

XIII. AUTOMATIC CONTROLLING EQUIPMENT

1) Electrical Regulators

Recently, the demand for pneumatic type regulator has increased and surpassed the bridge relay. The bridge relay manufactured by our Company, however, is highly appreciated in various circles for control equipment such as A.C.C. and others.

Among the newly developed types, there is NZ regulator. This new type regulator is small in size, and is replacing the existing large chopper bar type regulator. Moreover, since it can be utilized for several purposes by changing the combination of the moving plate, there is a very large demand for it as ON-OFF regulator and has become the typical type of the electrical regulators. For electrical Regulating unit, two models of Damper driving mechanism of 10 mKg and 50 mKg have been completed.

2) Pneumatic Regulators

In Japan, due to sudden increase of the general demand for pneumatic regulators, our Company during the past two years has developed various pneumatic regulators in all their phases. Besides the indicator or recording regulator for temperature, pressure and flow, regulators such as automatic balance indicating or recording regulator, float type liquid level regulator and displacement type liquid level regulator were developed. These regulators utilize the expansion of mercury for detecting temperature, bellows and Bourdon tube for low and high temperatures respectively and mercury U tube for flow.

Moreover, an electro-pneumatic regulator in which detection is made electrically and regulation

obtained pneumatically has been developed. This equipment uses the null principle of the bridge and has a very high measuring sensitivity. Special features of both the pneumatic and PID operated types have been introduced into this regulator. Moreover, control is continuous and has been supplied in large numbers to various districts for use in chemical, iron and steel industries. The regulator does not record the indications and is exclusively used as a regulating device.

For the regulating unit, standard designs of materials and size of diaphragm-valves have been completed and large amounts have already been delivered to various districts. For uses in which a greater operating torque is required, power cylinders and diaphragm motors of 15 mKg and 50 mKg have been manufactured. Complete sets of accessories such as various types of controlling means and pressures relays have been prepared and utmost effort is being exerted for the perfection of complete unit of pneumatic type automatic regulator.

3) Automatic Combustion Control Equipment

Many electric type of automatic combustion control equipment for use with stoker and pulverized coal boiler have been supplied to the users up to the present. However, recently, increase in the demand for a pneumatic type has become more and more noticeable. As for example, for the 3 boiler at Nippon Sada Co.'s Nihongi Factory in which the pulverized coal is burnt together with crude oil, a pneumatic type automatic combustion control equipment has been attached. In this equipment, graphic panel shown in Fig. XIII.4 was installed so

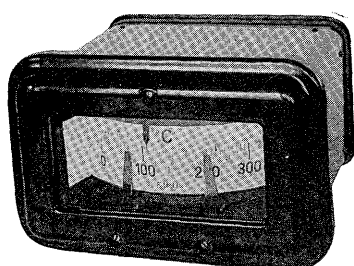


Fig. XIII.1. NZ Regulator

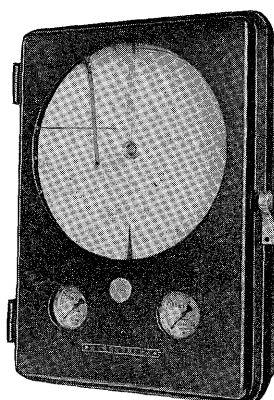


Fig. XIII.2.
Pneumatic Pressure Regulator
Type PDSR

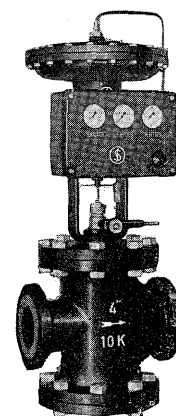


Fig. XIII.3.
Diaphragm Valve
with Positionner

that the overall operational condition can be closely watched. Similar type of graphic panel for automatic combustion control equipment was also installed at Chichibu Cement Company's high temperature, high pressure pulverized coal boiler.

Installing of the automatic combustion control equipment consisting of Siemens products and our Company's for the two Benson boilers at Asahi Glass Co's Makiyama Factory was planned and at the end of 1955 the necessary adjustments were completed and is in operation at present. The principle parts of this equipment is composed of electrical instruments and in some parts magnetic regulators are used.

4) Automatic Controlling Equipment

To keep up with the progress in automation, our Company has been supplying a large number of electrical and pneumatic types of automatic control devices to various districts. Four electric and pneumatic types of automatic control equipment have already been installed and operating at Yawata Steel Mill's Salking pits and the installation of this equipment has resulted in improving the quality of the bloom.

Also, at Fujikawa Paper Mill and Mishima Paper Mill, in order to control the temperature of the drier in the paper manufacturing machines, the surface temperature of the roller is detected with a radiation pyrometer and this temperature indication is utilized to operate a pneumatic type self balance type recording controller and regulate the steam for heating the roller. As the result of using this equipment, uniform drying was obtained and greatly

reduced the occurrence of breakage in the paper during the drying process, thus improving the working efficiency.

Next, the automatic controlling equipment for the low pressure distillation tower of crude oil at Toa Petroleum Co. was our Company's most newly installed equipment in petroleum industry and consists of recently manufactured differential pressure converter, displacement type liquid level controller, etc. and graphic panel equipped with PT type small size pressure gauges, DT and QT type small size indicators, etc. The whole unit is functioning satisfactorily and at present the Company is planning for additional installation.

The automatic controlling equipment for temperature, pressure, liquid level, and flow, which was delivered to Ube Kosan Co. to be installed on the machine for the manufacture of caprolactam comprises mainly of pneumatic type automatic controlling device and is the largest of the automatic controlling equipment manufactured by our Company. The majority of the various instruments comprising this whole unit was manufactured by our Company, the remainder being supplied by other manufacturers. The entire panel board on which the above instruments were installed was manufactured in bloc by our Company and the fact that this panel board consists of 70 individual panels shows that this production was accomplished on a very large scale. The planning for the second stage of installation is practically the same as the first and the order was received in March 1956 and at present, all equipment have already been manufactured and delivered. And now the order of third stage of installation was received.

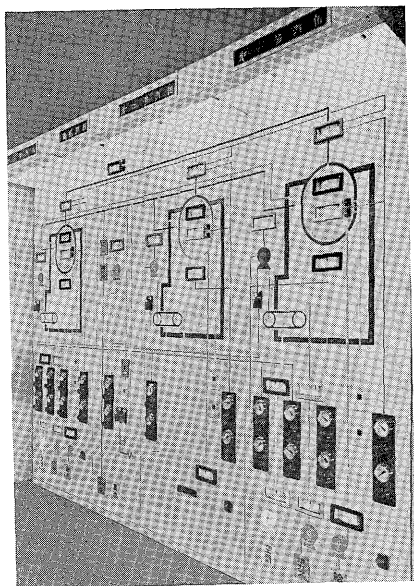


Fig. XIII-4. Graphic Panel for A.C.C.

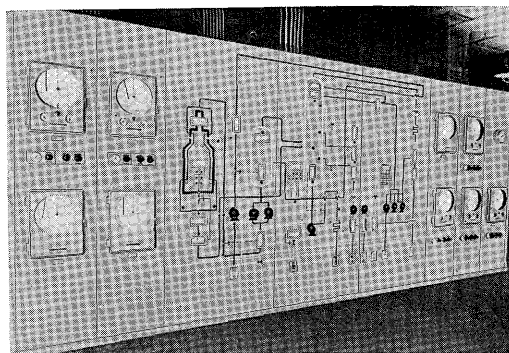


Fig. XIII-5. Graphic Panel for Petroleum Plant