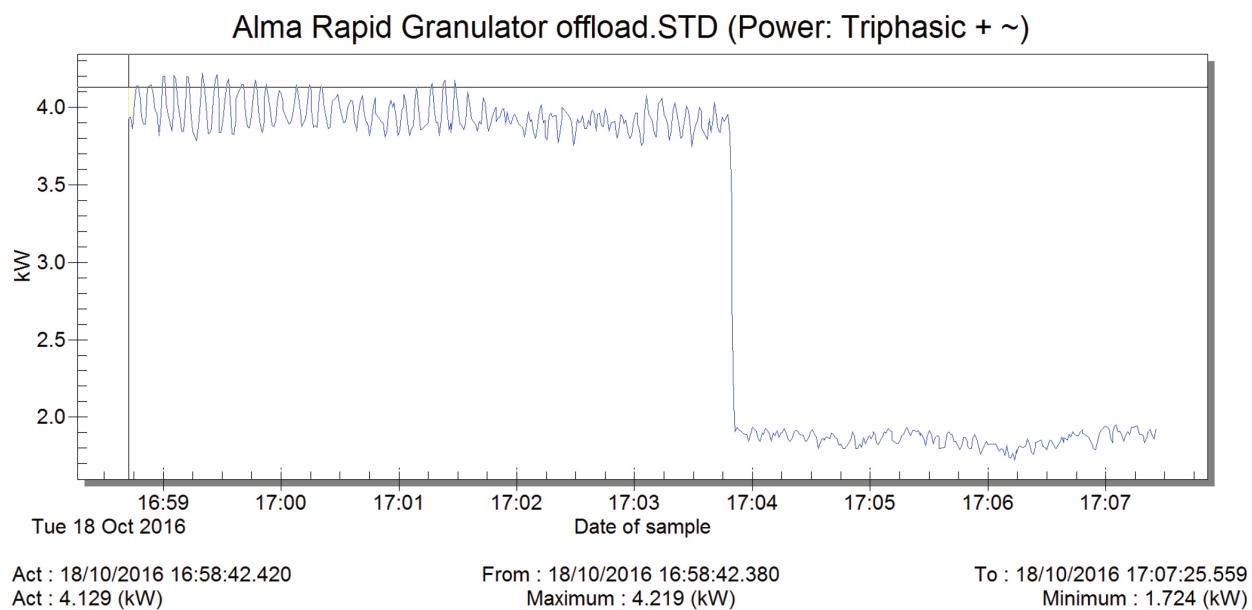


# Off Load Savings

## Off Load Current and kVAr Graph:



## Off Load kW Graph:



# Off Load Savings Data

## Without Integra:

| 1 | Date       | Time    | Current: Triphasic ~ (A) | Power: Triphasic + ~ (kW) | Power L: Triphasic + ~ (kvar) |
|---|------------|---------|--------------------------|---------------------------|-------------------------------|
| 2 | 18/10/2016 | 58:42.4 | 33.351                   | 4.129                     | 23.453                        |
| 3 | 18/10/2016 | 58:42.4 | 33.313                   | 3.927                     | 23.479                        |
| 4 | 18/10/2016 | 58:43.3 | 33.326                   | 3.936                     | 23.525                        |
| 5 | 18/10/2016 | 58:44.3 | 33.351                   | 3.863                     | 23.525                        |
| 6 | 18/10/2016 | 58:45.3 | 33.338                   | 4.028                     | 23.507                        |
| 7 | 18/10/2016 | 58:46.2 | 33.441                   | 4.139                     | 23.516                        |

| 1   | Date       | Time    | Current: Triphasic ~ (A) | Power: Triphasic + ~ (kW) | Power L: Triphasic + ~ (kvar) |
|-----|------------|---------|--------------------------|---------------------------|-------------------------------|
| 307 | 18/10/2016 | 03:34.0 | 34.072                   | 3.972                     | 24.155                        |
| 308 | 18/10/2016 | 03:34.0 | 34.021                   | 3.872                     | 24.156                        |
| 309 | 18/10/2016 | 03:37.0 | 34.046                   | 3.79                      | 24.165                        |
| 310 | 18/10/2016 | 03:37.9 | 34.098                   | 3.926                     | 24.175                        |
| 311 | 18/10/2016 | 03:38.9 | 33.995                   | 3.835                     | 24.111                        |
| 312 | 18/10/2016 | 03:39.8 | 34.059                   | 3.926                     | 24.175                        |
| 313 | 18/10/2016 | 03:40.8 | 34.098                   | 4.035                     | 24.183                        |
| 314 | 18/10/2016 | 03:41.8 | 34.008                   | 3.945                     | 24.119                        |
| 315 | 18/10/2016 | 03:42.7 | 33.982                   | 3.854                     | 24.119                        |
| 316 |            | Average | 33.80                    | 3.95                      | 23.81                         |
| 317 |            |         |                          |                           |                               |

## With Integra:

| 1   | Date       | Time    | Current: Triphasic ~ (A) | Power: Triphasic + ~ (kW) | Power L: Triphasic + ~ (kvar) |
|-----|------------|---------|--------------------------|---------------------------|-------------------------------|
| 320 | 18/10/2016 | 03:54.2 | 13.786                   | 1.908                     | 4.737                         |
| 321 | 18/10/2016 | 03:55.2 | 13.863                   | 1.899                     | 4.818                         |
| 322 | 18/10/2016 | 03:56.1 | 13.888                   | 1.89                      | 4.855                         |
| 323 | 18/10/2016 | 03:57.1 | 13.914                   | 1.889                     | 4.819                         |
| 324 | 18/10/2016 | 03:58.1 | 13.837                   | 1.843                     | 4.828                         |
| 325 | 18/10/2016 | 03:59.0 | 13.837                   | 1.888                     | 4.827                         |

| 1   | Date       | Time    | Current: Triphasic ~ (A) | Power: Triphasic + ~ (kW) | Power L: Triphasic + ~ (kvar) |
|-----|------------|---------|--------------------------|---------------------------|-------------------------------|
| 530 | 18/10/2016 | 07:16.9 | 13.876                   | 1.889                     | 4.801                         |
| 531 | 18/10/2016 | 07:17.9 | 13.85                    | 1.889                     | 4.773                         |
| 532 | 18/10/2016 | 07:18.8 | 13.914                   | 1.881                     | 4.846                         |
| 533 | 18/10/2016 | 07:19.8 | 13.914                   | 1.834                     | 4.855                         |
| 534 | 18/10/2016 | 07:20.8 | 13.863                   | 1.861                     | 4.937                         |
| 535 | 18/10/2016 | 07:21.7 | 13.914                   | 1.907                     | 4.92                          |
| 536 | 18/10/2016 | 07:22.7 | 13.85                    | 1.917                     | 4.792                         |
| 537 | 18/10/2016 | 07:23.6 | 14.043                   | 1.881                     | 4.892                         |
| 538 | 18/10/2016 | 07:24.6 | 13.85                    | 1.861                     | 4.892                         |
| 539 | 18/10/2016 | 07:25.6 | 13.902                   | 1.926                     | 4.82                          |
| 540 |            | Average | 13.85                    | 1.86                      | 4.84                          |
| 541 |            | Savings | 59%                      | 53%                       | 80%                           |
| 542 |            |         |                          |                           |                               |

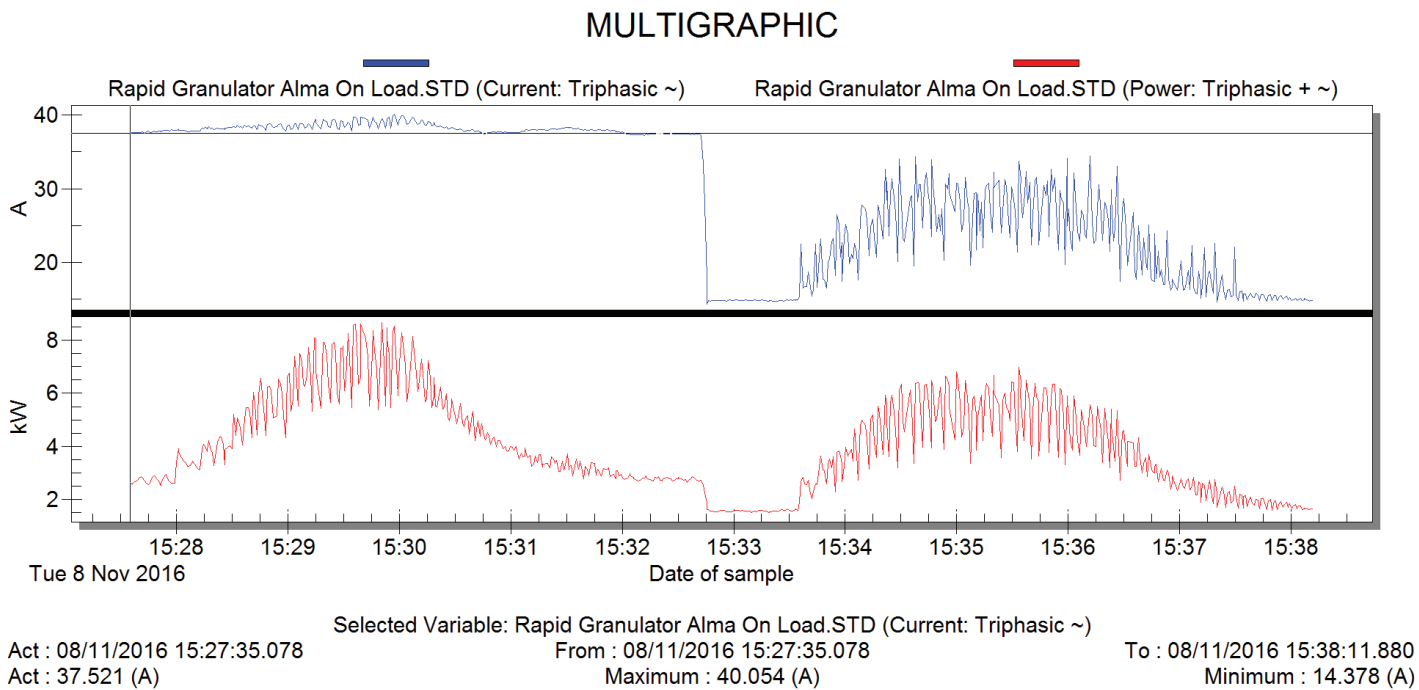
## Savings with Integra

|            |     |
|------------|-----|
| Current    | 59% |
| Power (kW) | 53% |
| kVAr       | 80% |

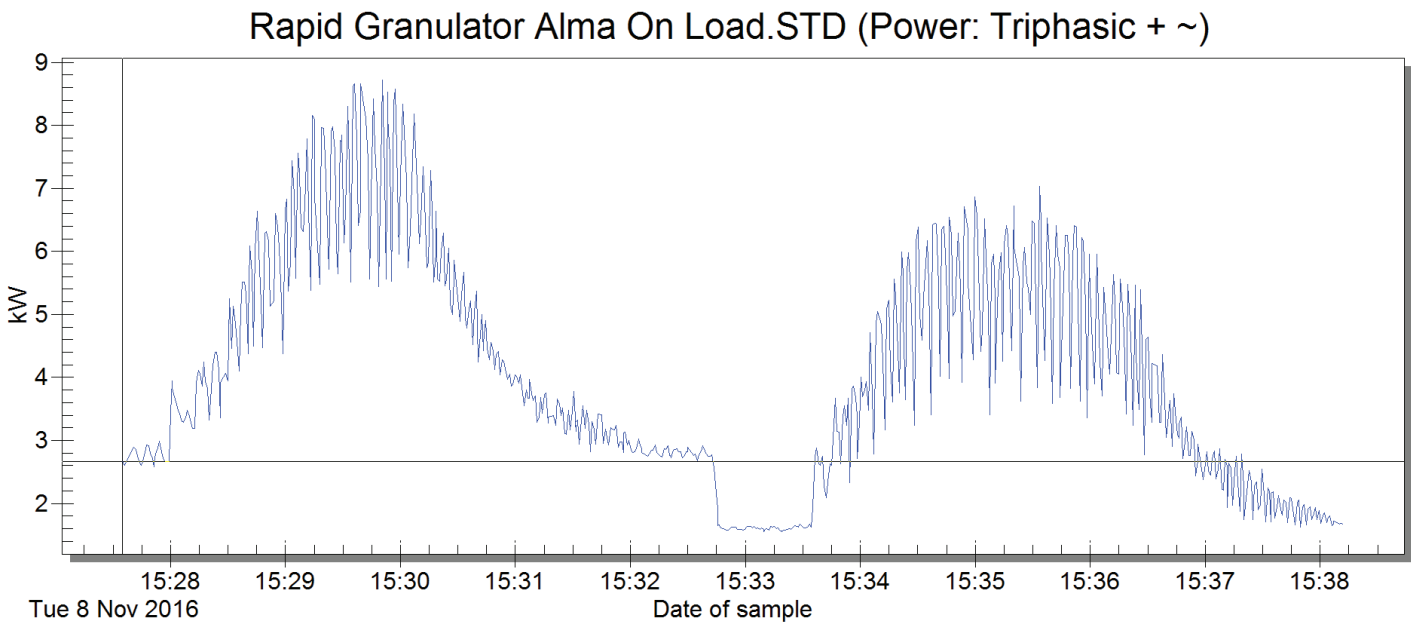


# On Load Savings Data

## On Load Current and kVAr Graph:



## On Load kW Graph:



# On Load Savings Data

## On Load Current and kVAr Graph:

| 1 | Date       | Time    | Current: Triphasic ~ (A) | Power: Triphasic + ~ (kW) | Power L: Triphasic + ~ (kvar) |
|---|------------|---------|--------------------------|---------------------------|-------------------------------|
| 2 | 08/11/2016 | 27:35.1 | 37.521                   | 2.619                     | 26.881                        |
| 3 | 08/11/2016 | 27:36.0 | 37.598                   | 2.555                     | 26.952                        |
| 4 | 08/11/2016 | 27:36.0 | 37.612                   | 2.563                     | 26.943                        |
| 5 | 08/11/2016 | 27:39.0 | 37.637                   | 2.719                     | 26.962                        |
| 6 | 08/11/2016 | 27:39.9 | 37.573                   | 2.801                     | 26.853                        |
| 7 | 08/11/2016 | 27:40.9 | 37.624                   | 2.847                     | 26.87                         |

| 1   | Date       | Time    | Current: Triphasic ~ (A) | Power: Triphasic + ~ (kW) | Power L: Triphasic + ~ (kvar) |
|-----|------------|---------|--------------------------|---------------------------|-------------------------------|
| 311 | 08/11/2016 | 32:33.0 | 37.407                   | 2.709                     | 27.136                        |
| 312 | 08/11/2016 | 32:33.9 | 37.418                   | 2.738                     | 27.136                        |
| 313 | 08/11/2016 | 32:34.9 | 37.392                   | 2.628                     | 27.126                        |
| 314 | 08/11/2016 | 32:35.9 | 37.444                   | 2.727                     | 27.144                        |
| 315 | 08/11/2016 | 32:36.8 | 37.355                   | 2.782                     | 27.062                        |
| 316 | 08/11/2016 | 32:37.8 | 37.367                   | 2.864                     | 27.043                        |
| 317 | 08/11/2016 | 32:38.7 | 37.354                   | 2.784                     | 27.027                        |
| 318 |            | Average | 38.17                    | 4.59                      | 27.06                         |

## On Load kW Graph:

| 1   | Date       | Time    | Current: Triphasic ~ (A) | Power: Triphasic + ~ (kW) | Power L: Triphasic + ~ (kvar) |
|-----|------------|---------|--------------------------|---------------------------|-------------------------------|
| 323 | 08/11/2016 | 32:48.3 | 14.79                    | 1.55                      | 5.524                         |
| 324 | 08/11/2016 | 32:49.3 | 14.88                    | 1.533                     | 5.496                         |
| 325 | 08/11/2016 | 32:50.2 | 14.829                   | 1.525                     | 5.496                         |
| 326 | 08/11/2016 | 32:51.2 | 14.841                   | 1.525                     | 5.478                         |
| 327 | 08/11/2016 | 32:52.1 | 14.803                   | 1.56                      | 5.476                         |
| 328 | 08/11/2016 | 32:53.1 | 14.88                    | 1.569                     | 5.522                         |
| 329 | 08/11/2016 | 32:54.1 | 14.828                   | 1.578                     | 5.513                         |

| 1   | Date       | Time        | Current: Triphasic ~ (A) | Power: Triphasic + ~ (kW) | Power L: Triphasic + ~ (kvar) |
|-----|------------|-------------|--------------------------|---------------------------|-------------------------------|
| 650 | 08/11/2016 | 38:02.3     | 15.125                   | 1.806                     | 5.568                         |
| 651 | 08/11/2016 | 38:03.2     | 14.79                    | 1.641                     | 5.477                         |
| 652 | 08/11/2016 | 38:04.2     | 14.945                   | 1.733                     | 5.486                         |
| 653 | 08/11/2016 | 38:05.1     | 15.15                    | 1.752                     | 5.551                         |
| 654 | 08/11/2016 | 38:06.1     | 14.841                   | 1.597                     | 5.459                         |
| 655 | 08/11/2016 | 38:07.0     | 14.944                   | 1.624                     | 5.514                         |
| 656 | 08/11/2016 | 38:07.0     | 15.086                   | 1.671                     | 5.623                         |
| 657 | 08/11/2016 | 38:10.0     | 14.764                   | 1.616                     | 5.513                         |
| 658 | 08/11/2016 | 38:10.9     | 14.816                   | 1.633                     | 5.477                         |
| 659 | 08/11/2016 | 38:11.9     | 14.79                    | 1.623                     | 5.458                         |
| 660 |            | Average     | 21.55                    | 3.54                      | 9.00                          |
| 661 |            | Saving Rate | 44%                      | 23%                       | 67%                           |

## Savings with Integra

|            |     |
|------------|-----|
| Current    | 44% |
| Power (kW) | 23% |
| kVAr       | 67% |



intelligent fixed speed motor control

## Energy Efficient

This excess consumption is not only an unnecessary cost in your energy bill, but it also serves to damage your equipment as the excess energy is released through the windings of the motor in the form of heat, vibration and noise. Integra will give your motors intelligence through monitoring the load on the shaft of the motor for every cycle of the supply. The Integra will then feed your motors the electricity that they require to run efficiently at any point in the duty cycle.

## Customers

There are a growing number of forward thinking executives and energy consultants who are taking their corporate responsibilities (CSR) very seriously. In an effort to target carbon reduction and increase their company profits, they have chosen Suresense Technologies energy saving solutions. These implementations were viewed as part of their own energy saving strategy and were driven by two other key factors, low risk and high return on investment (ROI).

## Benefits

**Integra integrates fully with its surroundings and can even switch your motors off automatically when they are not being used, or use stored energy in certain applications (such as flywheel mechanisms) to reduce your electricity consumption even further.**

