SEMITRONIK

DYEING PROGRAMME CONTROLLER

FOR

- DYEING TEMPERATURE CYCLE CONTROL
- FULLY AUTOMATIC OPERATION
- EXHAUSTION RATE CONTROL
- DE-WEIGHING WEIGHT/DENIER REDUCTION % CONTROL

DYEING PROGRAMME CONTROLLER

MICROPROCESSOR PROGRAMME CONTROLLER FOR DYEING MACHINE

Demand for increased output from dyeing machinery and achieving of optimum quality but at same time reduction in production costs in order to meet difficulties in the current market situation.
It has led in a very large way, to the introduction of automation in dyeing process to carry out process most economically. Alongside reliability in processing, the time factor also plays important role. The shorter the dyeing operation, the more viable it is.

The SEMITRONIK MICROPROCESSOR TEMPERATURE PROGRAMMER Model PC-100 series optimises every dyeing process by means of individual control.

SEMITRONIK Temperature Programmer PC-100 series can dye as fast as possible, but also as slowly as required.

UNIQUE INTRODUCTION TOWARDS COMPLETE AUTOMATION AND CENTRALISED CONTROL

The new control system entail a **number of economic advantages** for the textile dyeing industry.

- It optimises dyeing time and energy.
- Production capacity is increased.
- It eliminates uneven dyeing and complaints.
- It increases the reliability in production.
- Eliminates manual error.
- Reduces manual labour to great extent. 2/3 dyeing machine can be operated by one operator.
- Dyeing process is rationalized.

PANEL WITH TEMPERATURE PROGRAMMER MODEL PC-400 FOR FULLY AUTOMATIC OPERATION OF ANY DYEING MACHINE

- Ensure total automatic operation in between loading and unloading of dyeing machine such as:
  - Top/fiber/yarn dyeing.
  - Hank dyeing.
  - Jet dyeing/winch dyeing/overflow dyeing.
  - Jigger dyeing.

Reliability in operation and perfect reproduction of the dyeing cycles are ensured by several interlocks and alarm devices. These devices indicate any error or omission of maneuvers, alerts on :

- Insufficient supply of heating or cooling medium.
- Hold time or dyeing cycles.

SPECIAL FEATURES

- Provision to store data on failure of power supply.
- CONTROL MODE SELECTION :
  - On/off/proportionate/4-20 mA (optional).

FACILITY PROVIDED

- To retard or advance the programme.
- To programme total 99 programme of 16/30 steps.
- To hook-up :
  - Supervisory computer.
  - Dosing system.
  - Weighing terminal or automatic feeding of chemicals, dyestuff and auxiliaries directly from storage tank
- To add one or more steps anywhere during programme without interfering the original programme stored in memory.
- To select automatically heating or cooling in case if actual temperature is higher or less than desired.
- Supervisory computer communication for programming, scheduling, reporting etc.
- A terminal connection is also an added feature as it offers the ability of central supervision, programming and data-logging of all connected units. Further more, efficiency reports can be elaborate, either individually for each unit or for all units at the same time.
- Signals for machine operator and dye kitchen personnel.

ALARM OPERATION IN CASE OF

- Failure of liquid circulation pump during hold time with provision to stop heating or cooling until the moment pump is re-started hold time period will continue and heating and cooling will be re-started.
- When actual temperature is lower than minimum set temperature or sensor PT-100 is short circuited programme also stops and displays 'OP' specifying an open PT-100.
- When actual temperature is higher than maximum set temperature or sensor PT-100 is open circuited. Programme also stop.

DIGITAL DISPLAY FOR

- Actual temperature.
- Desired temperature.
- Gradient.
- Hold time.
- Total time.
- Programme number.
- Step number.
- Forward/reverse time etc.

CONTROL FOR

- Chemical and dye transfers from local or remote tanks.
- Recovery tank control.
- Blended water temperature.
- Pressure or differential pressure control.
- Jigger ends or passes.
- Selection of dosing control of liquid or solid chemicals.
- Lot, shed, quality to be dyed.
- Number of cone/cheese to be loaded and loading time.
- pH during scouring, bleaching, dyeing and washing cycles.
- Weight/denier reduction control system for dyeing machine.
  The system is with on line digital indication of :
  A) WEIGHT/DENIER REDUCTION %.
  B) CONCENTRATION OF SODIUM HYDROXIDE.

FACILITY AVAILABLE

- Interface PCB with software package to obtain graphical print-out of :
  - Entire bleaching, scouring, dyeing and washing cycles.
  - Data deviation.
  - For group of dyeing machines.

Normally, if dyeing result is not okay, it is known after fabric is unloaded and dried. For necessary correction again same has to be loaded on the dyeing machine, correction has to be carried out and again to be unloaded and dried.
This additional loading, drying and unloading process can be avoided, as deviation due to which lot has gone out can be known and corrective action can be taken on line only.

Thus installation of system :

- INCREASES THE PRODUCTION.
- REDUCES PRODUCTION COST.
- ELIMINATES MANUAL ERROR AND MANUAL LABOUR.
- REDUCES CONSUMPTION OF DYESTUFF, CHEMICALS AND AUXILIARIES.

Model PC-100

- **MODEL PC-10**
  For control of heating / cooling, pressurisation & de-pressurisation.
  (Programme storing capacity : 60 programme of 16 steps)
  Dimensions : 96 x 96 x 175 mm
  Net Weight : 3 kg.
  Gross Weight : 6 kg.
- **MODEL PC-100**
  For programming & controlling heating / cooling / pressurisation & de-pressurisation suitable for H.T.H.P. dyeing machines.
  (Programme storing capacity : 75 programme of 99 steps)
  Dimensions : 96 x 190 x 235 mm
  Net Weight : 7 kg.
  Gross Weight : 15 kg.
- **MODEL PC-100 A**
  For automatic operation of jet dyeing machine (atmospheric) for heating / cooling, fill & drain.
  (Programme storing capacity : 75 programme of 99 steps)
  Dimensions : 96 x 190 x 235 mm
  Net Weight : 7 kg.
  Gross Weight : 15 kg.
- **MODEL PC-100 B**
  For control of heating / cooling, pressurisation & de-pressurisation and forward / reverse operation of yarn dyeing machine or beam dyeing machine.
  (Programme storing capacity : 75 programme of 99 steps)
  Dimensions : 96 x 190 x 235 mm
  Net Weight : 7 kg.
  Gross Weight : 15 kg.
- **TEMPERATURE PROGRAMMER PC-100 R**
  With additional facility to programme RPM of main pump of dyeing machine for scouring / bleaching and washing cycle at low RPM and full RPM, while dyeing cycle to save electrical energy to extent of 35/40 %.
- **MODEL PC-100 PLC**
  For programming & controlling heating / cooling, pressurisation & de-pressurisation suitable for H.T.H.P. dyeing machines such as beam / jet / top / fibre / yarn dyeing machine with facility to hook-up existing logic controller of for fully automatic operation.
  (Logic controller - optional)
  (Programme storing capacity : 75 programme of 99 steps)
  Dimensions : 96 x 190 x 235 mm
  Net Weight : 7 kg.
  Gross Weight : 15 kg.
- **MODEL PC-100 D**
  System same as Model PC-100 PLC but with programmable dosing facility for linear / progressive / regressive dosing.
- **MODEL PC-400**
  For programming facility for heating / cooling / pressurisation & de-pressurisation fill & drain of dyeing machine with expansion tank or colour tank for automatic operation of pump, motors and level controls.
  For machine equipped with all automated valves & level controllers, i.e. direct replacement of any fully automatic programmer of any make.
  (Programme storing capacity : 50 programme of 75 steps).
  Dimensions : 180 x 340 x 280 mm
  Net Weight : 18 kg.
  Gross Weight : 40 kg.
- **MODEL PC-400 D**
  System same as above but with programmable dosing facility for linear / progressive / regressive dosing.
- **MODEL PC-1000**
  - Windows based user interface for all the operations.
  - PLC software with in-built instruction list.
    A) PLC programming for easy & fast output operation.
    B) Pre-defined PLC software instruction set screen.
  - Mimic diagram of on-line process
  - On-line graphical & textual display on colour monitor screen with details of currently running lot.
  - Textual report with detailed information for :
    A) Time.
    B) Reference & actual temperature.
    C) Rate of rise.
    D) Hold time.
    E) Relay status of all main input & outputs of past processed lots.
  - Control of time, temperature, pressure, dosing, etc.
  - Can control all types of dyeing process like :
    Fibre/top/yarn dyeing or jet / overflow or winch or jigger dyeing machines
  - RS485 serial interface provided :
    - To connect one or multiple such machine to a PC through the software.
  - Additional facility such as :
    - Status monitoring
    - Programme entry
    - Scheduling
    - Report generation & summary

  Dimensions : 800 x 600 x 500 mm
  Net Weight : 35 kg.
  Gross Weight : 70 kg.
- **MODEL PC-1000 D**
  System same as above but with programmable facility for linear / progressive / regressive dosing.
- **MODEL EDS-300**
  Dosing programmer for programmable facility for linear / progressive / regressive dosing.
  Dimensions : 96 x 190 x 235 mm
  Net Weight : 7 kg.
  Gross Weight : 15 kg.
- **MODEL PDS-500**
  Portable system with microprocessors, dosing pump and control valves with dosing tank (400 ltr.) mounted on trolley etc.
- **MODEL ERC-601**
  Suitable for monitoring and controlling rate of exhaustion of disperse dyes.

Model EDS-300

- **MODEL ERC-602**
  System same as above but with facility to programme temperature cycle for scouring / bleaching and washing cycle of dyeing machine.
- **MODEL MDS-600**
  Multi-channel programmable liquid dispensing system with interface with SEMITRONIK PROGRAMMER series PC-100 & RS 232 or 485.
  Programme storing capacity : 75 programme of 99 steps.
  Dimensions : 96 x 190 x 235 mm
- **MODEL AVD-102**
  Microprocessor for jigger machine for:
  - Automatic forward/reverse operation.
  - No. of cycle control.

  Dimensions : 378 x 180 x 280 mm
- **MODEL AVD-105**
  Microprocessor for jigger machine for fully automatic operation between loading and unloading-right from feeding of fabric with required length, addition of water, control of temperature, feeding of chemical, colour addition, drain operation etc.
  Dimensions : 378 x 180 x 280 mm

REVOLUTIONARY INTRODUCTION TOWARDS POSITIVE CONTROL OF :

- Dye exhaustion rate for any type of dyeing machine to optimize :
  - Dyeing time
  - Dyeing cost
  - Energy consumption
  - Consumption of :
    - Dye stuff
    - Auxiliaries
    - Chemicals :

  Saving to the tune of 30 %
  - Total elimination of :
    - Re-dyeing.
    - Manual labour.
  - Repeatable dyeing results.

ACCESSORIES

- Electro-pneumatic flow control valves in different size for various capacity dyeing machine.
  - Pneumatically operated diaphragm control valve.
  - Cylinder operated valve.
  - Ball valve with pneumatic actuator.
- Pneumatic accessories such as:
  - Pressure gauge.
  - Pressure regulator.
  - Air filter.
  - Lubricator.
  - Nipples.
  - Nylon tubing etc.
  - Solonoid valves 3 pot,5 pot etc.
  - Temperature measurement by platinum resistant bulb PT100 housed in S.S. capillary available in different size :
    12 mm dia. with 30 mm or 150 mm length and 1/2" or 3/4" BSP coupling / thread (single or dual) supplied as per specific requirement.

FABRIC FLOW MONITORING SYSTEM FOR JET DYEING MACHINE

For any jet dyeing machine for excellent repeatable dyeing result not only the **time** and **temperature** are important factor but circulation of **liquor and fabric** is also very very important and particularly for

- Light weight material where fabric to be dyed is comparatively very large in length being light weight fabric.
- High weight fabric like suiting, it is very important to see the fabric circulation is also to the required extent to maintain these,
  FABRIC FLOW MONITORING SYSTEM IS A MUST.

The system indicates loop time and number of cycle with pre-set arrangement and facility for **AUTOMATIC SEAM DETECTION** by emerge processing technique : 1st time in the world introduced by SEMITRONIK.

- **FMS-100**
  Fabric Flow Monitoring System to monitor the flow of fabric and to alarm entanglement.
- **FMS-100C**
  Fabric Flow Monitoring System to monitor and control the flow of fabric with control output to operate anti-entanglement system with loop time & number of cycle control.

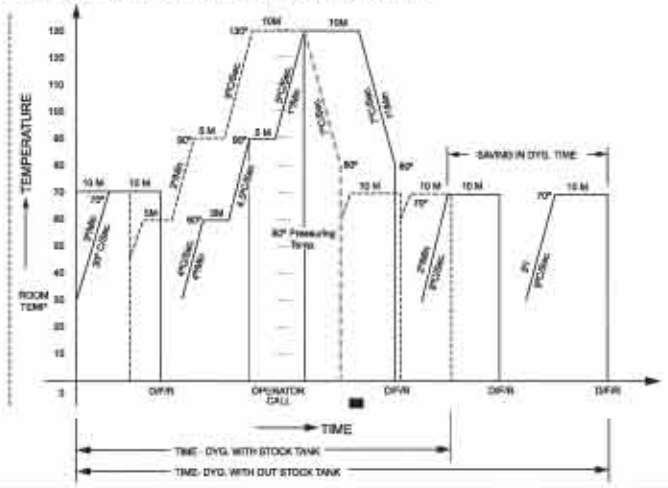
SOFTWARE PACKAGE OVERVIEW OF PROCESS

- Process computer features include status monitoring, program and status data storage, machine control, report generation for upto 32 machines.
- STATUS MONITORING
  - Status monitoring can be made in different styles.
  - Textual display/Visual status display : Detailed information for 16 machines at a time, and relay, valve, level control status for selected machine.
  - Graphical display : Time vs. temperature graph for a machine on lot or time basis.
- MACHINE CONTROL
  - Machine parameters such as lots to be processed on machine, status of machine, details of dyeing programs can be defined.
  - Dyeing programs can be started on machine, mirror images of these information is stored on disk for efficient data management.
- REPORT GENERATION
  User defined reports for machine status data can be generated on lot and time basis, program details for one or group of programs can be prepared for machine.
  Reports can be seen, saved to file or printed without losing a minute of data (Real-time activity).
  - Lot history - Textual and graphical.
  - Machine track report - Textual and graphical.
  - Program details report.
  - Energy consumption report.

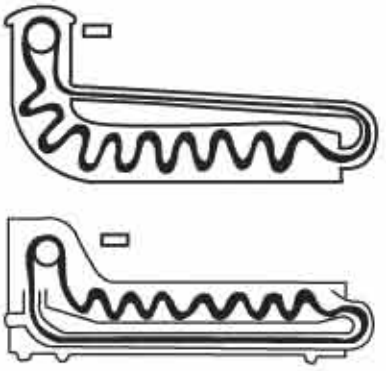
Most importantly, all data files can be exported to data processing softwares for EDP/MIS department.
Most useful for detailed analysis, especially when performance measurement criteria keeps varying.

Model AVD-102

HOW PRODUCTION CAN BE INCREASED WITH DYEING MACHINE WITH STOCL TANK
All programmers are having facility to programme process cycles for Bleaching, Scouring, Dyeing and Washing as shown:



INSTALLATION OF SENSOR ON ANY TYPE & ANY MAKE OF JET DYEING MACHINE



NON CONTACT FABRIC FLOW MONITORING SENSOR

For further details, contact

SEMITRONIK

Since our policy is of continuous development and improvement, we reserve the right to supply product which may differ from those illustrated & described in this publication.

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