

ORIENT

OPERATION & MAINTENANCE MANUAL

Web Offset Printing Machines

For Book, Newspaper, Security & Commercial Printing



Covering Orient Standard, Super, X-Cel, X-Press & XLC Series
Printing Units, Folders & Ancillary Equipment

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Chapter 1: Introduction

This Operation and Maintenance Manual provides comprehensive guidance for the safe and efficient operation, adjustment, and maintenance of Orient web offset printing machines. It is intended for use by trained operators, maintenance technicians, and supervisory personnel who are responsible for the day-to-day running of Orient printing equipment.

Orient is an industry leader in the manufacture of web offset printing machines, with a heritage dating back to 1946. With over eight decades of experience in precision engineering, design, and manufacturing, Orient has exported products to more than 40 countries with over 20,000 printing units installed worldwide. The equipment is manufactured in state-of-the-art facilities and is renowned for its robust, proven design, ease of operation, and compact footprint.

This manual covers the complete Orient range of single-width, single-circumference web offset presses, including the Orient Standard, Orient Super, Orient X-Cel, Orient X-Press, and Orient XLC series. It also covers all associated folders, reel stands, and ancillary equipment.

1.1 Purpose and Scope

The purpose of this manual is to:

- Provide detailed operating procedures for all Orient web offset printing machines and folders.
- Outline preventive and corrective maintenance schedules and procedures.
- Describe safety precautions and protocols to protect personnel and equipment.
- Serve as a reference for troubleshooting common operational issues.
- Provide technical specifications for each machine model and module.

1.2 How to Use This Manual

This manual is organised into clearly defined chapters. Operators should familiarise themselves with the entire manual before operating the equipment. The Safety chapter must be read and understood before any work is carried out on or near the press. Specific sections may be referenced as needed during daily operations and maintenance activities.

1.3 Terminology

Throughout this manual, the following terms are used consistently:

- **Operating Side:** The side of the press unit on which most of the operating controls are located.
- **Drive Side:** The side of the press or unit on which gears and horizontal shafts are located.
- **SAFE:** The condition in which the press is stopped and all moving parts are stationary, with safety interlocks engaged.

- Inching: Running the press at very slow speed for setup and adjustment purposes.
- Web: The continuous roll of paper that passes through the press.
- Cut-off: The length of paper cut by the folder, determined by the circumference of the cutting cylinder.

1.4 Machine Range Overview

The Orient range of web offset printing machines covers a wide spectrum of applications from newspaper and book printing to commercial and security printing. The key models are summarised below:

Model	Max Speed (CPH)	Type	Modules Available	Applications
Orient Standard	16,000	Single Width, Single Circ.	Mono Unit, 3-Colour Satellite	Newspaper, Book, Commercial
Orient Super	30,000	Single Width, Single Circ.	Mono Unit, 3-Colour Satellite, 4-High Tower	Newspaper, Book, Tabloid, Commercial
Orient X-Cel	36,000	Single Width, Single Circ.	Mono Unit, 3-Colour Satellite, 4-High Tower	Newspaper, Book, Tabloid, Semi-Commercial
Orient X-Press	50,000	Single Width, Single Circ.	Mono Unit with Auto Reel Changers, 4-High Tower	High-Speed Newspaper, Tabloid, Semi-Commercial
Orient XLC	30,000	Single Width, Single Circ.	Compact 4-High Tower	Newspaper, Book, Tabloid, Commercial



Chapter 2: Safety Precautions

Safety is a state of mind. It means looking ahead, planning ahead, and assuming that any hazard can materialise if proper precautions are not taken. Every person involved in the operation, maintenance, or supervision of Orient printing equipment must read and understand this chapter before carrying out any work.

2.1 General Safety

The operation of printing equipment of any type may present hazards to the operator. Improper practices or lack of attention and care may increase such hazards. The safety reminders in this chapter supplement any other oral or written instructions which the equipment operator may have received prior to operating the equipment. These reminders should be considered in light of existing standard operating procedures for equipment in every plant.

Each plant should maintain a regular programme of safety checks and instructions. The programme should be especially concerned with operating practices designed to minimise hazards of injury to personnel and of damage to the equipment.

2.2 Safety Devices

1. Always put the press on SAFE when making adjustments or performing maintenance work.
2. Use the push button at the station closest to the area where the work is being done.
3. After pressing a button, always be certain that the SAFE signal lights are glowing.
4. Do not bypass built-in devices and interlocks. All safety devices, whether mechanical or electrical, should be functional at all times.
5. Do not operate machinery when guards or covers are removed or open.
6. Conversely, do not open guards when machinery is running.

2.3 Press Safety

- Do not touch any moving part of the press.
- Be sure the press is stopped and in SAFE condition before touching any operating part.
- Do not oil or grease machinery while it is in operation.
- Stand clear of the press when signal lights and bell sound to indicate the press will start running.
- Clean up paper, dust, spilled ink or oil, and other waste which may accumulate on or around the press.
- Do not leave tools, clothes, oil cans, or other materials on press frame, housings, platforms, or in aisles.
- Always replace floor plates immediately after completing work below the floor.

2.4 Printing Unit Safety

- Do not attempt to clean blankets or cylinders while the press is running.
- Do not attempt to wipe inking rollers or drums while the press is running.
- Remove levers or wrenches from sockets immediately after they have been used and before starting the press.
- Avoid standing in the aisles between units while the press is running.

2.5 Folder Safety

- Do not reach into the folder while the press is running.
- Keep hands clear of the cutting cylinder, jaw cylinder, and nipping rollers at all times during operation.
- Ensure the folder jam switch is functional and tested before every production run.
- Do not attempt to clear a paper jam while the machine is in motion.

2.6 Electrical Safety

- Only qualified electricians should work on electrical systems.
- Ensure all electrical panels are closed and locked during operation.
- Report any frayed wires, damaged cables, or electrical faults immediately.
- Ensure proper earthing of all electrical equipment at all times.

2.7 Personal Protective Equipment (PPE)

All personnel working on or near Orient printing equipment should wear appropriate personal protective equipment, including:

- Safety shoes with non-slip soles.
- Close-fitting clothing (no loose sleeves, ties, or jewellery near moving parts).
- Safety glasses when working with solvents or cleaning agents.
- Hearing protection in high-noise areas.
- Chemical-resistant gloves when handling inks, solvents, and cleaning agents.

Chapter 3: Machine Description and Specifications

Orient web offset printing machines are built around a modular architecture that enables a wide range of press configurations. The basic unit body consists of a high-grade, stress-relieved cast iron frame that is machined on sophisticated computer numerical control (CNC) machines to ensure interchangeability and precision.



3.1 Printing Modules

The Orient range of printing modules includes:

3.1.1 Mono Unit with Integral Reel Stand

The mono unit is the fundamental building block of Orient web offset press configurations. It is capable of printing one colour on either side of the web (1+1). Alternatively, a 2+0 colour combination can be achieved by direct litho printing. Key features include:

- Lever-type swing-down ink fountain with overrides for the ink fountain roller.
- Dynamically-balanced hard chromium plated plate and blanket cylinders.
- On-the-nose, slit, or spring-type plate lock-up system.
- Motorised side register system for both plate cylinders, on the run.
- Infrared web-break detector.
- Pneumatic on/off for main impression, ink feed, ink form, and damper form.
- Safety guards and centralised oil pressure lubrication for drive gears.
- Provision for printing two colours on the same side of the web (direct litho).
- Variable-speed motorised dampening with brushmist dampening system.
- Centralised water circulation system.
- PU-covered ink vibrator rollers.
- T-bar blanket lock-up system and cable management system.

3.1.2 Three-Colour Satellite Unit

The three-colour satellite unit is capable of printing 3+0, 2+1, or 1+2 colour combinations on one web. Additional features include:

- Stainless steel, balanced main impression cylinder.
- Motorised running circumferential register on two plate cylinders.
- Heavy-duty compensator.
- All standard mono unit features.

3.1.3 Four-High Tower

The stack unit is identical to the mono unit but without the reel stand. It can be mounted on a three-colour satellite to print 4+1, or on a mono unit to print 2+2. When configured as a four-high tower, it can print 4+4, 4+2, or 4+1 with one web. With two webs, a four-high tower can print 1+1 and 4+2, or 2+2 and 2+2 combinations. With three webs, 1+1, 1+1, and 2+2, or 1+1, 1+1, and 1+1 combinations can be printed.

3.2 Reel Feeding Modules

3.2.1 Reel Stand with Pneumatic Disc Brake

The reel stand is provided with pneumatically operated disc brakes in lieu of spring-controlled shoe brakes. The position of the dancing arm is controlled by a special valve operated by a cam. The dancing arm, through the disc brake, controls the web tension. Due to the inherent design of the disc brake system and pneumatic control, this system controls the tension better than shoe-type brakes with spring control.

3.2.2 Auto Reel Changer (ARC)

The auto reel changer provides automatic reel splicing for continuous, uninterrupted production. Key specifications:

Parameter	Specification
Side Lay	+/- 10 mm
Max. Roll Capacity	42 inches / 1070 mm
Brake	Fully automatic pneumatically operated disc brakes with four calipers
Expiry Roll Diameter	120 mm after pasting
Infeed System	Built-in, close loop, through independent DC drive
Reel Loading	Through trolley suitable for 965 to 1070 mm diameter rolls
Controls	Built-in auto/manual controls, PLC operated, digital drives
Dancing Arm	To control web tension before infeed roller, close loop system
Acceleration	Through belt driven by AC motor synchronisation

Roll Width	35 inches / 889 mm maximum
Diameter Sensing	Continuous diameter sensing and display on HMI to control brake pressure

3.3 Folder Options

Orient offers a comprehensive range of jaw-type and tucker-type folders to meet diverse production requirements.

3.3.1 Jaw Type 1:2 Folder (Standard)

An economical, rugged 1:2 folder capable of folding four webs in broadsheet or tabloid format at speeds up to 16,000 copies per hour. Features include mechanical copy counter, kicker for 25 copies, oil bath lubrication for drive side gears, main drive shaft coupled with splined hub at cylinder height for minimum backlash, slitter or perforator on roller as standard accessories, and forward or reverse lap capability.

3.3.2 Jaw Type 1:2 Folder (Super)

A 1:2 folder capable of folding eight webs (with double RTF roller) in broadsheet or tabloid format at speeds up to 30,000 copies per hour. Features include RTF roller, cutting cylinder, and jaw cylinder with dynamic balance air former, double nipping roller, folder jam switch, electronic copy and good copy counters, kicker for 0 to 99 copies adjustable, centralised oil pressure lubrication for drive gears, hardened and ground gears for folder drive and cylinder, and lap adjustment in the range of +/- mm.

3.3.3 Jaw Type 2:2 Folder (X-Cel)

Designed for higher speed operations up to 36,000 copies per hour, with all Super folder features plus enhanced precision and durability for sustained high-speed production.

3.3.4 Tucker Folder (X-Press)

A high-speed tucker folder designed for operations up to 50,000 copies per hour, optimised for newspaper production with rapid make-ready and high reliability.

3.3.5 Signature Size Reference

Cut-off	Broadsheet	Tabloid	Quarterfold	Double Parallel
630 mm	330-444 x 630 mm	315 x 330-444 mm	165-222 x 315 mm	157.5 x 330-444 mm
578 mm	330-444 x 578 mm	289 x 330-444 mm	165-222 x 289 mm	144.5 x 330-444 mm
560 mm	330-444 x 560 mm	280 x 330-444 mm	165-222 x 280 mm	140 x 330-444 mm
546 mm	330-444 x 546 mm	273 x 330-444 mm	165-222 x 273 mm	136.5 x 330-444 mm

533 mm	330-444 x 533 mm	266.5 x 330-444 mm	165-222 x 266.5 mm	133 x 330-444 mm
508 mm	330-444 x 508 mm	254 x 330-444 mm	165-222 x 254 mm	127 x 330-444 mm

NOTE: Sizes shown are untrimmed and depend on web width used. Available cut-off options are 508, 533, 546, 560, and 578 mm.

3.3.6 Folder Options

- Double RTF rollers for running eight webs.
- Quarter-page folder.
- Double parallel folder.
- Cross perforator.
- Web under lead system.
- Clutch on operation side of folder.
- Cut-off control of folder of maximum four webs on both sides.
- Single shot grease lubrication for operating side bearings and cams.
- Slitter or perforator on nipping rollers.
- Upper former.
- Fly wheel delivery for folded edge leading.
- Motorised cut-off controls.

Chapter 4: Operating Controls

This chapter describes all major operating controls found on Orient web offset printing machines. The layout and positioning of controls may vary depending on the specific configuration ordered.



4.1 Press Drive Controls

Main press drive controls are located either in the pendant control mounted on the folder or on a free-standing console, depending upon the configuration of the machine ordered. Auxiliary controls are located on each unit station on the operating side of the frame unit.

4.2 Inking System Controls

4.2.1 Ink Feed Roller Throw-Off Levers

These levers engage or disengage the ink feed rollers with the ink fountain roller.

4.2.2 Ink Form Roller Throw-Off Levers

These levers engage or disengage the ink form rollers (i.e., bring them in or out of contact with the plate cylinders). These functions can be manually or pneumatically controlled depending upon the features ordered in the machine.

4.2.3 Ink Fountain Levers

Ink fountain levers move the ink fountain blade to control ink flow. Moving the lever downwards increases the ink flow, whereas moving the levers upwards reduces the ink flow. At the topmost position of the lever, the ink flow is minimum; at the bottom-most position, the ink flow is maximum. For machines provided with screw-type control, turning the screws clockwise increases the ink flow and anticlockwise decreases the flow.

4.3 Dampener Controls

4.3.1 Dampener Form Throw-Off Levers

These levers engage or disengage dampener form rollers (in or out of contact with the plate cylinder).

4.3.2 Master Dampener Control Switch

Located on the console as per the configuration of the ordered machine, this controls the supply for all dampener motors. When the selector switch is in the Auto position, the unit dampener motors will stop or start as the press is started or stopped, except when inching.

4.3.3 Master Dampener Speed Control

The speed of all dampener motors is set according to the settings made on the unit dampener motor speed controls. The speed is set by potentiometers provided for the same. Increasing the setting on the dial will increase the amount of solution delivered by increasing the speed of the motor. The dampener motors can be switched ON/OFF on unit as per position of the selector switch.

4.4 Register Controls

4.4.1 Cut-Off Compensators

The compensators are provided either with manual control or motorised control as per order. They are provided on the folder and/or the units as per layout decided at the time of ordering of the machine. They are used to register the cut-off at the folder. Clockwise movement increases the margin at the pin-side edge of the page.

4.4.2 Lateral (Side) Register

Side register controls adjust the lateral position of the printed image on the web. These are motorised and can be adjusted on the run from the operating side of the press.

4.4.3 Circumferential Register

Circumferential register controls adjust the position of the image around the cylinder. On three-colour satellite units, motorised running circumferential register is provided on two plate cylinders.

Chapter 5: Preparing to Run

This chapter describes the procedures for preparing the Orient web offset press for a production run. All preparation should be carried out with the press in SAFE condition.

5.1 Loading the Reel

1. Position the reel on the loading shaft using the reel chucks.
2. Tighten the reel chucks to ensure the reel is firmly secured and centred.
3. Tighten the locking screw to secure the chuck in position.
4. Ensure the brake drum and tightening disc are properly engaged.
5. Thread the web through the press following the web path diagram specific to your machine configuration.

CAUTION: Ensure the reel is centred on the shaft before tightening. An off-centre reel will cause web tracking issues and may damage the press.

5.2 Web Threading

Thread the web through the press following the designated web path for your specific configuration. The web must pass correctly through all guide rollers, compensators, and printing units before entering the folder. Ensure the web is not twisted and that proper tension is maintained throughout.

5.3 Mounting Plates

1. Clean the plate cylinder surface thoroughly.
2. Position the plate on the cylinder, engaging the leading edge in the plate clamp.
3. Rotate the cylinder slowly to wrap the plate around it.
4. Engage the trailing edge in the tail clamp and tighten.
5. Ensure the plate is seated evenly with no wrinkles or buckles.
6. Set the side register to align the plate correctly.

CAUTION: Put the press on SAFE before mounting or removing plates. Never attempt plate changes while the press is running or in motion.

5.4 Mounting Blankets

Blankets are secured to the blanket cylinders using the T-bar blanket lock-up system. Ensure blankets are of the correct size and type for your press model. The blanket should be uniformly tensioned across the full width of the cylinder. Replace blankets that show signs of glazing, smashing, or uneven wear.

5.5 Ink System Preparation

1. Fill the ink fountain with the appropriate ink for the job.
2. Set the ink fountain levers to provide the approximate ink film thickness required.
3. Engage the ink feed rollers and ink form rollers.
4. Run the press at slow speed to distribute ink evenly across the roller train.

5.6 Dampening System Preparation

1. Fill the dampening water reservoir with fountain solution mixed to the correct concentration.
2. Set the dampener speed control to the appropriate level.
3. Engage the dampener form rollers.
4. Allow the dampening system to circulate for several minutes before starting the print run.

NOTE: The dampening solution concentration and temperature should be monitored regularly during the production run. Use the centralised water circulation system to maintain consistent solution quality.

Chapter 6: Running Procedures

6.1 Starting the Press

7. Ensure all personnel are clear of the press and all guards are in place.
8. Sound the warning bell and wait for the designated time before starting.
9. Start the press at low speed (inching) and check for proper web tracking.
10. Gradually increase press speed to the desired operating speed.
11. Monitor ink density and dampening levels, making adjustments as needed.
12. Check register on printed copies and adjust as necessary.
13. Engage the copy counter once acceptable print quality is achieved.

6.2 During the Run

During the production run, the operator should continuously monitor:

- Print quality including colour density, registration, and image sharpness.
- Web tension and tracking.
- Ink and dampening levels.
- Folder operation and copy delivery.
- Any unusual sounds, vibrations, or odours.

6.3 Stopping the Press

14. Disengage the dampener form rollers.
15. Disengage the ink form rollers.
16. Reduce press speed gradually.
17. Press the STOP button.
18. Once the press has come to a complete stop, engage the SAFE mode.

6.4 Direct Printing (Litho)

Orient presses can be configured for direct printing (direct litho), which allows printing two colours on the same side of the web using a single mono unit. In this mode, the blanket cylinder of one unit prints directly onto the paper web as it passes through. This technique is particularly useful for two-colour work where both colours need to appear on the same side of the sheet.

Chapter 7: Plate Positioning and Registration

Accurate plate positioning is critical for achieving correct registration and print quality. Orient presses provide both manual and motorised register adjustment systems.

7.1 Lateral (Side) Register Adjustment

Side register is adjusted by moving the plate cylinder laterally. The motorised side register system allows adjustments to be made on the run from the operating side of the press, minimising waste and downtime.

7.2 Circumferential Register Adjustment

Circumferential register adjustment alters the timing of the printed image around the cylinder. On satellite units, motorised running circumferential register is available on two plate cylinders.

7.3 Cut-Off Register

Cut-off register is controlled by compensator rollers, which adjust the web path length to ensure the printed image aligns correctly with the fold and cut position in the folder. Fine adjustments can be made using motorised cut-off controls where fitted.

Chapter 8: Maintenance

A regular and thorough maintenance programme is essential for the reliable, long-term operation of Orient web offset printing machines. This chapter provides preventive maintenance schedules and procedures for all major subsystems.

8.1 Daily Maintenance

- Clean all ink and dampening rollers at the end of each production run.
- Wipe down plate and blanket cylinders.
- Clean ink fountains and dampening trays.
- Inspect web path for paper debris and clean as necessary.
- Check ink and dampening solution levels.
- Inspect blankets for damage, glazing, or smashing.
- Visually inspect all safety guards and interlocks.

8.2 Weekly Maintenance

- Clean and inspect all roller bearings.
- Check and top up lubrication points as per the lubrication chart.
- Inspect drive belts and chains for wear and correct tension.
- Clean air filters on pneumatic systems.
- Check water circulation system filters and clean or replace as needed.
- Inspect electrical connections for signs of overheating or corrosion.
- Test all emergency stop buttons and safety interlocks.

8.3 Monthly Maintenance

- Inspect and adjust roller pressures as per specifications.
- Check cylinder bearer pressures and adjust if necessary.
- Inspect and clean the dampening system thoroughly.
- Check all pneumatic cylinders and valves for proper operation.
- Inspect the folder cutting blade and replace if dull or damaged.
- Grease all specified grease points as per the lubrication chart.
- Check gear oil levels in the drive side gear boxes.

8.4 Quarterly Maintenance

- Full inspection of all roller surfaces for wear, glazing, or damage.
- Comprehensive check of all drive gears for wear and backlash.
- Inspection and calibration of all register systems.

- Check alignment of all cylinders.
- Full electrical system inspection by a qualified electrician.
- Inspect and service the centralised lubrication system.

8.5 Annual Maintenance

- Complete overhaul of the dampening system.
- Replacement of all wear items including seals, gaskets, and filters.
- Full calibration of all measuring and control instruments.
- Comprehensive gear and bearing inspection with replacement as needed.
- Full electrical panel inspection and thermal imaging survey.
- Coolant system flush and refill.

Chapter 9: Ink and Dampener Roller Setting

Correct roller setting is critical for consistent print quality and even ink and dampening distribution. Contact pressure between rollers must be set as lightly as possible without affecting printing quality, and should be uniform along the entire length of the roller.

9.1 Checking Roller Pressure

Pressure of the inking rollers should be checked by measuring the width of the ink strips across the length of the roller. The strips should be 3 mm to a maximum of 5 mm wide across the length of the roller. To check strip width, the roller must be evenly inked. Stop the press for a few seconds, then inch the press until the strip is visible.

NOTE: Be sure to observe the ink strip for only the roller being set. Refer to the roller diagram in your machine-specific documentation to locate the roller to be adjusted. Note that each roller or drum has been identified by a letter (A, B, etc.), which corresponds to the information listed in the roller specification chart and the adjustment procedures.

9.2 Dampener Roller Setting

The pressure between the dampener rollers is checked by the use of slip-sheets. Refer to the roller setting diagram for the correct dampener settings. If even ink and dampener distribution cannot be maintained, do not run the press with heavy roller pressure. Check the rollers for uneven wear and replace them if necessary.

9.3 Ink Feed Roller Gap Setting

Check the gap between the ink feed roller and the ink fountain roller with a feeler gauge. A gauge of 0.08 mm (0.003 inches) should fit between the rollers along their entire length. A gauge of 0.10 mm (0.004 inches) should not fit at any point.

Procedure:

19. Put the press on SAFE and wash the ink feed and ink fountain rollers.
20. Move the ink feed lever to the ON position. Check the gap with the 0.08 mm feeler gauge. Make the check at both ends of the rollers.
21. If adjustment is necessary: Move the ink feed lever to the OFF position, open the handwheels and operating side cover. Put the ink feed lever back to the engage position.

To decrease the gap: Loosen lock nut C about two turns, then insert the feeler gauge between the rollers. Turn stopscrew D clockwise until the gap is correct. Then tighten locknut C.

CAUTION: The ink feed roller must not contact the ink fountain roller. Always verify the gap at both ends after adjustment.

Chapter 10: Reel Stand and Disc Brake Operation

10.1 Pneumatic Disc Brake Setup

22. Use clean and dry air to the filter regulator unit/dummy unit.
23. Connect the airline from the compressor to the main FRC unit fitted on the drive side frame of the mono unit/reel stand/dummy unit. Set pressure from the FRC knob to show a reading of 6 to 7 bar on the dial gauge.
24. Put the ON/OFF switch of the brake in the ON position.
25. Set pressure from the regulator for the dancing arm cylinder between 3 and 5 bar. The dancing arm will go to the extreme outer position.
26. Set the pressure from the pressure regulator for the brake input. The dial gauge of the regulator should show pressure between 3 and 6 bar, depending upon the configuration of the machine and the position of the brake unit.
27. If the pressure in step 5 is set at 6 bar, the dial of the plunger-type regulator for brake pressure will show 6 bar at the extreme outer position of the dancer arm.
28. Now move the dancing arm to its innermost position. The dial of the plunger-type pressure regulator should show 0 to 0.5 bar reading on the dial. If not, adjust the cam to get the desired reading.
29. Check again the pressure reading on the plunger-type regulator dial: at the extreme outer position it should be 6 bar.
30. Check pressure readings at the extreme outer and extreme inner positions of the dancing arm 2 to 3 times to be sure that the desired pressures are set.
31. The pressure setting for each reel stand will be different, depending upon the position of the particular reel stand in the machine configuration and the web tension requirement of different printing modules.

10.2 Reference Pressure Settings

For initial setting of brake pressures, the following reference pressure setting chart is provided. Actual readings of pressure are to be adjusted during actual running of paper during printing trial, depending upon the tension required in each web for good printing. The chart below is for a typical configuration (RS1+4Hi+RS2+4Hi+RS3+4Hi+Folder+RS4):

Parameter	R.S-1	R.S-2	R.S-3	R.S-4
Dancing Arm Pressure	4.0 Bar	3.8 Bar	2.0 Bar	3.2 Bar
Input Pressure for Brake Regulator	4.0 Bar	3.4 Bar	2.8 Bar	3.4 Bar
Output Pressure for Brake Regulator	3.8 Bar	3.2 Bar	2.4 Bar	3.4 Bar

NOTE: Above values are for reference only. Actual values must be fine-tuned during production trials.

Chapter 11: Folder Operation

The folder is one of the most critical components of the web offset press. It receives the printed webs from the printing units, slits, folds, cuts, and delivers the finished product. Proper operation and maintenance of the folder is essential for consistent product quality.

11.1 Folder Operating Controls

- RTF (ribbon turning former) trolley throw-off handle with lock dog pin.
- RTF adjusting hand wheel.
- Nipping roller hand wheel.
- Speed indicator.
- Delivery hand wheel.
- Delivery lever with lock lever.
- Mechanical and electrical counters.

11.2 Quarter Folder Controls

Where a quarter folder is fitted, additional controls include:

- Quarter fold brush handwheels.
- Quarter fold stripper shoe lever with lock screw.
- Quarter fold nipping pulley handwheels.
- Quarter fold adjustment handwheels.
- Quarter fold roller handwheels.
- Quarter fold centering screw.
- Quarter fold jam switch.

11.3 Preparing the Folder

Before starting a production run:

32. Disengage and then re-engage the folder following the specified sequence.
33. Position the RTF trolleys correctly for the web configuration.
34. Position the slit trolley for the required slit position.
35. Adjust nipping rollers for the correct number of webs.
36. Set nipping rollers when changing web width.
37. Configure the nipping roller perforator arrangement as required.
38. Set the cross perforator arrangement if needed.
39. Configure the fold type (even fold or 7 mm lap fold) as required.

Chapter 12: Lubrication

Proper lubrication is essential for the longevity and reliable operation of all Orient web offset printing machines. The centralised oil pressure lubrication system serves the drive side gears, while individual lubrication points require manual attention as per the schedules below.

12.1 Lubrication Types

Lubrication Type	Application	Frequency	Grade
Gear Oil (EP)	Drive side gear boxes	Check monthly, change annually	EP 90 or equivalent
Hydraulic Oil	Centralised lubrication system	Check weekly, top up as needed	ISO VG 68 or equivalent
Grease (EP)	Bearings, cams, bushings	As per lubrication chart	EP2 lithium grease
Light Machine Oil	Sliding surfaces, linkages	Daily or as needed	ISO VG 32 or equivalent

12.2 Lubrication Schedule

Daily:

- Oil all sliding surfaces and linkage points on the operating side.
- Check centralised lubrication system reservoir level.

Weekly:

- Grease all specified grease nipples on operating side bearings and cams.
- Check oil bath levels in folder drive gears.

Monthly:

- Check gear oil levels in all drive side gear boxes.
- Inspect centralised lubrication system filters and pumps.
- Grease all specified monthly grease points.

Annually:

- Drain and replace gear oil in all gear boxes.
- Flush and refill the centralised lubrication system.
- Replace all lubrication system filters.

WARNING: Never oil or grease the machine while it is in operation. Always put the press on SAFE before carrying out any lubrication tasks.

Chapter 13: Troubleshooting

This chapter provides guidance for diagnosing and resolving common operational issues encountered during production.

13.1 Print Quality Issues

Problem	Possible Cause	Corrective Action
Uneven ink distribution	Incorrect roller pressure settings; worn or glazed rollers	Adjust roller pressures as per Chapter 9; replace worn rollers
Poor registration	Incorrect compensator settings; web tension variations	Adjust compensators; check reel stand brake pressures
Ink scumming	Insufficient dampening; contaminated fountain solution	Increase dampener speed; replace fountain solution
Ghosting	Insufficient ink supply; incorrect roller settings	Increase ink flow; check roller train settings
Blanket smashing	Paper wrapping around cylinder; excessive pressure	Replace blanket; check impression pressure
Web breaks	Excessive tension; paper defects; misalignment	Adjust tension; inspect paper; check web path alignment

13.2 Mechanical Issues

Problem	Possible Cause	Corrective Action
Unusual vibration	Worn bearings; unbalanced cylinders; loose components	Inspect and replace bearings; check cylinder balance
Excessive noise from gears	Insufficient lubrication; worn gears; incorrect backlash	Check and top up lubricant; inspect gears; adjust backlash
Folder jams	Incorrect nipping roller settings; worn cutting blade; debris	Adjust nipping rollers; replace blade; clean folder
Dampener motor failure	Electrical fault; worn motor; overload	Check electrical connections; inspect motor; check load

Chapter 14: Optional and Ancillary Equipment

Orient offers a wide range of optional and ancillary equipment to enhance the capability and productivity of its web offset printing machines.

15.1 Printing Unit Options

- Motorised RCR (Running Circumferential Register) for loading side plate register.
- Heavy-duty compensator.
- Reel lifters (pneumatic control).
- Clutch on either side of unit.
- Automatic grease lubrication for operating side bearings and bushes.
- Auto reel changers.
- Narrow gap blanket cylinder.
- Centralised water circulation system with chiller.
- Solid stainless-steel plate and blanket cylinders.
- Hardened and ground bushes in frame for plate and blanket cylinder sleeves.
- AC drive.

15.2 Reel Stand Options

- Zero-speed splicer for continuous reel splicing.
- Pneumatic disc brake system.
- Automatic tension control with dancing arm.
- Pneumatic shafts.
- Independent brake for each reel shaft.
- Loading trolley for easy reel loading.

15.3 Auxiliary Equipment

- Ink pumping systems.
- Centralised dampening solution mixing and circulation systems.
- Web inspection systems.
- Colour management and density control systems.
- Conveyor and stacking systems.
- Waste paper extraction and baling systems.

Chapter 15: Technical Specifications

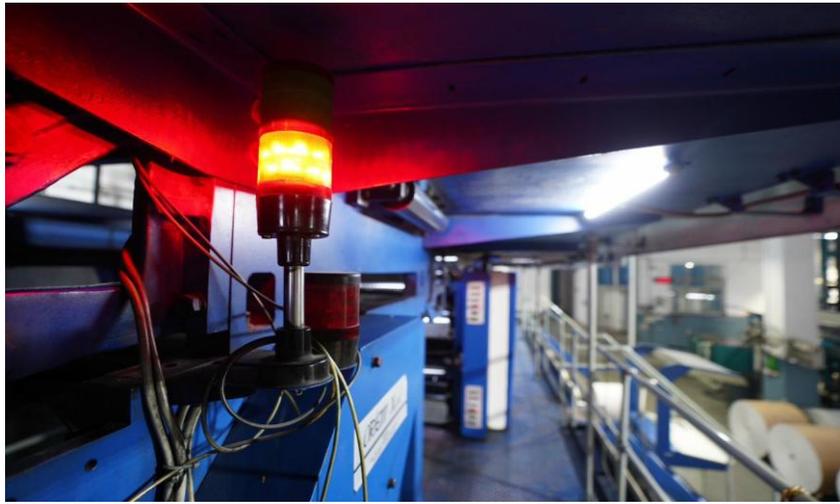
16.1 Auto Reel Changer Specifications

Parameter	Value
Maximum Reel Width	1020 mm
Maximum Reel Diameter	1270 mm
Maximum Reel Weight	700 kg
Maximum Web Speed	420 m/min
Pneumatic Pressure	7 kg/sq.cm
Machine Weight	3000 kg
Hoist Weight	600 kg

16.2 General Press Configuration Data

The following general data applies across the Orient range. Specific configurations may vary depending on the model and options selected. Consult the machine-specific data sheet provided with your press for exact specifications.

Feature	Standard / Super / XLC	X-Cel / X-Press
Press Type	Single Width, Single Circ.	Single Width, Single Circ.
Available Cut-offs	508, 533, 546, 560, 578 mm	508, 533, 546, 560, 578 mm
Speed Range	16,000 to 30,000 CPH	36,000 to 50,000 CPH
Plate Cylinder	Hard Chromium Plated	Hard Chromium Plated
Blanket Cylinder	Hard Chromium Plated	Hard Chromium Plated
Dampening System	Brushmist	Brushmist
Web Break Detection	Infrared	Infrared



Appendix A: Glossary of Terms

Term	Definition
Blanket	Rubber-coated sheet mounted on the blanket cylinder that transfers ink from the plate to the paper.
Circumferential Register	Adjustment of image position around the plate cylinder.
Compensator	Roller that adjusts web path length to control cut-off register.
Cut-off	Length of paper cut by the folder in one revolution of the cutting cylinder.
Dancing Arm	Pivoting arm with a roller that maintains web tension between the reel stand and printing units.
Dampener	System that applies a thin film of water to the plate to prevent ink from adhering to non-image areas.
Direct Litho	Printing method where the blanket prints directly onto the paper to achieve 2+0 colour on a mono unit.
Former Board	Triangular board in the folder that creates the first longitudinal fold in the web.
Impression	The transfer of the inked image from blanket to paper.
RTF	Ribbon Turning Former; a device that turns and redirects web ribbons in the folder superstructure.
Satellite	A multi-colour printing unit with a common impression cylinder shared by multiple plate/blanket sets.
Side Register	Lateral adjustment of the plate cylinder position relative to the web.
Web	Continuous roll of paper that feeds through the press.

Appendix B: Recommended Consumables

Item	Specification	Notes
Printing Ink	Web offset news ink or commercial grade as required	Use inks recommended by Orient or approved equivalents
Fountain Solution	Alcohol-based or alcohol-substitute type	Maintain correct pH and conductivity
Blankets	Compressible type, sized to specification	Replace at first signs of glazing or damage
Printing Plates	Pre-sensitised aluminium offset plates	Store in cool, dry conditions away from light
Wash-up Solution	Low-VOC roller wash	Use in well-ventilated areas with appropriate PPE
Lubricants	As per lubrication chart (Chapter 12)	Use only recommended grades

For all spare parts, consumables, and technical support, please contact your nearest Orient service centre or the manufacturer directly.

End of Orient Operation & Maintenance Manual