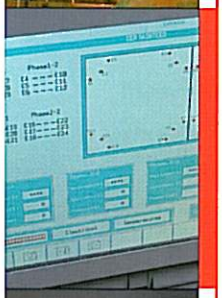
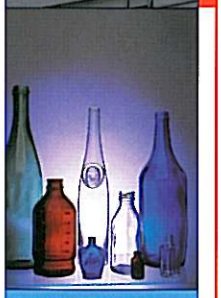



F.I.C. (UK) LIMITED

Tomorrow's Technology Today

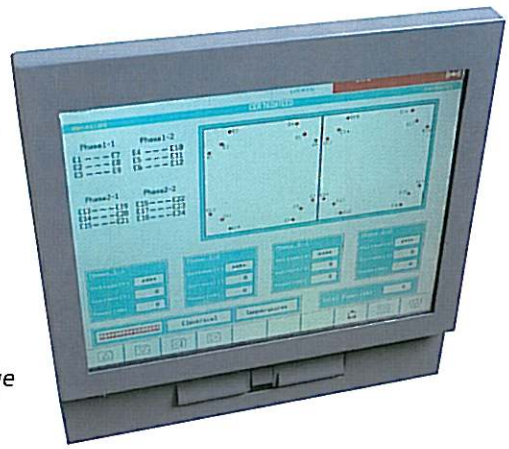
Rely on an Electrode Maintenance Unit for total electrode monitoring and maintenance

FIC takes the lead in furnace technology with its unique EMU: Electrode Maintenance Unit.

Undetected electrode wear or breakage will lead to serious refractory erosion and possible glass leaks, thus shortening furnace life if not properly addressed.

A radical advance on the standard breakage and wear detector, the EMU continuously monitors and displays the state of individual electrode wear even on multiple electrodes-per-pole systems and ensures that electrodes are re-set to their datum levels prior to a general overall push.

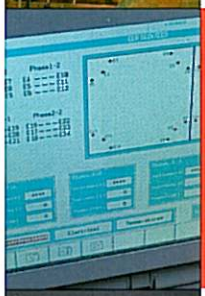
- *Ensures optimum electrode maintenance.*
- *Greater furnace reliability.*
- *Most electro-heat specialists are unable to do what FIC's EMU does: accurately determine wear on multiple electrodes connected to the same pole.*
- *Alarmed to alert operators of electrode problems.*
- *Monitors electrode holder temperatures, water-flow, voltage and current parameters.*
- *Touch-screen technology gives rapid user access to each monitoring mode.*
- *Clear system graphics.*
- *Increases electrode and holder life.*



- Design and Build
- Electric Furnaces
- Electro Boost
- High Q Holders
- Electrode Holders
- HVP Forehearth
- Iso-Thermal Unit
- Bubbler Systems
- **Electrode Maintenance Unit**
- Drains
- Mathematical Modelling
- Engineering Services

The World's **Number One** in Furnace Technology





Rely on an Electrode Maintenance Unit for total electrode monitoring and maintenance

Until the introduction of FIC's advanced EMU in June 2001, those in the glass industry were offered only breakage and wear detectors with varying degrees of reliability. These were unable to accurately determine the precise wear of multiple electrodes per pole because multiple electrodes connected to the same side of the transformer winding could only detect the same voltage.

Because electrode wear is not always uniform across the same circuit, simple measurements such as determining the change in resistance were found to be inaccurate and unsatisfactory. Similarly, probes used to measure relative voltage across the system can only average out the effect of wear on the multi-electrode poles. Such inaccuracy can lead to the over-insertion of the electrode and the consequent increased probability of breakage. Conversely, under-insertion of the electrode can lead to increased current density close to the side-wall and hence the accelerated wear of the refractory.

New technology has allowed FIC to integrate their EWD: Electrode Wear Detector, EBD: Electrode Breakage Detector and EBC, Electrode Balance Computer into the EMU to produce a hybrid, state-of-the-art unit which allows an in-campaign monitoring of electrodes to include breakage detection, balancing and wear calculation.

Taking advantage of flash memory, it keeps a continuous record of the electrode volts and amps and is fully alarmed to alert personnel of any problems detected with the electrodes.

EMU also monitors the electrode holder temperature which ensures that heat-stress on the holder is not increased to the point where it is getting increasingly closer to the glass. In the event of this happening, the holder could fail, resulting in the loss of glass and putting at risk the life of the furnace.

It also monitors water-flow to the holder and alerts the operator to any failure.

Touch screen technology permits simple access to each instrument mode whilst user-friendly software ensures ease of use with free format displays, alarm-listing, on-line help and user-friendly graphics, including mimic, as standard features. In addition, options can be specified to allow regular trending and data dumps to the client's SCADA system, to floppy disc or both.

Pyrofil unit

Thermocouple signal filter unit.

Advanced state-of-the-art instruments for all electric glass melting furnaces and boosters.

FIC also offers the Pyrofil Unit which eliminates AC pick-up voltages from thermocouples, provides 800V RMS input/output isolation and prevents damage to downstream instrumentation.

A sure way to make sure that process integrity is maintained, the Pyrofil Unit also eliminates signal off-set errors.

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