

Report on Blanchardstown Refrigeration Installation Run 29th August to 26th September 2002

Equipment used for the Testing:

EnviroStart 400-TPMEC-55
Calibrated Three Phase kWh CT Meter S/No K86G 51119
Calibrated Three 300 – 500 CT Clamps
Calibrated Hours Run Meter
Calibrated Silent Partner Energy Profile Data Logger S/No 2C00495
Calibrated KM1202 Temperature Logger S/No 1340

Test undertaken on Compressor number 2 High Pressure system at Dunne's Blanchardstown, Dublin, Eire.

All Tests and Results Taken Witnessed and Agreed by:

Paul Kiegon	Cross Refrigeration Ltd
Peter Dee	Cool Controls Ltd
Fergus Lowndes	Energy Solutions International Ltd
Pat Burns	Holmar Electrical
Paul Breheny	Energy Consumption Controls
Pierre Hanneffy	Elenco Ltd
John Dunn	Econopower Technical Services Ltd
Martin Hollis	EMS (European) Ltd

All Systems Installed and Commissioned by:

John Dunn
Econopower Technical Services Ltd
123 Willow Park Road
Glasnevin
Dublin 11
Eire

The EnviroStart was fitted to High Pressure compressor number 2 in the plant room between the fuses and the main contactor, with the CT's fitted around the input cables to the EnviroStart. The Hours Run Meter was fitted to the output side of the contactor. The Energy Logger was fitted to the red phase on the input to the motor. The Temperature Logger sensors monitored the temperature immediately outside the plant room doors in a protected area and the temperature inside the doors in a protected area.



The EnviroStart had been installed on the 31st May 2002 to allow settlement and to ensure that there would be no interruption to operation during the testing. The test has been carried out at the request of Michael Dooley of Dunne's Store who wanted a one-month evaluation of the savings achievable through the use of an EnviroStart on a High Pressure Refrigeration System. It was necessary as a part of this evaluation that all tests be observed and verified by Dunne's "trusted" suppliers. A copy of the "counter signature" document is attached at the end of this report.

The results of the test from the kWh meter were:

1. kW Hour meter reading start 29 th August 2002 no energy savings	0000845kW
2. kW Hour meter reading on 12 th September 2002 no energy saving	0003957kW
3. Total kW consumption no energy savings over two weeks	0003112kW
4. Hours run meter start 29 th August 2002	4910.25
5. Hours run meter on 12 th September 2002	5083.95
6. Total hours run no energy savings	173.7
7. Average kWh no energy saving	17.92kW
8. kW Hour meter reading start 12 th September 2002 with energy savings	0003957kW
9. kW Hour meter reading start 26 th September 2002 with energy savings	0007148kW
10. Total kW consumption with energy savings over 2 weeks	0003191kW
11. Hours run meter start 12 th September 2002	5083.95
12. Hours run meter on 26 th September 2002	5291.17
13. Total hours run with energy savings	207.22
14. Average kWh with energy savings	15.4kW

Total savings Achieved	<u>14.06%</u>
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The compressor was used during the first two weeks for an average of 12.5 hours per day this was low as there was a problem within the pack oil pressure controls. During the second two weeks the compressor was on for an average of 14.8 hours per day which was closer to typical running times. As hours run was a critical part of the savings analysis this low utilisation had no impact on the results identified.

As the kWh meter only monitors the power consumption locally and does not take into consideration the site Power factor the true kW per hour usage is higher than the amount stated above and will be closer to the Average kWh monitored by the data logger these results are also included in this pack.

The results of the data logger were:

1. Number of measurements taken between 28.8.02 and 12.9.02	8160
2. Number of measurements taken with current values between 28.8.02 and 12.9.02	4214
3. Running time of motor per day	12.4 hours
4. Average kWh without energy savings	33.86kW
5. Average kW without energy savings per degree C	1.887kW
6. Number of measurements taken between 12.9.02 and 26.9.02	8176
7. Number of measurements taken with current values between 12.9.02 and 26.9.02	5027
8. Running time of motor per day	14.75 hours
9. Average kWh with energy savings	30.36kW
10. Average kW with energy saving per degree C	1.68kW

Total savings from Data logger system	<u>10.34%</u>
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Total savings from data logger with temperature taken into consideration	<u>10.97%</u>
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Taking the three methods of savings into consideration the average savings are 11.79%

Payback Assumptions:

Based on the detail logged the mean savings are $\geq 12\%$. Based on given energy costs of £0.0572p/kWh and a running time of 14hrs/day for 365 days/yr with the current price of an EnviroStart 400-TPMEC-55 of €2,800unit (including installation and commissioning), the payback period calculated will be ≤ 1.9 years.

19th June 2002

REF: Dunnes Stores Blanchardstown.

30 June 2003.

Installation and test of Envirostart equipment.

Pre – Installation inspection ensured that LT Pack was operating normally and was suitable for Installation and test of Envirostart equipment.

4 – 45AMP Envirostart units installed on test to LT Pack.

The attached logs relate to Suction and Discharge pressures monitored before Envirostart test, during Envirostart operation and following the completion of tests.

Monitoring prior to test: Tues June 24th 01:30 to Thurs June 26th 08:45.

Monitoring during Envirostart test: Thurs June 26th 08.45 to Sat June 28th 11.30.

Monitoring after test: Sat June 28th 11.30 to Mon June 30th 07.00.

All pressure logs are in tabular and graph format and downloaded directly for Supervisor 128 in refrigeration plant room.

Based on these logs there was virtually no difference in pressures during normal operation and Envirostart operation.

Yours Sincerely

Chris Brown.

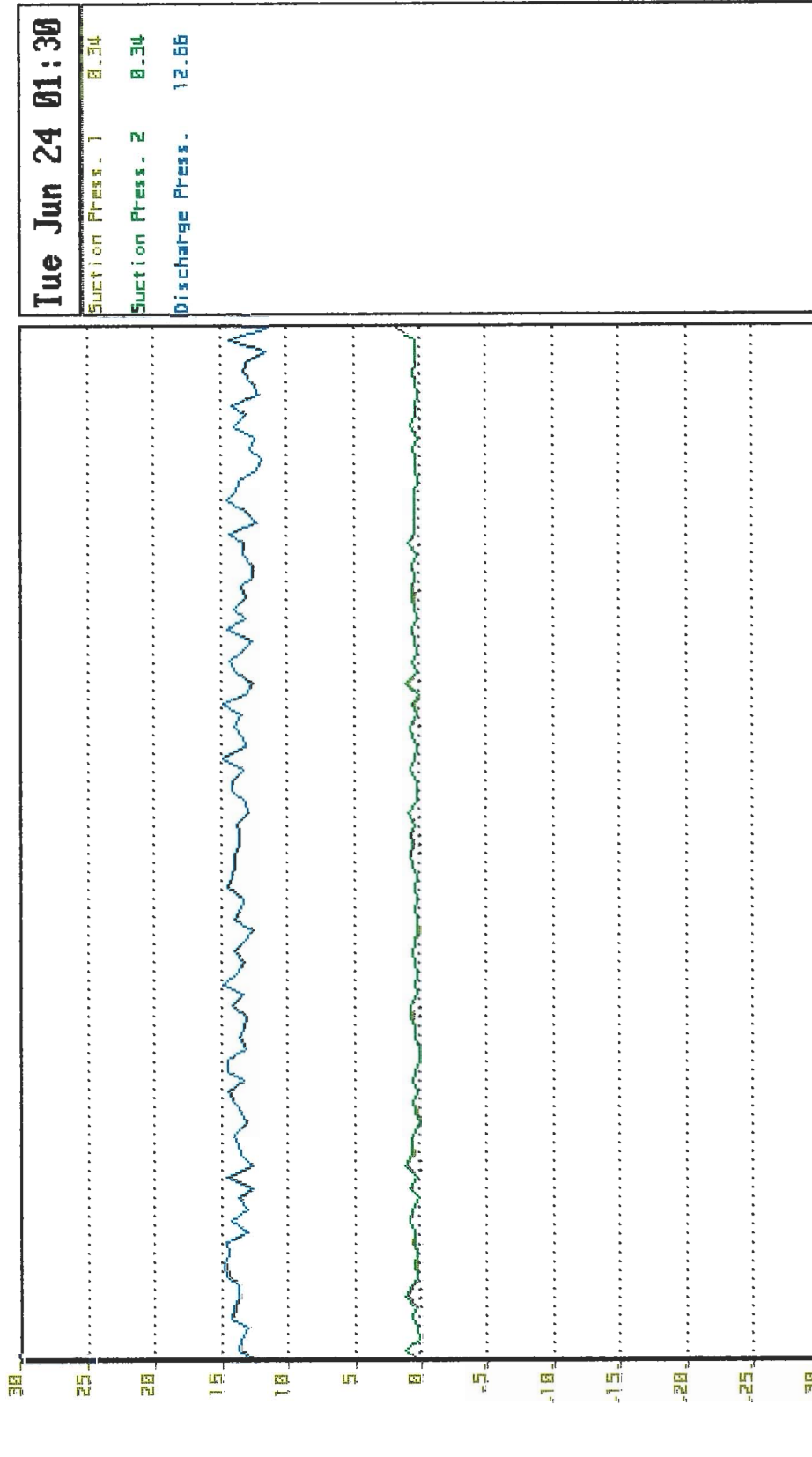
Re: Dunnes Blanchardstown

To Whom It May Concern:

On the request of Martin Hollis cool controls attended site during the testing phase of Envirostart equipment on the 26th June. There were no marked difference on the suction & discharge pressure while equipment was operating under Envirostart compared to normal operation.

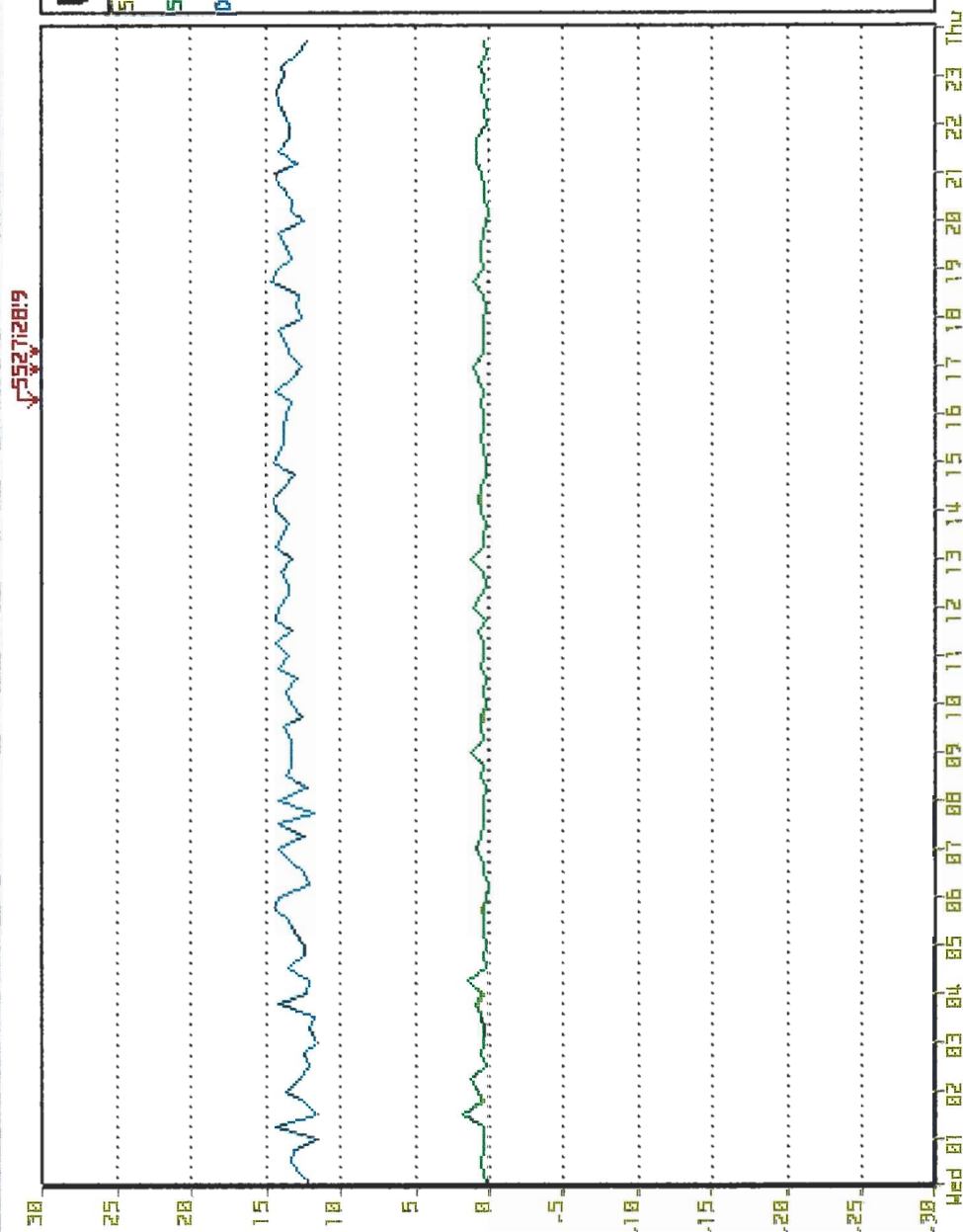
Full details of the logs for these tests are available on request from Cool Controls

Regards
Chris Brown



LI-PCK Pack/Fan Controller

Esc Back F1 Help F2 More F3 Left F4 Right F5 Auto F6 Super F7 Extract



Wed Jun 25 00:00

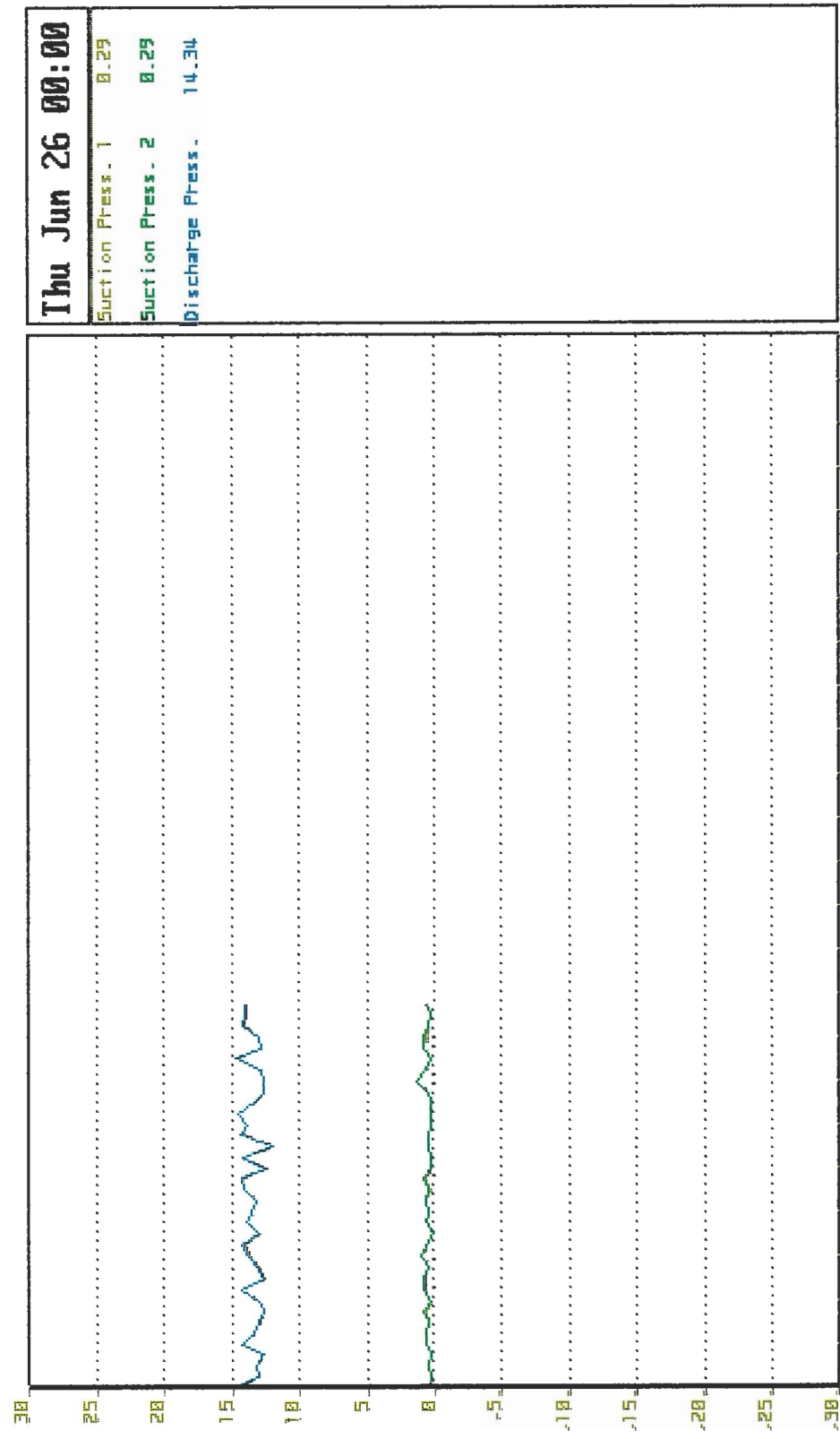
Suction Press. 1 0.15

Suction Press. 2 0.17

Discharge Press. 12.1

LI-PCK Pack/Fan Controller

Back
 Help
 Print
 More
 Left
 Right
 F3 Auto
 F4 All
 F5 Select
 F6 Super
 F7 Extract



LT-PCX Pack/Fan Controller

Esc Back F1 Help F2 More F3 Auto F4 All F5 Select F6 Super F7 Extract

→ Right ← Left

Print

Help

Print

More

Left

Right

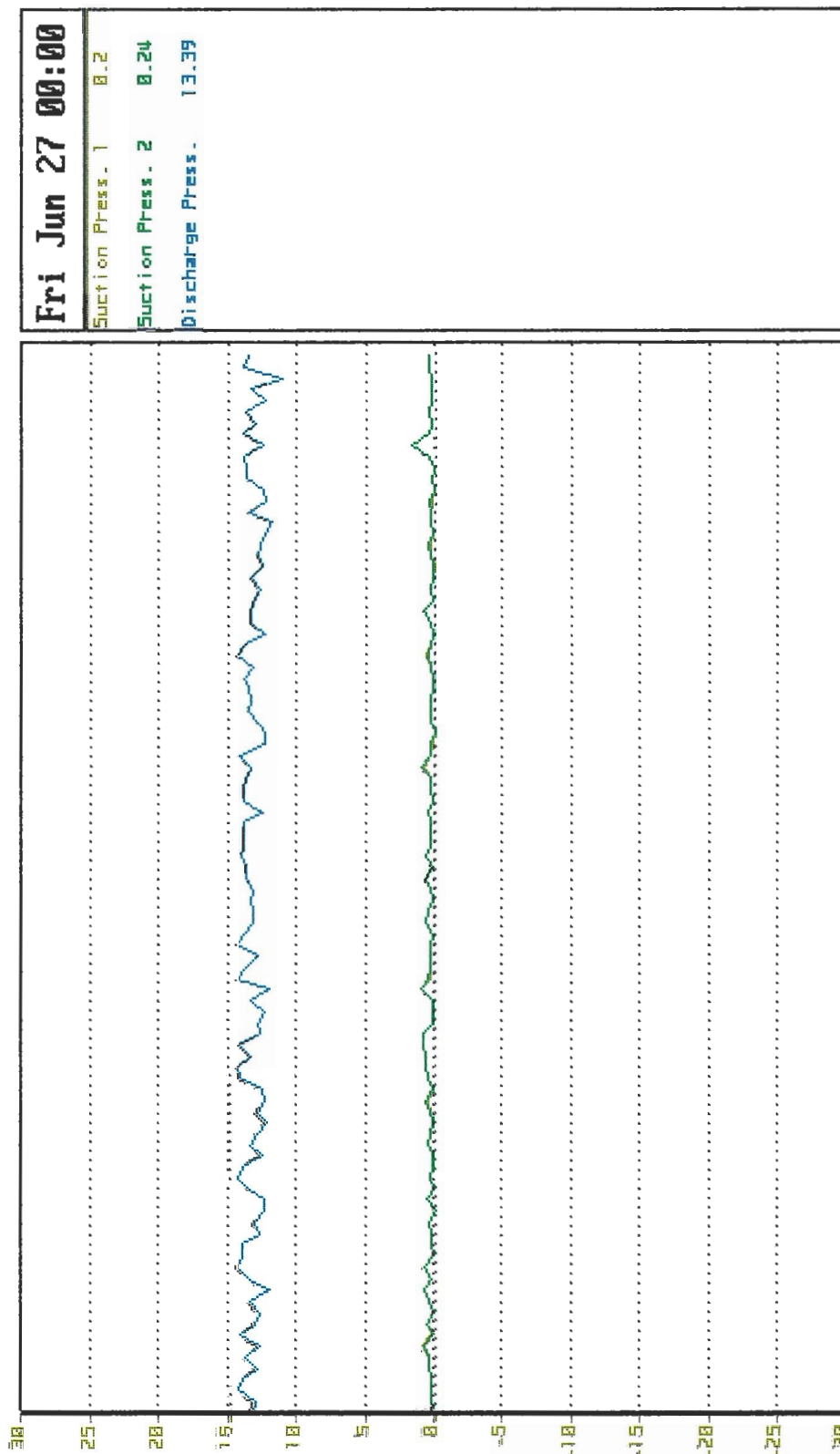
Auto

All

Select

Super

Extract

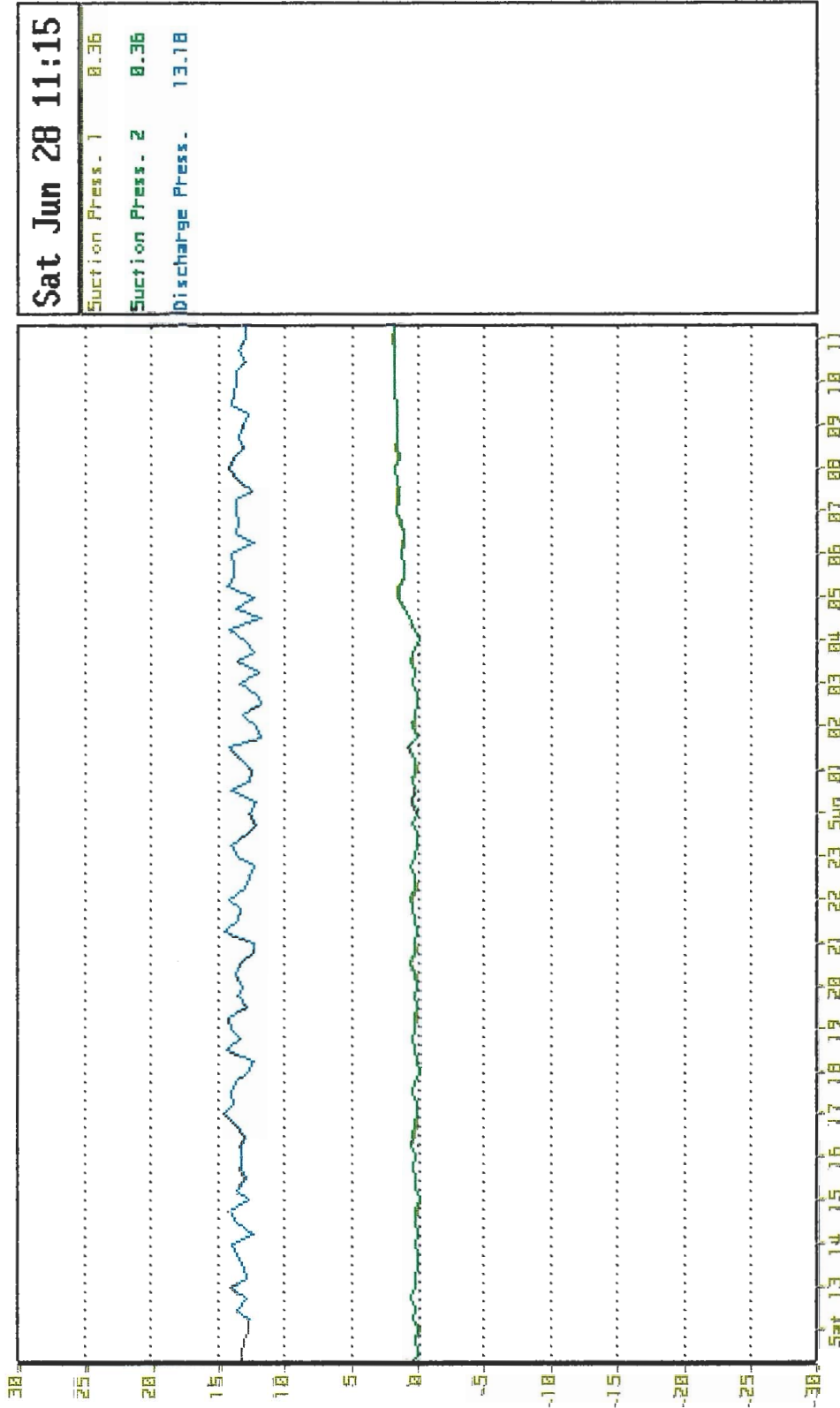


LI-PCK Pack/Fan Controller

Back
 F1
 Help
 Print
 More
 Left
 Right
 F3 Auto
 F4 All
 F5 Select
 F6 Super
 F7 Extract

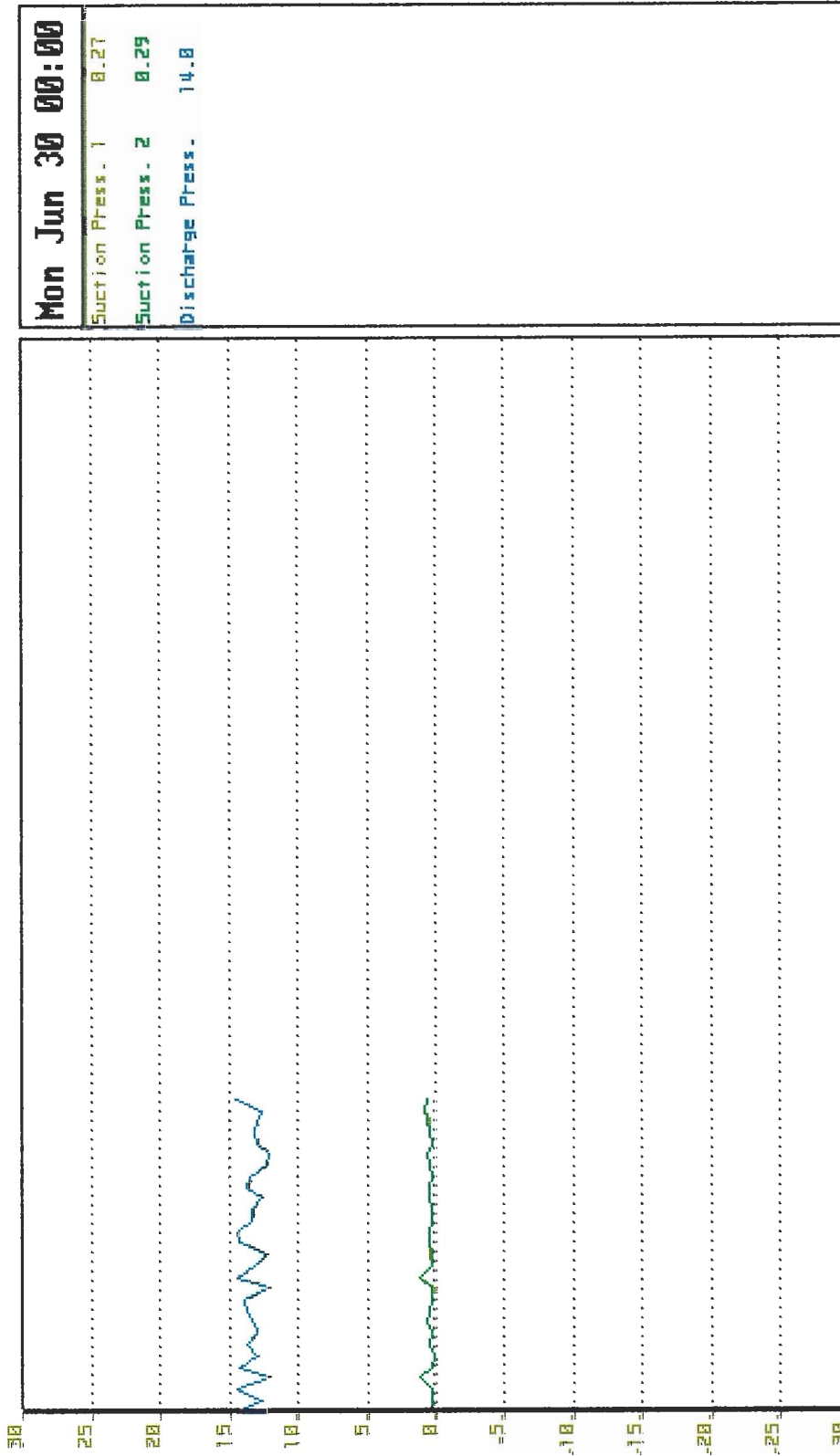
Graphical Review

11-08-03 13:18:30



Ext Back F1 Help Print More Left Right F3 Auto F4 All F5 Select F6 Super F7 Extract

LI-PCK Pack/Fan Controller

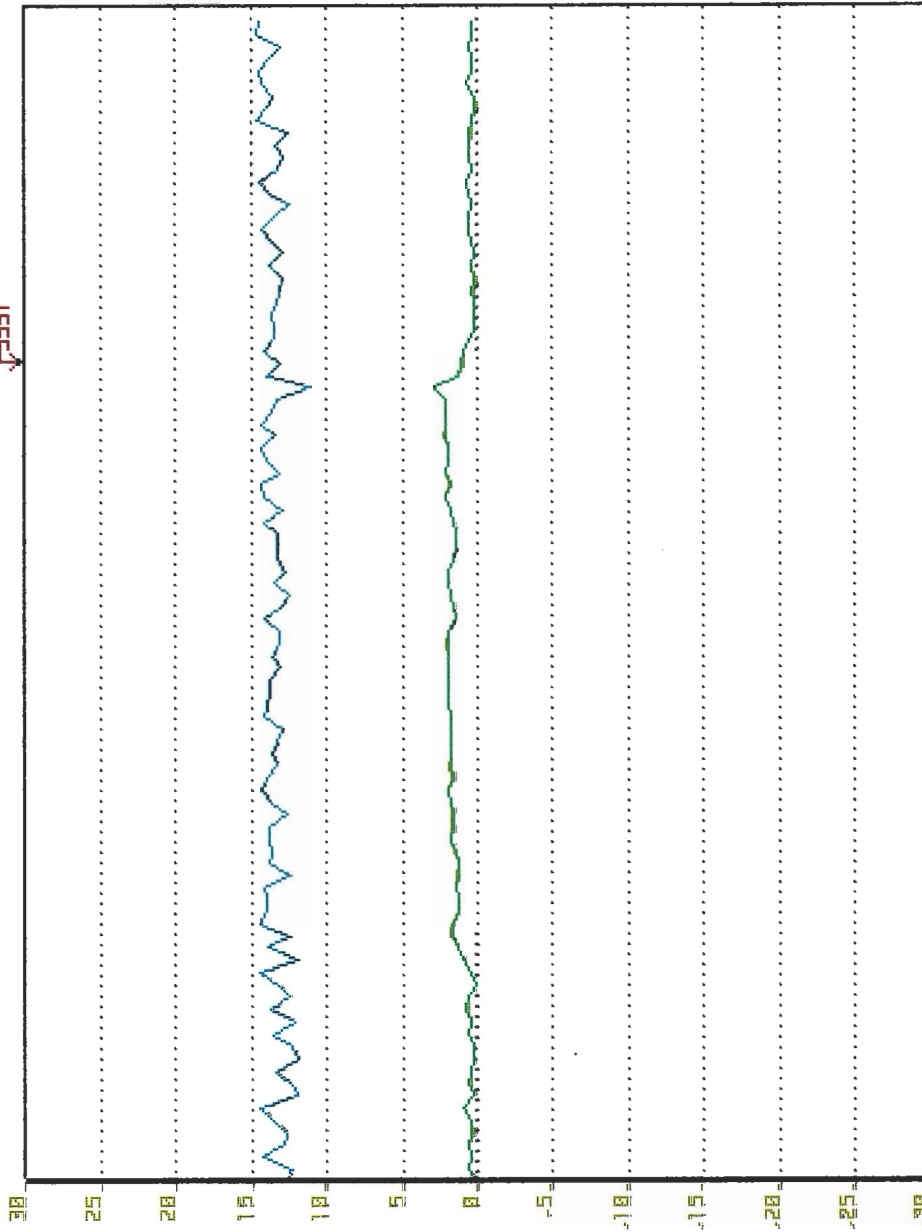


LI-PCX Pack/Fan Controller

Esc Back F1 Help F2 Store F3 Auto F4 All F5 Select F6 Super F7 Extract



5551



Sun 01 02 03 04 05 06 07 08 09 10 11 12 13 14 15 16 17 18 19 20 21 22 23 Mon

Sun Jun 29 00:00
Suction Press. 1 0.1
Suction Press. 2 0.12
Discharge Press. 12.75

Back

F1

Help

Print

F2

More

Left

Right

F3

Auto

F4

All

F5

Select

F6

Super

F7

Extract

LT-PCX Pack/Fan Controller

Customer Dennis Stone

Bacharach

Date of Audit

27.2.03 S. 425

~~Price Per KW~~

Day

Attending

Average

Night

Tel _____
Fax _____**Fax**[illegible]