

SL SERIES

High-Resolution Recirculating-Printhead Inkjet System

CCS recirculating ink supply / High-opacity white ink / Continuous production lines

4

recirculating-printhead
configurations

108 mm

Maximum width per head

7 × 24

Designed for continuous
production lines



SL Series machine and dual-head modules shown.

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Recirculation inside the printhead supports production continuity

The SL Series combines recirculating heads with CCS ink supply to refresh ink near the nozzles and stabilize supply and return flow.

Continuous ink renewal

Supply → internal head circulation → return. CCS manages supply and return conditions and target pressure differential so pigment-heavy ink continues to move inside the head.

Four practical effects

01 / AIR

Air bubbles leave through recirculation

Reduce missing lines caused by trapped air. Bubble removal depends on the specific head flow path.

02 / PIGMENT

Lower white-ink settling risk

Faster ink renewal inside the head reduces settling of dense pigment in stagnant zones.

03 / RESTART

Faster restart after pauses

Keeping nozzles ready can shorten preparation at next-day startup, shift changes or intermittent operation.

04 / STABILITY

Better long-run stability

Continuous supply and bubble removal support print continuity and reduce line stoppages from missing lines.

Note: circulation paths and flows differ by printhead manufacturer. These mechanisms do not make every ink and operating condition maintenance-free.

Controlled circulation supports stable printing

CCS = Circle Control System. It integrates ink supply, circulation, pressure feedback and maintenance management.

CCS recirculating ink-supply system

Continuously renew ink inside the head and control supply and return conditions. The goal is less manual intervention and better restart and continuous printing with white ink, long jobs and intermittent operation.

Controlled loop from tank to head

01

Ink tank and agitation

02

Ink supply and
pressure

03

Circulation inside the
head

04

Ink return and
pressure differential

Four supporting capabilities

01 / PRESSURE

Pressure-differential management

Monitor supply and return pressures, coordinating the pumps to maintain the target differential and nozzle negative-pressure range.

02 / CONDITION

Liquid level and temperature

Refill according to liquid level and monitor temperature. Tank agitation helps reduce local white-ink settling.

03 / STATUS

Visible status

The control board saves and reports key settings. Alarms, reconnection and recovery can be traced.

04 / SERVICE

Documented maintenance

Depending on configuration, provide controls for ink filling, pressure testing, draining, overflow response and hardware tests.

Head circulation paths differ. Liquid-level, temperature, agitation, diagnostics and maintenance functions depend on the delivered SL configuration.

High-opacity white ink from next-day restart to continuous printing

For high-density white ink, reliable restart and stable color and lines over long runs matter as much as basic printability.

Observed on-site result

After shutdown the previous day, circulation was started the next day. Once the ink path stabilized, printing resumed without first purging ink or manually servicing the head.

Turn a smooth restart into a repeatable process

01**Before shutdown**

Follow shutdown and circulation or moisture-retention procedures

02**Next-day startup**

Confirm stable ink, temperature and pressure differential

03**Nozzle check**

Check first print and nozzle status

04**Start production**

Begin continuous operation after meeting quality criteria

Startup check: after circulation stabilizes, verify nozzle status and first-print quality before normal production.

Designed for 24/7 continuous lines

Continuous printing aims to reduce unplanned downtime and catch quality variation before it causes batch scrap.

<h2>Fewer line stops</h2> <p>More productive operating time</p>	<h2>Less ink purging</h2> <p>Less ink waste at startup</p>
<h2>Fewer missing lines</h2> <p>More stable long runs</p>	<h2>Easier changeovers</h2> <p>Recovery after shifts or brief stops</p>

Benefits of circulation

Ink renewal inside the head	Reduce local settling and trapped-air risks
Nozzle recovery	Reduce manual intervention during restart
Stable print output	Reduce rework from missing lines or color changes
Move from reactive to planned maintenance	Plan maintenance using nozzle checks, filtration and ink-path status

In a 24-hour on-site white-ink run, no intermediate ink purge was needed. Continue monitoring nozzle condition, ink path and first-print quality during production.

Four recirculating heads selected by job

Choose head modules by print width, resolution, speed and print distance.

Parameter	S1L	S2L	S3L	S4L
Printhead model	CF6R	RC1536	Xaar 2002	G5F
Print width / mm	54	108	70.5	54
Native resolution / npi	600	360	720	600
Print speed / m/min	30	157	75	76
Speed test conditions	600 × 600 dpi	360 × 360 dpi	720 × 720 dpi	600 × 600 dpi
Reference long-throw distance / mm	25	50	15	8

Speeds correspond to the listed resolution conditions. Actual results depend on ink, material and on-site conditions.

From white ink to functional printing

Recirculation does not make every ink compatible. It provides a wider tuning window for high-pigment inks, frequent starts and stops, and long print runs.

<p>01 / WHITE</p> <p>High-opacity white ink</p> <p>For dark materials, clear films, white underlayers and mark contrast. Verify opacity and adhesion with the actual ink.</p>	<p>02 / VARIABLE</p> <p>Variable-data traceability</p> <p>Print 1D barcodes, QR codes, UDI, batch numbers and database fields using shared templates and line timing.</p>
<p>03 / LAYDOWN</p> <p>Multiple ink volumes and overprinting</p> <p>Set target ink laydown by head, ink and waveform. Evaluate curing for high opacity or raised effects.</p>	<p>04 / GAP</p> <p>Parts with varying distance</p> <p>Long-throw capability differs by model. Test distance and drop placement on curved or stepped surfaces.</p>

Modular expansion and line integration

Printhead module	Up to 2 printheads per module; combine modules side by side to increase print width.
System scale	Supports up to 24 printhead modules and multiple cascaded control units.
Production-line interfaces	Supports TCP/IP, I/O, remote control, template switching and data exchange.

Machine capabilities and operating conditions

Review SL configuration across operation, printing, ink path and line interfaces.

Control platform	13.3-inch industrial capacitive touchscreen; Easyprint layout and control
Print content	Text, images, PDF, 1D barcodes, QR codes, database and variable data
Enclosure and direction	304 stainless-steel enclosure; downward printing
Modules and interfaces	Up to 2 printheads per module; Gigabit Ethernet, USB, RS232
Ink and colors	Oil-based and UV-curable inks; black, white, red, blue, etc.
Ink-path maintenance	CCS recirculating ink supply; one-touch automatic cleaning and secondary level detection
Power specifications	AC 220 V; machine power 500 W; rated current 5 A
Options and software	Multiple cascaded control units, remote status, scan-to-print and software customization

Validate benefits with production samples

Use the actual ink, head, workpiece and production pace for first-print, restart and continuous-run tests.

Typical configuration list

Control unit and heads	1 control unit and 1 printhead module; expand to the required print width.
Synchronization and mounting	Multi-axis bracket, encoder and mount, and fiber-optic sensor.
Ink and curing	Ink matched to the project; pair UV ink with an LED curing solution.
Software and maintenance	Printing software, license and dedicated printhead wipes.

Provide samples and test conditions

Print content / Material samples / Ink and color / Target line speed / Print distance / Shutdown duration / First-print acceptance criteria / Continuous-run and maintenance window



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