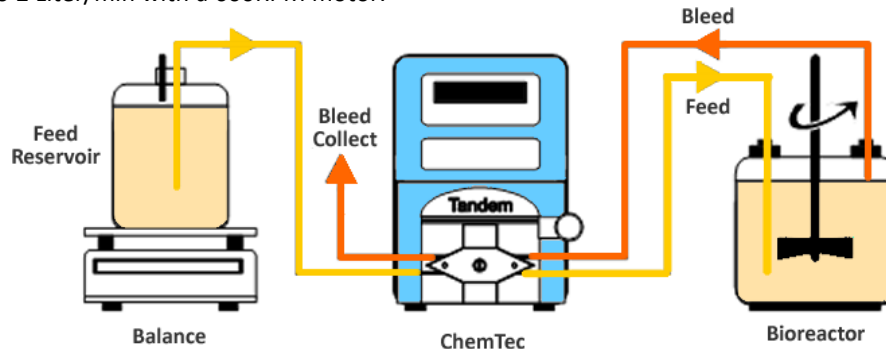


## Automated Linear & Exponential Bioreactor Feeds

### SUMMARY:

The SciLog ChemTec™ Smart Pump interfaces directly with an OHAUS® balance to provide precise, automated mass-flow control of nutrients into bioreactors and fermenters. The ChemTec can be programmed for unattended pump operations during weekends and off-hours. The ChemTec mounted with a TANDEM peristaltic pump head provides programmable rates from 0.02 gm/min with an 8RPM motor up to 2 Liter/min with a 600RPM motor.



### FEATURES:

The SciLog ChemTec pump provides programmable automated bioreactor feed either by volume or weight. By connecting to an electronic scale, the ChemTec offers automated mass-flow metering in grams/minute of your nutrient solutions. In contrast to volumetric metering, the ChemTec mass-flow delivery of nutrients is not affected by temperature, viscosity changes or pump tube wear. When hooked up to a scale, the ChemTec becomes a self-calibrating metering system.

All pump data and alarms can be printed out or sent to a PC for archiving at user-defined time intervals. By using SciLog's SciDoc package, this data is automatically collected in a custom Excel® Spreadsheet. The ChemTec can be programmed for unattended operations during weekends and off-hours. At user defined time intervals, the ChemTec will automatically turn On, Off or change feed rates. User programmable alarms can be used to monitor mass-flow rate, cumulative nutrient weight and program completion. During an alarm, the ChemTec stops the pump and/or provides an auditory alarm depending on the selected alarm options.

The nutrient addition rates can be automatically changed on a user-defined time schedule to increase, decrease or to remain constant. Linear or exponential feed gradients can be readily implemented, see back of page for a program example. This feature of the ChemTec allows you to generate the optimal *nutrient concentration vs. time* profile that will meet your specific requirements.

### ADVANTAGES:

- Scheduling of pump operations during off-hours
- Automated flow control at a modest price
- Time-programmable nutrient addition rates
- Optimal nutrient versus time concentration profile
- Simultaneous feeding and bleeding of bioreactors

**OVER**

## SAMPLE PROGRAM:

A typical ChemTec user-program for controlling pump functions is shown below. All program statements are easily entered from the ChemTec front panel. Alternatively, lengthy and more complex user-programs can be prepared and stored in Note Pad on your PC and uploaded to the ChemTec from the Hyperterminal (Start: Accessories: Communication: Hyperterminal) of your PC. The following exponential feed program is entered into **EDIT** of the Mass Flow mode:

000	<b>START</b>	Start of Program
001	<b>CW</b>	Pump direction: Clockwise
002	<b>RUN</b>	Pump motor is turned On.
003	<b>RATE=0.37g/m</b>	Starting pump rate = 0.37g/m
004	<b>INTP=0.50g/m</b>	Pump ramps from 0.37 to 0.50 g/m,
005	<b>TIME=12:00</b>	over a 12 hr time interval
006	<b>INTP=0.69g/m</b>	Pump ramps from 0.50 to 0.69 g/m
007	<b>TIME=12:00</b>	over the second 12 hr time interval
008	<b>INTP=0.94g/m</b>	Pump ramps from 0.69 to 0.94 g/m
009	<b>TIME=12:00</b>	over the third 12 hr time interval
010	<b>STOP</b>	Pump motor stops
011	<b>COUNT=1</b>	Pump program cycles
012	<b>END</b>	End of Program

**Note:** Use the \* (Star) key of the ChemTec to access the **INTP** (Interpolation) function

When executing the above program, the ChemTec will have a starting pump rate of 0.37 g/min and ramps up to 0.50 g/min during the first 12-hour interval. During the second 12-hour interval, the pump rate is ramped from 0.50 to 0.69 g/min. In the third, 12-hour interval, the pump rate is ramped from 0.69 to 0.94 g/min.

For demonstration purposes change **TIME = 12:00** (twelve hours) to **TIME = 00:01** (one minute)

## ORDERING INFORMATION: SciLog Customer Service: 1-800-955-1993

### Catalog # Description:

- 100-138MASS**      **ChemTec CP-120 Smart Metering Pump:** comes with a 160-RPM motor and a **1081 TANDEM** peristaltic pump head; accommodates thin-walled (1/16" wall thickness) **Masterflex pump tube sizes: #13** (0.4 to 9.0 ml/min), **#14** (1.4 to 34 ml/min), **#16** (4 to 120ml/min), **#17** (14 to 410ml/min), and **#25** (10 to 240 ml/min).
- 100-138MASS-8**      **ChemTec CP-8, Smart Metering Pump comes with an 8-RPM motor,** and a 1081 TANDEM peristaltic pump head; accommodates thin-walled (1/16" wall thickness) **Masterflex pump tube sizes: #13** (0.01 to 0.5 ml/min), **#14** (0.1 to 2.0 ml/min), **#16** (0.2 to 6.0 ml/min), **#17** (0.7 to 20 ml/min), and **#25** (0.5 to 13 ml/min)
- 100- SPE060**      **Mettler-Toledo "SpeedWeigh" Top-loading Scale,** max 60 kg capacity, 6 gram resolution, Platform 12"x12", SS washdown construction. Includes Display Module and a SciLog RS-232 cable for hook-up with SciPro. Tested with SciPro prior to shipment. **Note:** Contact SciLog for additional scale with larger capacities.
- 080- 095A**      **Printer Kit,** interfaces with ChemTec, documents your process.
- 080-099CHEM**      **SciDoc for ChemTec,** Documentation Software for ChemTec Data with customized Excel<sup>®</sup> Spreadsheet.

**Other Pump Head / Balance combinations are available, Contact SciLog with your needs.**