DRY KILN INSTRUMENTATION

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We have brought two instruments for display. The black instrument was built 33 years ago and can be compared with the hammertone green instrument being assembled in 1969.

We have made many refinements over the years but have been reluctant to do away with the simplicity that has given us a reputation among the dry kiln operators. The quote of many operators - "We like the Moore instrument because we have less trouble and it is simple enough so we can isolate our trouble, and replacement parts are simple".

We have not allowed extreme new ideas of control to enter the picture unless the same part could be installed in any of the Moore recorder controllers built in the last 33 years. The exception to this is changing manual control

instruments to pre-determined automatic schedule control.

Our air guage - filter - air valves - reverse relay - pen arms - pen points and also clocks - door glass have remained interchangeable with any of the Moore recorder controllers manufactured in the previous years.

Our first supplier of air guages quit the business and changing times and prices have taken toll of spring wound clocks.

The finish of the instrument has changed many times - black lacquer - black wrinkle - green wrinkle and now green hammertone. The same rectangular case lends better to installation of the same component parts, such as 1 system 2 guages, 2 systems 3 or 4 guages, 3 systems 5 gauges. Thus trying to keep down the tremendous inventory of parts. Most machining of parts has to be on the basis of 6 months or a year's supply.

Color coding of systems, air lines - guage and index setting has been in effect for 31 years.

Continuous flow pen point requires too much patience and ingenuity to operate properly and so this has been abandoned. Capillary action of these pens depended on pressure on chart-ink level - and even a little oil from finger on the pen point tip would break the ink seal on chart and allow air bubbles to back up in styles and plastic tube, to say nothing of messy leakage of ink supply.

TROUBLE SHOOTING

Failure of filled system will allow control to stay on, such as heat or spray. Failure of reverse relay by being out of adjustment or bellows failure will allow ventilators to stay open. Now even ventilators are opened by air pressure on motor lever and in case of failure of air compressure or some disaster - such as fire - where electricity fails, the ventilators are closed to close off draft.

The most commonly used #3 air valves with control of the indicating air guage to the diaphragm valve within $1/2^{\circ}$ on chart. Any additional fluction of the recording pen on the chart is giving a true temperature change within the kiln. This is caused by many factors beyond function of instrument. Heat storage caused by leaking diaphragm valve, outside weather conditions, the area of the chart the control is operating at. Since kilns are desired and designed to have sufficient heat while weather outside is very cold in winter this can backfire in summertime and a small surge of steam can cause heat storage beyond demand of instrument. If the heat air guage pointer reads O pounds the instrument has proper control. Any increase in pen reading is a warning of trouble beyond the instrument.

The #10 air valve is interchangeable, with #3 and will give about double the modulation control for On and Off diaphragm valves and further modulating control is acquired by using throttling type diaphragm valves.

Leaking steam from heating coils and excessive steam spray can be another cource of heating beyond index setting. Abuse of linkage hook-up of motor lever lids or covers are beyond the control of the instrument. A leading edge opening of 1/2 the width of the ventilator opening is a quick rule of judgment and sometimes some grease can reduce friction.

Abuse of wet bulb wick and some times too much cold water to water box have caused out of control conditions.

Improper charts installed by accident have been a source of control problems.

Isolating air control trouble by a process of elimination. First, the instrument air lines and diaphragm valve.

Notes of shop practice on checking control of instrument. Index dial pointers are read at the time to control pointer reads 10 pounds.

Protection of flexible on capillary tubing at wall opening. Acids concentrate by evaporation of water if opening is not closed with some soft putty.

The maintenance of air compressors are sometimes neglected. However, oil and condensate water are not too much of a problem. These elements seem to bubble right through and the instrument keeps on operating, unless in case of a shutdown for a period of time. Water freezing in airlines can cause a blockage of air passage.

There will be further demonstration of detecting and isolating of trouble on the demonstration instrument. Discussion on care of pressure recorders and controllers in case of shutdown in extreme cold weather.

Further discussion of any questions from the Kiln Club.