

Section 1: Theory Guide

Introduction

The *Kodak X-Omat* 1000, 1000A and 1000J PROCESSORS are automatic PROCESSORS. The PROCESSORS are easy to operate and maintain.

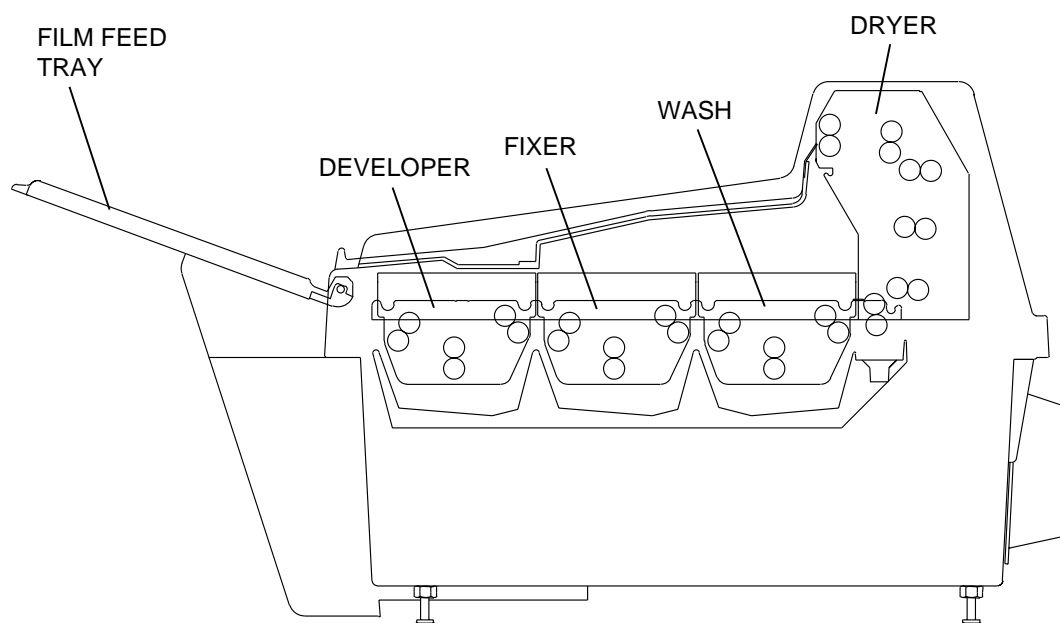
- The *Kodak X-Omat* 1000 PROCESSOR uses 220, 230 or 240 volt, 50/60 Hz AC power.
- The *Kodak X-Omat* 1000A PROCESSOR uses 120 volt, 50/60 Hz AC power.
- The *Kodak X-Omat* 1000J PROCESSOR uses 100 volt, 50/60 Hz AC power.

Film Processing and PROCESSOR Functions

Film Processing Step	PROCESSOR Section	PROCESSOR Component Descriptions and Functions
Developing: The developer solution changes the latent image on the film into a visible image.	DEVELOPER	<ul style="list-style-type: none"> • DEVELOPER TANK - holds the developer solution. • DEVELOPER RACK - has GEARS and ROLLERS to move the film through the developer solution. An EVAPORATION COVER prevents oxidation of developer solution. • DEVELOPER HEATER - heats the developer solution to the setpoint temperature. • DEVELOPER RECIRCULATION PUMP - continually moves the developer solution through the DEVELOPER TANK. • DEVELOPER REPLENISHMENT PUMP - adds new developer solution to the DEVELOPER TANK from outside the PROCESSOR as the solution is used in developing film. • A CROSSOVER RACK moves film from the DEVELOPER RACK to the FIXER RACK.
Fixing: The fixer solution stops the continued development of the visible image and removes unexposed silver halide crystals from the film.	FIXER	<ul style="list-style-type: none"> • FIXER TANK - holds the fixer solution. • FIXER RACK - has GEARS and ROLLERS to move the film through the fixer solution. • FIXER RECIRCULATION PUMP - continually moves the fixer solution through the FIXER TANK. • FIXER REPLENISHMENT PUMP - adds new fixer solution to the FIXER TANK from outside the PROCESSOR as the solution is used. • A CROSSOVER RACK moves film from the FIXER RACK to the WASH RACK.

Film Processing Step	PROCESSOR Section	PROCESSOR Component Descriptions and Functions
Washing: Wash water rinses both developer and fixer solutions from the film.	WASH	<ul style="list-style-type: none"> WASH TANK - holds the wash water. WASH RACK - has GEARS and ROLLERS to move the film through the wash water. WATER SOLENOID - controls the flow of wash water to the WASH TANK from outside the PROCESSOR.
Drying: The film is dried so it can be handled.	DRYER	<ul style="list-style-type: none"> DRYER RACK - has ROLLERS, GEARS and a DRIVE CHAIN to move the film through the DRYER. DRYER HEATER - heats the air to the set•point temperature. DRYER BLOWER - moves air through the HEATER and the DRYER RACK.

The X-Omat 1000PROCESSOR



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PROCESSOR Components

Temperature Controls

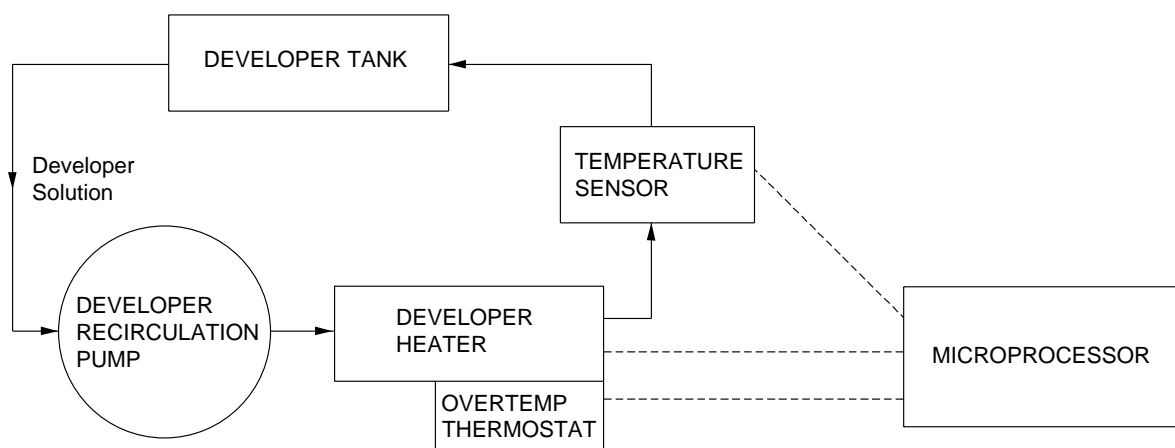
There are 2 separate temperature control systems in the PROCESSOR, the DEVELOPER HEATER system and the DRYER HEATER system.

DEVELOPER HEATER System

The developer set•point temperature is adjusted by service personnel only. The DEVELOPER HEATER system has the following components:

- RECIRCULATION PUMP
- DEVELOPER HEATER

- THERMOSTAT
- DEVELOPER TEMPERATURE SENSOR

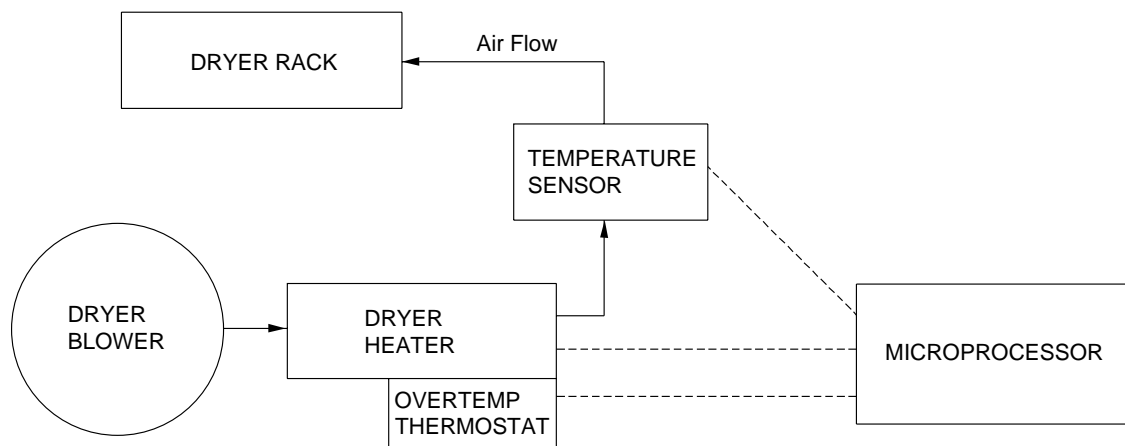


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DRYER HEATER System

The DRYER setpoint temperature can be adjusted by the operator using the DRYER TEMPERATURE CONTROL KNOB on the front of the PROCESSOR. The DRYER HEATER system has the following components:

- DRYER BLOWER
- DRYER HEATER
- THERMOSTAT
- DRYER TEMPERATURE SENSOR



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Drive System

The drive system in the PROCESSOR drives the GEARS and ROLLERS in the RACKS to move film from the FILM TRAY through the PROCESSOR to the TOP COVER at a constant speed. The drive system has the following components:

- DRIVE MOTOR - has a HELICAL GEAR which engages the DRIVE SHAFT.
- DRIVE SHAFT - has a DRIVE GEAR which engages the HELICAL GEAR on the DRIVE MOTOR and WORM GEARS which engage the GEARS on the RACKS.

Replenishment Systems

The replenishment system adds new developer and fixer solution to the TANKS as the solutions are used when processing film. REPLENISHMENT PUMPS move solutions to the TANKS from outside the PROCESSOR. The replenishment system operates automatically when film is fed into the PROCESSOR, or the operator can press the "Dev" or "Fix" BUTTONS which manually starts one replenishment cycle of that system. The replenishment rates are adjusted by service personnel only.

The PROCESSOR uses a WATER SOLENIOD VALVE to control the flow of wash water to the WASH TANK from outside the PROCESSOR. The SOLENOID VALVE operates automatically when film is fed into the PROCESSOR.

Vent System

A VENTILATION FAN provides air flow through the PROCESSOR.

PROCESSOR Control Systems

Energizing the PROCESSOR

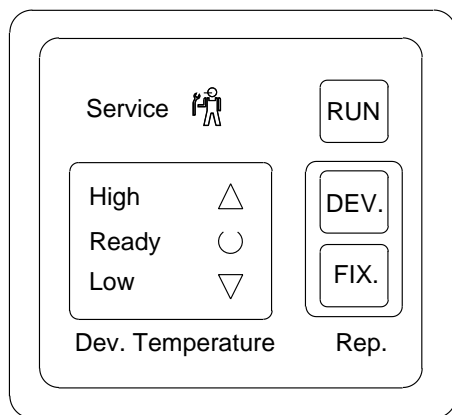
When the PROCESSOR is energized, the systems begin to operate to make the PROCESSOR ready to process film.

PROCESSOR Modes

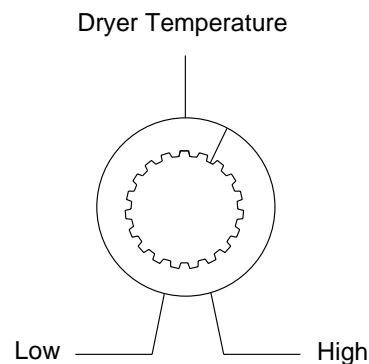
The PROCESSOR has 2 operating modes.

- In the Ready Mode, the PROCESSOR is energized and all systems are ready to process film.
- In the Standby Mode, the PROCESSOR is energized but the systems operate intermittently. The PROCESSOR automatically changes from the Ready Mode to the Standby Mode after 5 minutes. The PROCESSOR leaves the Standby Mode automatically when the operator inserts film, or manually when the "Run" BUTTON is pressed.

Operator Controls and STATUS INDICATORS



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Operator Controls

The following are operator controls and functions:

- ON/OFF POWER SWITCH - Energizes and de-energizes the PROCESSOR.
- DRYER TEMPERATURE CONTROL KNOB - Adjusts the DRYER air temperature.
- "Run" BUTTON - Manually starts 1 cycle of the film developing process and releases the PROCESSOR from the Standby mode.
- "Dev" BUTTON - Manually starts 1 cycle of the developer replenishment.
- "Fix" BUTTON - Manually starts 1 cycle of the fixer replenishment.

STATUS INDICATORS

There are 4 STATUS INDICATORS on the PROCESSOR:

- “Service” - Indicates a malfunction of the PROCESSOR.
- “High s” - Indicates the developer temperature is above the set•point. It is also used to indicate some temperature control malfunctions. See the **Indications and Error Functions** Table on Page [1–6](#).
- “Ready” - Illuminates when the PROCESSOR is ready to develop film and blinks when it is developing film.
- “Low t” - Indicates the developer temperature is below the set•point. It is also used to indicate some temperature control malfunctions. See the **Indications and Error Functions** Table on Page [1–6](#).

System Operations

Components of the PROCESSOR operate in different cycles as necessary.

Initializing Functions

When the PROCESSOR is energized:

- The DEVELOPER HEATER begins to operate, increasing the developer temperature to the set•point.
- The “Low t” INDICATOR illuminates when the developer solution is below the set•point temperature.
- DEVELOPER and Fixer Recirculation Pumps begin to operate. The PUMPS operate continuously for 5 minutes, until the PROCESSOR enters the Standby Mode.
- DEVELOPER and FIXER REPLENISHMENT PUMPS do not operate when the PROCESSOR is energized.
- The WATER SOLENOID operates for approximately 5 minutes, until the PROCESSOR enters the Standby Mode.
- The DRYER HEATER starts to operate, increasing the DRYER air temperature to the set•point.
- The DRYER BLOWER operates at maximum speed for 5 minutes, until the PROCESSOR enters the Standby Mode. The DRYER BLOWER then operates at a slow speed.
- The DRIVE MOTOR starts to operate. It operates continually for 5 minutes, until the PROCESSOR enters the Standby Mode.
- The “Ready” INDICATOR does not illuminate continuously until the PROCESSOR is ready to develop film.
- The STANDBY TIMER is reset.

Operation Functions when Processing Film

The PROCESSOR is ready to process film when the “Ready” INDICATOR is illuminated continuously. The operator inserts exposed film into the FEED TRAY.

When film is inserted into the FEED TRAY:

- The FILM SENSOR releases the PROCESSOR from Standby Mode, if necessary.
- The ALARM emits a beep. It will emit another beep when the PROCESSOR is ready for another film.
- The “Ready” INDICATOR blinks. The “Ready” INDICATOR illuminates continually when the PROCESSOR is ready to develop another film.
- The DRIVE MOTOR operates continually as film moves through the PROCESSOR.
- DEVELOPER and FIXER REPLENISHMENT PUMPS start and operate only as necessary to replenish the chemistry in the PROCESSOR.
- The WATER SOLENOID operates continuously until the PROCESSOR enters the Standby Mode.
- The DRYER BLOWER changes from slow speed to fast speed.
- The DRYER HEATER increases the temperature of the DRYER air to the DRYER set•point temperature.

Note

The sequence described above will also occur if the “Run” BUTTON on the PROCESSOR is pressed. The “Run” command starts the same sequence as the FILM SENSOR when it detects film.

Standby Mode Functions

The PROCESSOR enters the Standby Mode approximately 5 minutes after a film is processed and no more films are inserted.

When the PROCESSOR enters the Standby Mode:

- The DRIVE MOTOR operates intermittently for 25 seconds and stops for 5 seconds.
- The DEVELOPER and FIXER RECIRCULATION PUMPS operate intermittently for 5 seconds and stop for 5 seconds.
- If the PROCESSOR is set for replenishment in the Standby Mode, the DEVELOPER REPLENISHMENT PUMP operates for 1 replenishment cycle every 20 minutes.
- If the PROCESSOR is set for replenishment in the Standby Mode, the FIXER REPLENISHMENT PUMP operates for one replenishment cycle every 20 minutes.
- The WATER SOLENOID stops for 60 seconds, then operates intermittently for 10 seconds every 60 seconds.
- The DRYER BLOWER changes to slow speed.
- The DRYER HEATER decreases the DRYER air temperature to the low temperature setpoint.

Indications and Error Functions

The PROCESSOR uses the ALARM and INDICATORS to indicate system conditions and malfunctions.

Indication	Condition
<ul style="list-style-type: none"> • The "Low t" INDICATOR illuminates continually. • The "Ready" INDICATOR is not illuminated. 	The developer temperature is below the setpoint.
<ul style="list-style-type: none"> • The "High s" INDICATOR illuminates continually. • The "Ready" INDICATOR is not illuminated. 	The developer temperature is above the setpoint.
<ul style="list-style-type: none"> • The "Service" INDICATOR illuminates continually. • The "Low t" INDICATOR blinks. • The ALARM emits a beep. • The "Ready" INDICATOR is not illuminated. 	The developer temperature circuit is broken.
<ul style="list-style-type: none"> • The "Service" INDICATOR illuminates continually. • The "High s" INDICATOR blinks. • The ALARM emits a beep. • The "Ready" INDICATOR is not illuminated. 	The DRYER temperature circuit is broken.
<ul style="list-style-type: none"> • The "Ready" INDICATOR blinks when PROCESSOR is energized. 	The WASH TANK is filling
<ul style="list-style-type: none"> • Film will not enter the PROCESSOR (the DRIVE MOTOR does not operate). • The ALARM emits a beep if a film is inserted. 	The TOP COVER of the PROCESSOR is not seated correctly, or it has been removed from the PROCESSOR.