

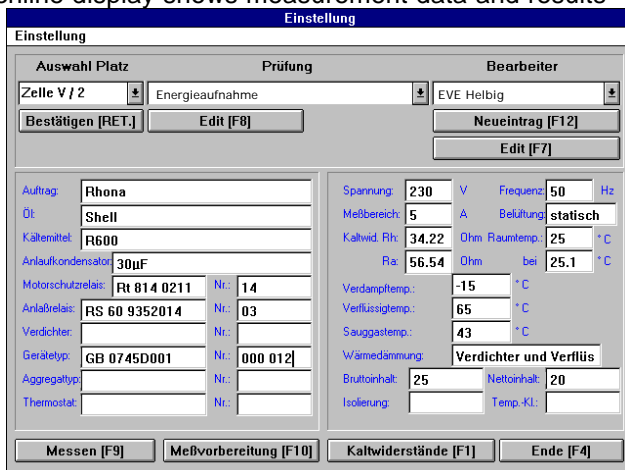
Refrigerator Quality Test Rig

Classifying and characterizing the features of household refrigerators and freezer cabinets are among the routine tasks of their manufacturers. As per national and international standards, refrigerators face a whole barrage of tests. The purpose is not only to classify the test item itself. The test should also show the possibilities to improve the quality and efficiency of a refrigerator.

imc developed an automatic refrigerator quality test rig to test and measure up to 8 different freezer cabinets, iceboxes and fridges. The basis of the test station is the standard imc measurement system μ -MUSYCS. With its standard inputs for voltages and temperatures and its ability to calculate and evaluate the incoming data online, it is an ideal system for such applications. FORON, one of the leading German manufacturers, has chosen this imc system for production tests and development purposes. The three test stands for up to 24 test specimens have to capture and evaluate the following measuring data:

- Power consumption
- 12 different temperatures
- Switch-On time
- Hours of operation
- Suction pressure
- Condenser pressure
- Power

One of the FORON's demands was for a custom user interface allowing relatively untrained personnel be able to perform and to setup a measurement. The online display shows measurement data and results



Einstellung

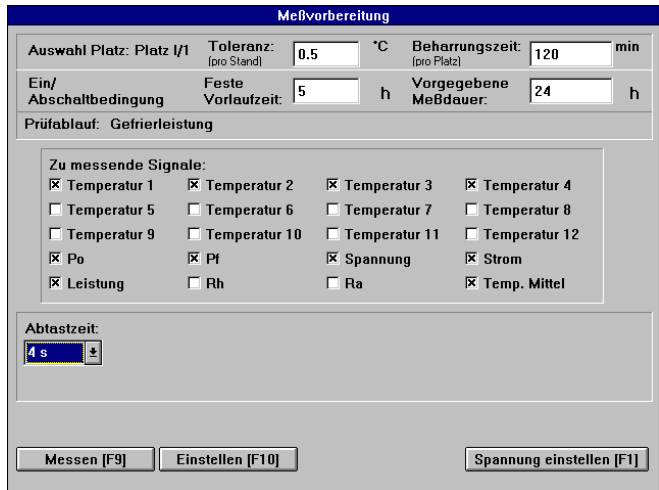
Auswahl Platz: Zelle V/2 Prüfung: Energieaufnahme Bearbeiter: EVE Helbig

Bestätigen [RET.] Edit [F8] Neueintrag [F12] Edit [F7]

Auftrag: Rhona Spannung: 230 V Frequenz: 50 Hz
 Öl: Shell Meßbereich: 5 A Belüftung: statisch
 Kältemittel: R600 Kaltwid. Rh: 34.22 Ohm Raumtemp.: 25 °C
 Anlaufkondensator: 30µF Ra: 56.54 Ohm bei: 25.1 °C
 Motorschutzrelais: Rt 814 0211 Nr.: 14 Verdampftemp.: -15 °C
 Anlaßrelais: RS 60 9352014 Nr.: 03 Verflüssigttemp.: 65 °C
 Verdichter: Sauggastemp.: 43 °C
 Gerätetyp: GB 0745D001 Nr.: 000 012 Wärmedämmung: Verdichter und Verflüss
 Aggregattyp: ThermoStat: Bruttoinhalt: 25 Nettoinhalt: 20
 Isolierung: Temp. KL:

Messen [F9] Meßvorbereitung [F10] Kaltwiderstände [F1] Ende [F4]

The user interface is specially adapted to standard and development tests



Meßvorbereitung

Auswahl Platz: Platz I/1 Toleranz: (pro Stand) 0.5 °C Beharrungszeit: (pro Platz) 120 min
 Ein/Abschaltbedingung: Feste Vorlaufzeit: 5 h Vorgegebene Meßdauer: 24 h
 Prüfablauf: Gefrierleistung

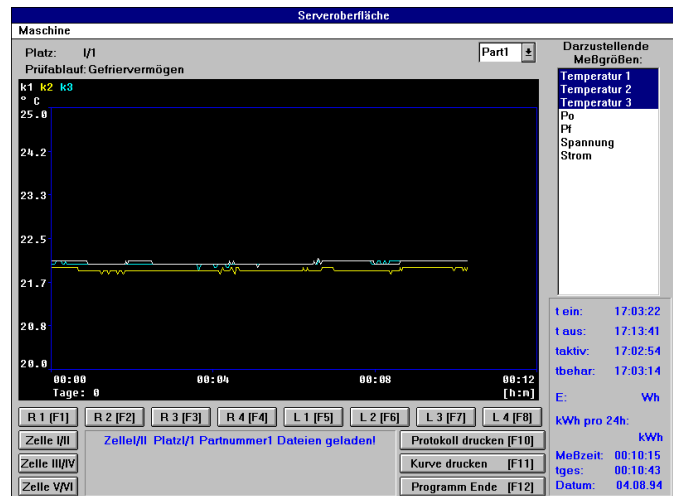
Zu messende Signale:
 Temperatur 1 Temperatur 2 Temperatur 3 Temperatur 4
 Temperatur 5 Temperatur 6 Temperatur 7 Temperatur 8
 Temperatur 9 Temperatur 10 Temperatur 11 Temperatur 12
 Po Pf Spannung Strom
 Leistung Rh Ra Temp. Mittel

Abtastzeit: 4 s

Messen [F9] Einstellen [F10] Spannung einstellen [F1]

A test preparation as easy as can be

calculated online. At the simple click of a mouse or the touch of a function button, the curve window can be changed or filled with live data from different measurements. Furthermore, an automatic printout in accordance with company standards was desired.



The online data display can switch between 24 tested systems

All measurement data, results and reports can be stored on a file server at the company. Using the imc offline data analysis and evaluation tool FAMOS, statistics can be computed as well as comparisons between different trails, tests and refrigerator types. But even additional, advanced efficiency calculations or temperature models can be designed and performed with the help of FAMOS.