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Product Guide

VS-640i / 540i / 300i

Version 1.3 June 16, 2021

Roland DG Corporation

Version	Date	Description of Changes
1.0	Sep. 2, 2013	First Edition
1.1	Dec. 27, 2013	p.23, 24, 25: Added ink consumption comparison p.26: Added comparison of white concentration
1.2	Jun. 30, 2015	p.40: Ink consumption and time of cleaning functions have been changed.
1.3	Jun. 16, 2021	P.49: Added VersaWorks

Contents

1. Product Information
2. Printing Theory
3. Ink
4. Ink Line
5. Take-up Unit
6. Media Heating System
7. Cutting Function
8. Cleaning Function
9. Interface
10. Other Features
11. Special Pump Operations
12. Roland VersaWorks
13. Transport
14. Maintenance
15. Consumables

1. Product Information

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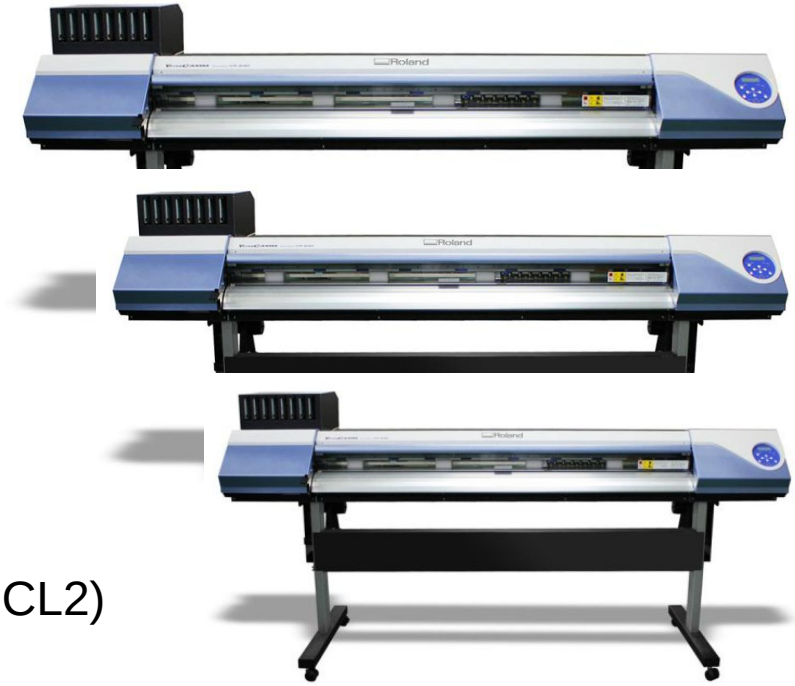
- VS-640i/540i/300i
  - VersaCAMM series, Printer/Cutter
    - 64 inch , 54 inch , 30 inch
  - Roland Gold Print Head
  - ECO-SOL MAX2 ink, MAX3 ink
  - Ink types
    - CMYK CMYK
    - CMYK,Lc,Lm + WH + Mt
    - CMYK,Lc,Lm,Lk + (ESL4-CL, ESL4-CL2)
    - CMYK,Lc,Lm,Lk + WH or Mt
  - Electrical-driven auto-choke system
  - Ink Circulation System
  - Optional Take-up Unit TU2
  - Print Quality: to meet the quality standard of XR-640
  - Roland VersaWorks

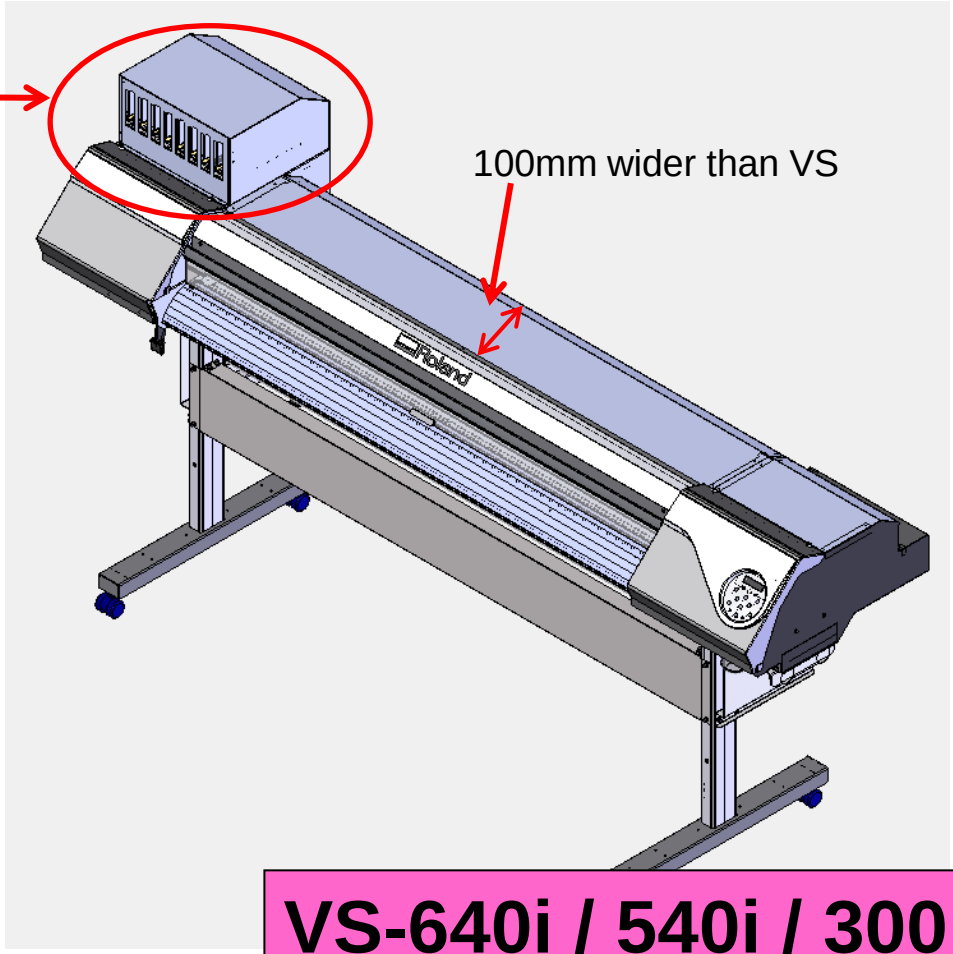


- Specifications

	VS-640i	VS-540i	VS-300i
			
Acceptable media width	210 ～ 1625mm	210 ～ 1371mm	182 ～ 762mm
Printable width	1600mm	1346mm	736mm
Loadable media weight	40kg	30kg	25kg
External dimension	2575[W] x 795[D] x 1270[H]mm	2315[W] x 795[D] x 1270[H]mm	1700[W] x 795[D] x 1270[H]mm
Weight with stand	140 Kg	130 Kg	100 Kg
Package Size and Weight	2720 [W] x 830 [D] x 760[H]mm Weight: 197Kg	2460 [W] x 830 [D] x 760[H]mm Weight: 178Kg	1860 [W] x 830 [D] x 760[H]mm Weight: 140Kg
Power requirements	AC 100 to 120 V ±10%, 7.8 A, 50/60 Hz or AC 220 to 240 V ±10%, 4.0 A, 50/60 Hz	AC 100 to 120 V ±10%, 7.5 A, 50/60 Hz or AC 220 to 240 V ±10%, 3.8 A, 50/60 Hz	AC 100 to 120 V ±10%, 5.1 A, 50/60 Hz or AC 220 to 240 V ±10%, 2.6 A, 50/60 Hz
Power consumption (During operation) (Sleep mode)	Approx. 1,044W Approx. 14.5 W	Approx. 955 W Approx. 15.1 W	Approx. 670 W Approx. 14.4 W

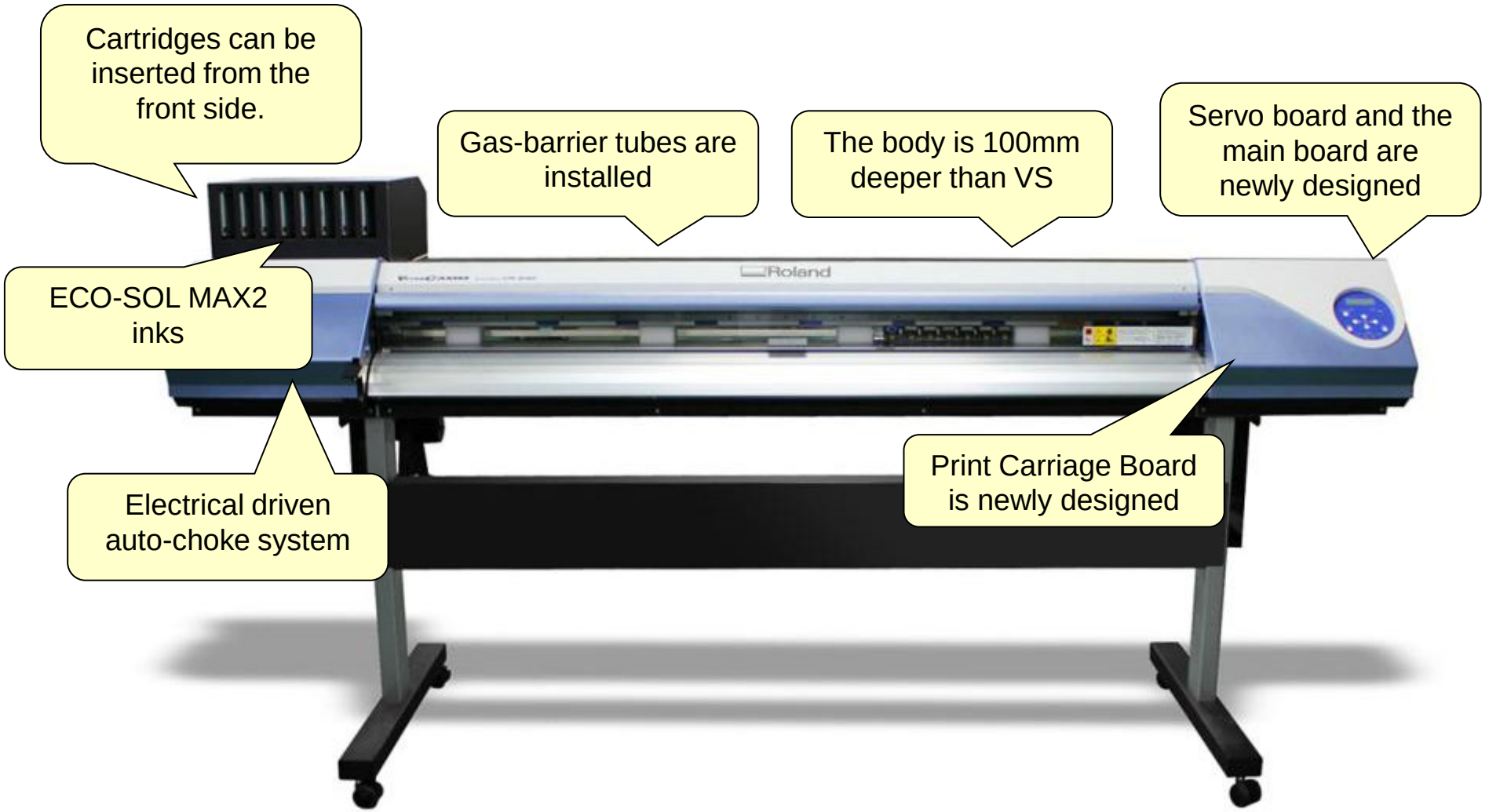
- Exterior

VS-640 / 540 / 420 / 300

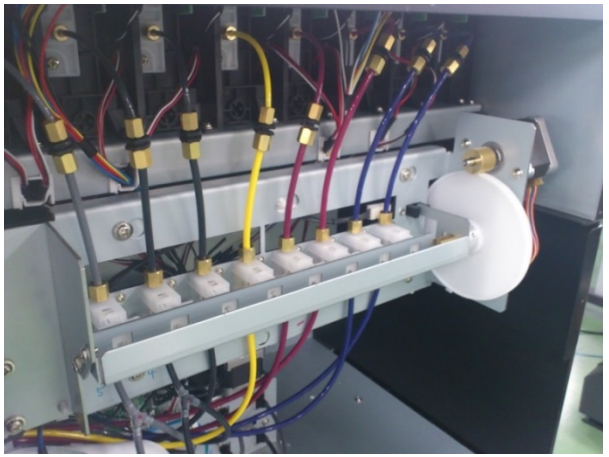


VS-640i / 540i / 300i

- Changed points from current VS series



- Ink Cartridge Slots
  - Settable from the front side.



- Choke System
  - Newly Designed
    - Electrical-driven, motorized mechanism.
    - Open-close movement is sensor-detected.

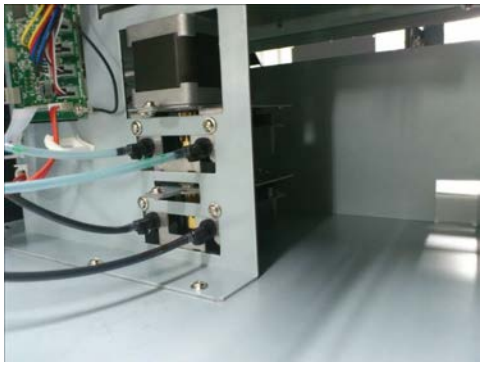
Since the direction of the cartridge insertion is changed to the horizontal and also ink circulation can be done automatically, the “shake the cartridges” message does not show up.

- Ink Circulation System

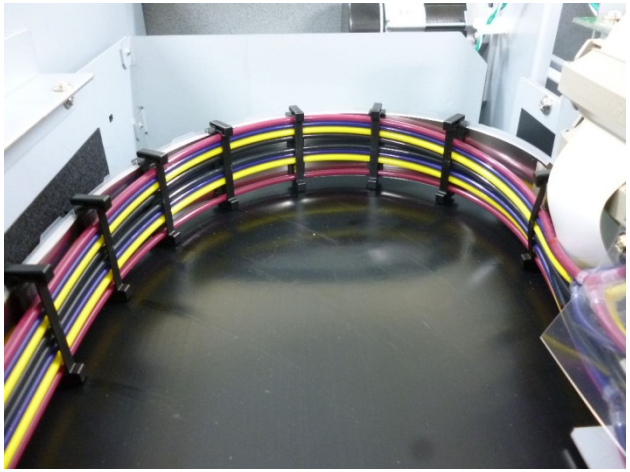
  To avoid the ink settlement, circulation system is installed for ink lines of #7 and #8 slots (slots for White and Metallic silver ink)

  - Circulation takes effect only when WH or MT is used.
  - Two pumps for Ink circulation
    - One motor for ink circulation under ink cartridge slots

      *This system runs only when White or Metallic, or the both ink cartridges are set on the printer.



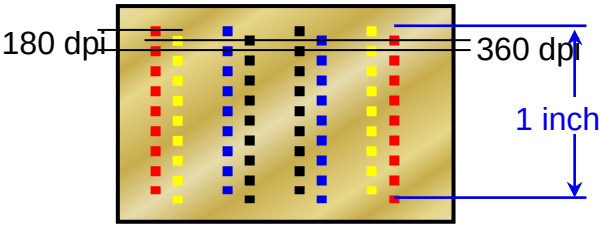
- Tube
  - Tubes are not connected to each other.
  - Gas-barrier tubes for a stable operation.
  - Broad inner structure for the reliable tubes with larger flexion.



- Print Head （same as the VS Series.）
  - Piezo Inkjet Head
    - Capable of producing 7 different sized dots.
      (One print mode uses the appropriate 3 sizes.)
  - One Print Head for One Printer
  - 180 nozzles / line (8 lines)
  - Nozzle Pitch : 360 dpi
  - Print Width : Approx. 1 inch
  - Head Rank
    - 24 digits in 3 lines

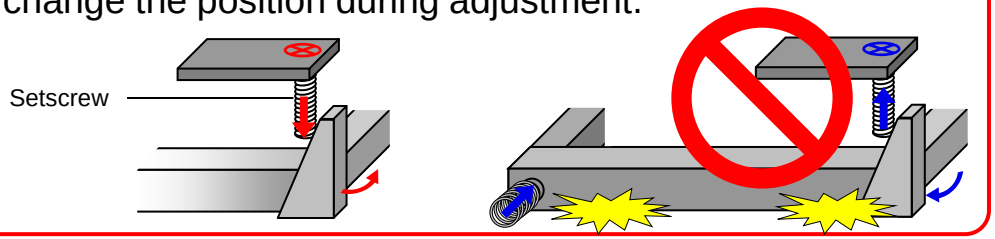
      Example :

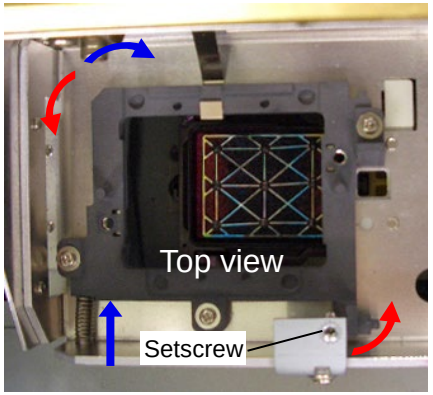
      197997F8 (1/3)
      090928D9 (2/3)
      19C9FT01 (3/3)
    - Visible even after the print head is fixed.

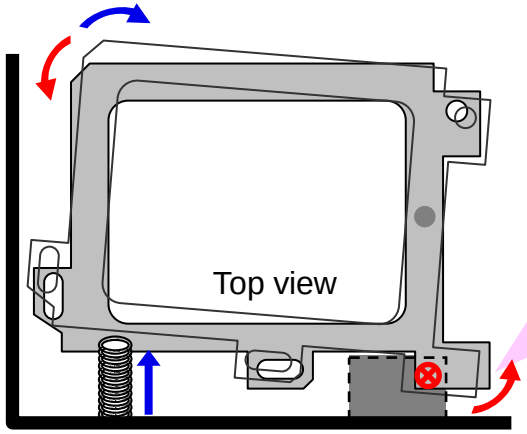


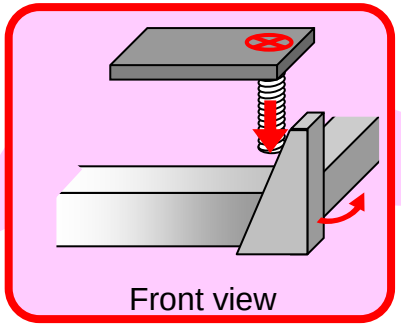
- Print Head Alignment (Same as the VS Series.)
  - Only BIAS and Bi-directional Adjustments are required.
    - Head adjuster determines the proper position for BIAS. (Vertical or Horizontal adjustment is not necessary because one print head has eight nozzle lines.)

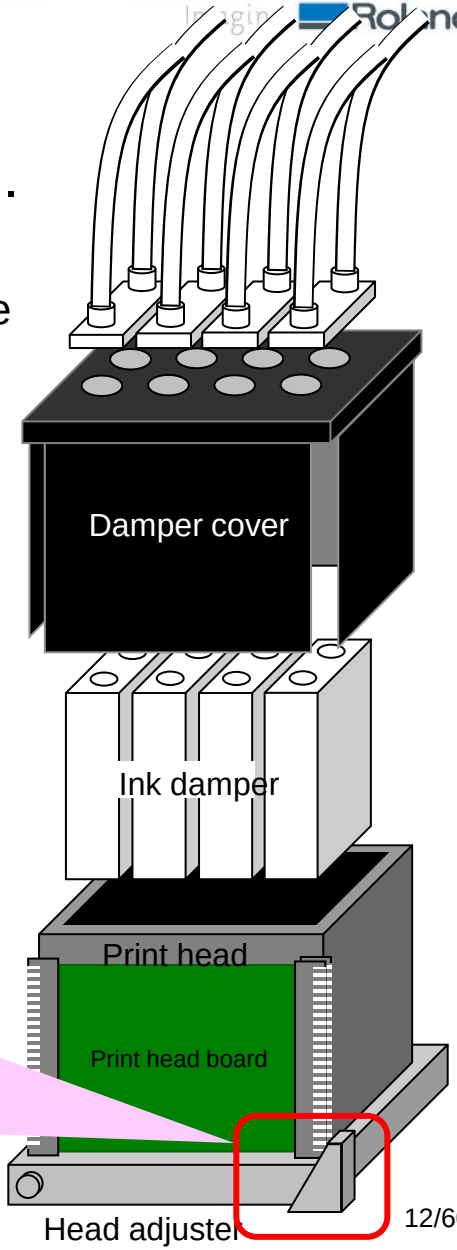
When doing BIAS adjustment, always **adjust the position by tightening** the setscrew. If you adjust the position by loosening the setscrew, it is not the proper position because the spring can not push it back fully due to the friction and may change the position during adjustment.





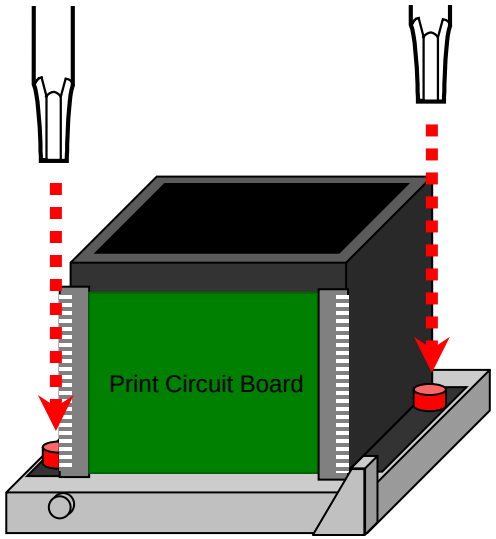




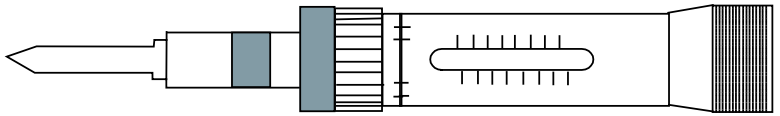


- Fixing of Print Head（same as the VS Series.）

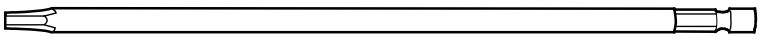
  The print head is fixed on the head adjuster with 2 hex nuts. These 2 hex nuts should be tightened with 0.6N torque controlled hex driver.



ST-056 TORQUE DRIVER NS

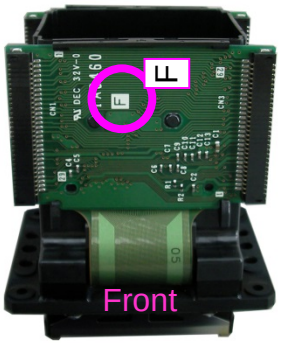


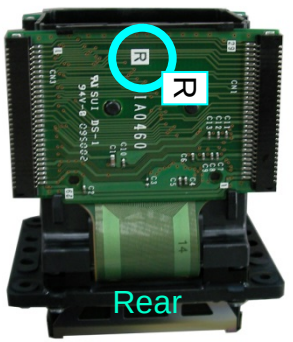
1000006902 TOOL,BIT HEXAGONAL ST-118



!! IMPORTANT !!

The print head has the fitting direction.
The PCB displays the direction.
[F] for the front and [R] for the rear side.
Head Rank comes at left side.





- Ink Damper

  It cuts the positive ink pressure by closing the inner valve. When the ink is used, the valve is opened to supply ink to the print head, and the valve closes with the ink pressure in itself.

  - Two ink lines per each damper
  - Not necessary to replace the ink damper when replacing the print head.
  - Positive ink pressure
    - The ink damper can cut the Ink pressure with the valve.

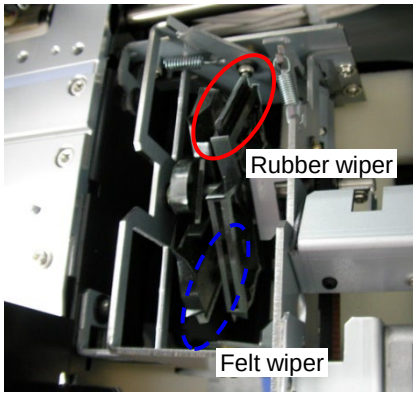
(Filter side)

(Flipped)

For Ink Damper replacement..
- Before disconnecting the ink tube from ink dampers, close the choke valve to stop ink flowing.
- Do not push the valve over the film. Otherwise, ink drops out from the bottom.

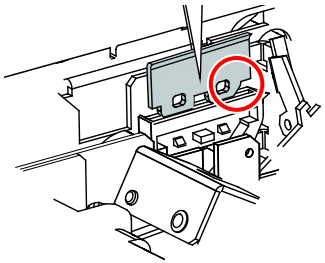
Wiper Unit

Wiper unit works for wiping and scraping with one motor.



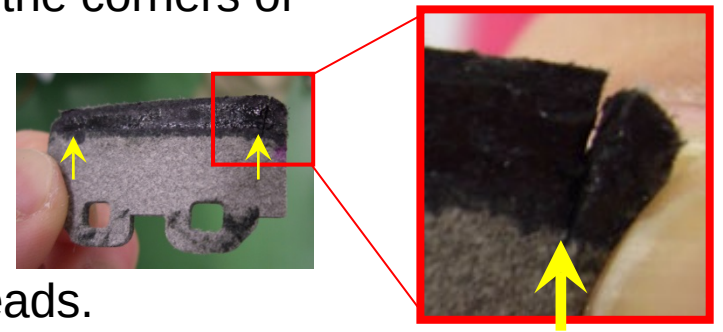
Wiping with Rubber Wiper

- Rubber wiper wipes the print head's surface.
- It has the fitting direction.
  * Fitting in a wrong direction may cause improper wiping, resulting in clogged nozzles.



Wiping with Felt Wiper

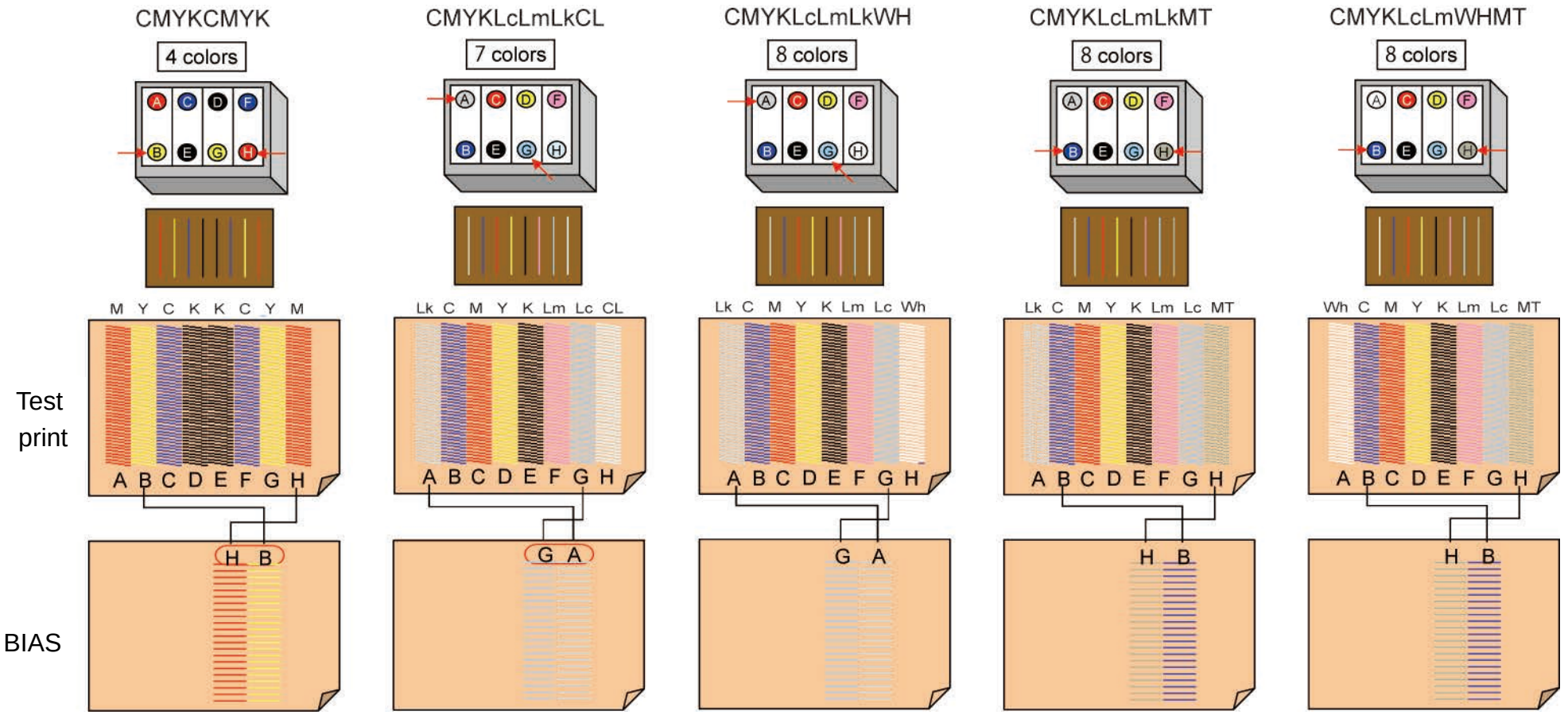
- Felt wiper does not do "rubbing".
  It is just for absorbing ink which the Rubber wiper collects.
- It does not have the fitting direction.
- It has slits at both sides, that are for touching the corners of the print head.
  Peck report says "Wiping times (rubber)" and "Felt wiping times (felt)".



Scraping

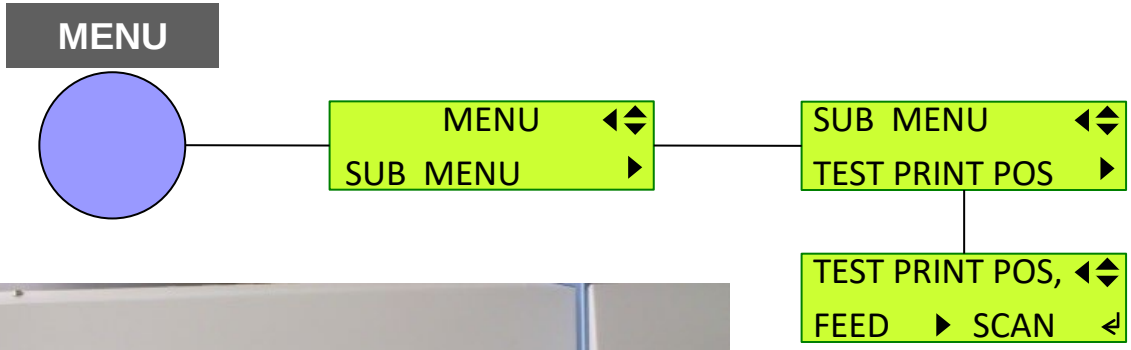
- The scraper collects the ink from the wiper heads.
  The scraper is positioned underneath the wipers.

- Test Print, BIAS and Nozzle line

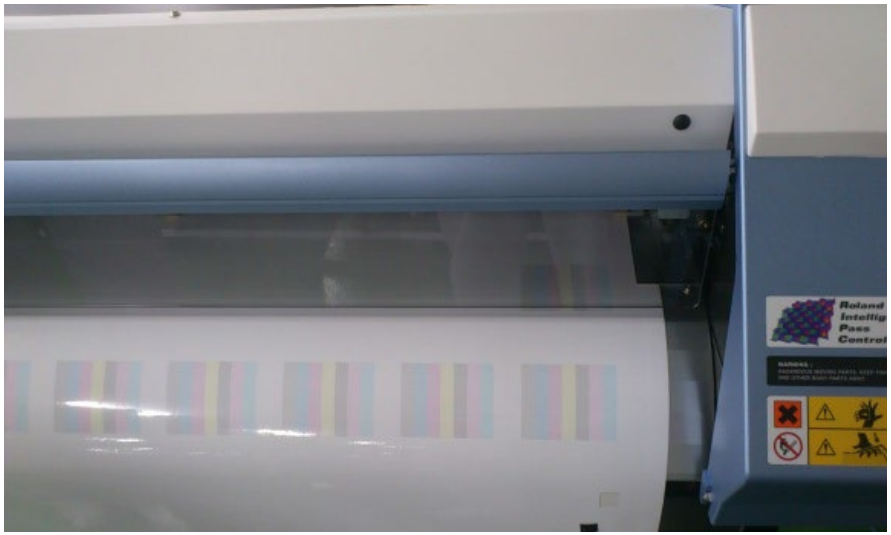


Align the BIAS exactly straight. Half-dot misalignment may affect printing result.

- Test Pattern for Nozzles is Printed in the Scanning Direction NEW



*Default: FEED



When the test pattern reaches the left end of the media,

the next pattern is printed on the right side from the next row.

There is a risk that the ink comes off and is transferred to pinch rollers if a poor drying media is being used.

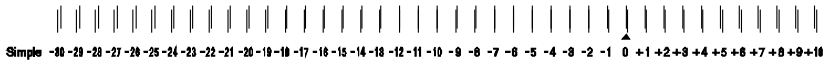
- Test Patterns: colors will be different depending on ink configurations.
  - Bi-Direction
    Simple and Detail setting are available in the user menu.
    - Simple
    - Detail
      - 4 patterns from No.1 to No.4

      The printing size becomes smaller than VS.

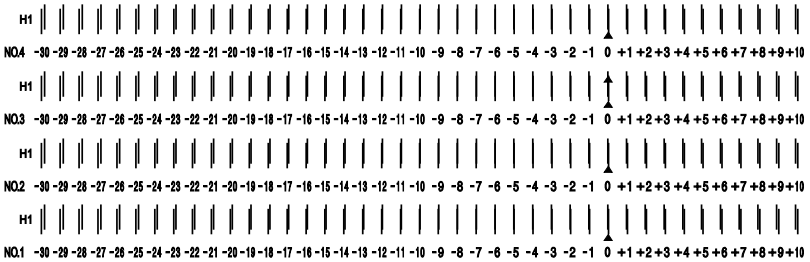
      User mode: to No.4.

      Service mode: to No.8

Simple

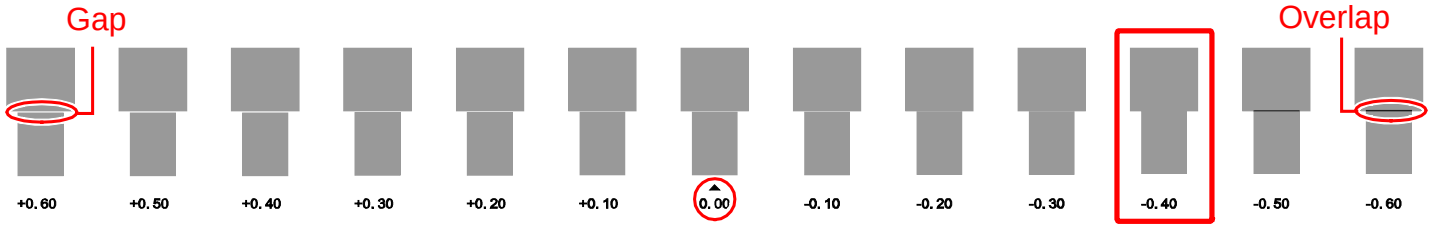


Detail



Conduct Bi-direction adjustment when the machine is installed.
Pigment ink is used to adjust the bi-direction as a factory default. Since there is a big gap in the result of bi-direction adjustment between MAX2 and Pigment, conduct the bi-direction adjustment from the SERVICE MENU.

- Calibration



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Layered Printing
Blend Printing

- Printing speed of standard mode (using the WH and MT)

Generic Vinyl 1 [MT] **Generic Banner 1 [MT]**	dpi Bi/Uni [pass]	VS-640i	VS-540i	VS-300i
MetallicSilver	720x720 Bi [6]	3.7 m²/h (39.6 sqft/h)	3.5 m²/h (37.8 sqft/h)	3.0 m²/h (32.6 sqft/h)
CMYKLcLmLkMt	720x720 Uni [6]	2.8 m²/h (29.9 sqft/h)	2.7 m²/h (28.5 sqft/h)	2.3 m²/h (24.3 sqft/h)
Mt -> CMYKLcLmLk	720x720 Bi [6]	1.6 m²/h (17.6 sqft/h)	1.6 m²/h (12.6 sqft/h)	1.3 m²/h (14.3 sqft/h)

Generic Vinyl 2 [MT] **Generic Banner 2 [MT]**				
MetallicSilver	720x720 Bi [8]	2.7 m²/h (29.4 sqft/h)	2.6 m²/h (28.3 sqft/h)	2.3 m²/h (24.3 sqft/h)
CMYKLcLmLkMt	720x720 Uni [8]	2.1 m²/h (22.1 sqft/h)	2.0 m²/h (21.4 sqft/h)	1.7 m²/h (18.2 sqft/h)
Mt -> CMYKLcLmLk	720x720 Bi [8]	1.2 m²/h (12.9 sqft/h)	1.2 m²/h (12.6 sqft/h)	1.0 m²/h (10.9 sqft/h)

Generic Clear		VS-640i	VS-540i	VS-300i
white	720x720 Bi [12]	3.4 m²/h (36.9 sqft/h)	3.4 m²/h (36.1 sqft/h)	2.8 m²/h (30.1 sqft/h)
w -> CMYKLcLmLk CMYKLcLmLk -> w	720x720 Bi [12]	1.5 m²/h (15.6 sqft/h)	1.4 m²/h (15.1 sqft/h)	1.2 m²/h (13.3 sqft/h)

Generic Clear [MT]				
w -> CMYKLcLmMt CMYKLcLmMt -> w	720x720 Bi [16]	0.6 m²/h (6.4 sqft/h)	0.6 m²/h (6.2 sqft/h)	0.5 m²/h (5.4 sqft/h)
Mt -> CMYKLcLm CMYKLcLm -> Mt	720x720 Bi [8]	1.2 m²/h (12.9 sqft/h)	1.2 m²/h (12.5 sqft/h)	1.0 m²/h (10.9 sqft/h)

- Printing Speed (using the 4 colors or 7 colors)

Generic Vinyl 1

4 colors	dpi Bi/Uni [pass]	VS-640i	VS-540i	VS-300i
High Speed	540x720 Bi [5]	13.1 m²/h (140.2 sqft/h)	12.3 m²/h (131.3 sqft/h)	9.8 m²/h (105.7 sqft/h)
Standard	720x720 Bi [6]	10.9 m²/h (116.0 sqft/h)	10.2 m²/h (109.4 sqft/h)	8.2 m²/h (88.0 sqft/h)
High Quality	1440x720 Bi [8]	4.4 m²/h (47.8 sqft/h)	4.3 m²/h (46.3 sqft/h)	3.7 m²/h (26.3 sqft/h)
7 colors				
High Speed	540x720 Bi [10]	6.4 m²/h (68.2 sqft/h)	6.1 m²/h (65.9 sqft/h)	4.9 m²/h (52.7 sqft/h)
Standard	720x720 Bi [12]	5.4 m²/h (56.6 sqft/h)	5.1 m²/h (54.9 sqft/h)	4.1 m²/h (43.9 sqft/h)
High Quality	1440x720 Bi [12]	2.9 m²/h (31.5 sqft/h)	2.9 m²/h (31.0 sqft/h)	2.4 m²/h (26.3 sqft/h)

Generic Vinyl 2

4 colors	dpi Bi/Uni [pass]	VS-640i	VS-540i	VS-300i
High Speed	540x720 Bi [8]	8.1 m²/h (85.7 sqft/h)	7.6 m²/h (82.1 sqft/h)	6.1 m²/h (65.9 sqft/h)
Standard	720x720 Bi [8]	6.7 m²/h (71.7 sqft/h)	6.4 m²/h (68.4 sqft/h)	5.2 m²/h (56.1 sqft/h)
High Quality	1440x720 Bi [10]	3.5 m²/h (38.1 sqft/h)	3.5 m²/h (37.1 sqft/h)	2.9 m²/h (31.5 sqft/h)
7 colors				
High Speed	540x720 Bi [16]	4.1 m²/h (43.0 sqft/h)	3.8 m²/h (41.0 sqft/h)	3.1 m²/h (32.9 sqft/h)
Standard	720x720 Bi [16]	3.4 m²/h (36.2 sqft/h)	3.2 m²/h (34.2 sqft/h)	2.6 m²/h (28.0 sqft/h)
High Quality	1440x720 Bi [20]	1.7 m²/h (18.7 sqft/h)	1.7 m²/h (18.5 sqft/h)	1.5 m²/h (15.8 sqft/h)

- Printing Speed (using the 4 colors or 7 colors)

Generic Banner 1

4 colors	dpi Bi/Uni [pass]	VS-640i	VS-540i	VS-300i
Billboard	360x720 Bi [2]	26.9 m²/h (288.9 sqft/h)	25.9 m²/h (278.6 sqft/h)	*Not available*
High Speed	360x720 Bi [3]	18.0 m²/h (193.8 sqft/h)	17.2 m²/h (184.6 sqft/h)	
Standard	720x720 Bi [5]	12.9 m²/h (138.7 sqft/h)	12.1 m²/h (131.3 sqft/h)	
High Quality	1440x720 Bi [6]	5.9 ㎡/h (63.3 sqft/h)	5.7 m²/h (61.8 sqft/h)	
7 colors				
High Speed	360x720 Bi [6]	8.9 m²/h (96.1 sqft/h)	8.5 m²/h (91.4 sqft/h)	
Standard	720x720 Bi [10]	6.4 m²/h (69.1 sqft/h)	6.1 m²/h (65.9 sqft/h)	
High Quality	1440x720 Bi [12]	2.9 m²/h (31.5 sqft/h)	2.9 m²/h (31.0 sqft/h)	

Generic Banner 2

4 colors	dpi Bi/Uni [pass]	VS-640i	VS-540i	VS-300i
High Speed	540x720 Bi [6]	10.7 m²/h (114.6 sqft/h)	10.2 m²/h (109.4 sqft/h)	*Not available*
Standard	720x720 Bi [8]	6.6 m²/h (71.3 sqft/h)	6.4 m²/h (68.4 sqft/h)	
High Quality	1440x720 Bi [8]	4.4 m²/h (47.5 sqft/h)	4.3 m²/h (46.3 sqft/h)	
7 colors				
High Speed	540x720 Bi [16]	5.3 m²/h (56.9 sqft/h)	5.1 m²/h (54.9 sqft/h)	
Standard	720x720 Bi [16]	3.4 m²/h (36.2 sqft/h)	3.2 m²/h (34.2 sqft/h)	
High Quality	1440x720 Bi [16]	2.2 m²/h (24.0 sqft/h)	2.2 m²/h (23.1 sqft/h)	

Ink Consumption for 1m²

Generic Vinyl 1		VS-640i / 540i	VS-300i
4 Colors	High Speed	3.76 cc	3.57 cc
	Standard	3.84 cc	3.55 cc
	High Quality	3.99 cc	3.55 cc
6 Colors	High Speed	5.02 cc	4.74 cc
	Standard	5.17 cc	5.06 cc
	High Quality	5.96 cc	5.75 cc
7 Colors	High Speed	5.19 cc	4.69 cc
	Standard	5.39 cc	5.15 cc
	High Quality	6.32 cc	6.1 cc
8 Colors	Metallic Silver (ST)*	7.57 cc	
	Metallic Silver (HQ)*	8.45 cc	
	White (ST)*	12.39 cc	
	White (HQ)*	24.78 cc	

Generic Banner 1		VS-640i / 540i
4 Colors	Billboard	5.2 cc
	High Speed	5.13 cc
	Standard	5.73 cc
	High Quality	5.89 cc
6 Colors	High Speed	7.15 cc
	Standard	7.22 cc
	High Quality	8.14 cc
7 Colors	High Speed	7.68 cc
	Standard	7.64 cc
	High Quality	8.16 cc

RIP : Roland VersaWorks
Data : ISO N5A
Size : A0 (841x1189mm as 1m²)
FULL WIDTH S : FULL

*A solid colored square is printed instead of ISO N5A.

Rev.1.1

- Ink consumption comparison between VS-640 and VS-640i (Generic Vinyl 1 mode)

The amount of ink consumption is significantly reduced by optimizing the profile and dot size

Print : VS-640(4c),VS-640i(4c)
RIP : Roland VersaWorks
Data : ISO N2A
Size : A0 (841x1189mm as 1m²)
FULL WIDTH S : FULL

Print mode	Model	Total (cc)	CY (cc)	MG (cc)	YE (cc)	BK (cc)	Reduction rates
Generic Vinyl 1 Standard	VS-640i (4C)	7.62	1.53	2.58	1.88	1.62	22.2%
	VS-640 (4C)	9.80	2.01	4.04	2.01	1.36	
Generic Vinyl 1 High Quality	VS-640i (4C)	7.97	1.53	2.78	2.01	1.64	22.2%
	VS-640 (4C)	10.24	2.03	4.47	2.73	1.01	
Generic Vinyl 1 Standard	VS-640i (4C)	6.68	1.26	2.17	1.62	1.63	34.6%
	VS-640 (4C)	10.21	2.10	4.40	2.73	0.97	
Generic Vinyl 2 High Quality	VS-640i (4C)	6.81	1.26	2.26	1.69	1.61	36.7%
	VS-640 (4C)	10.75	2.19	4.78	3.02	0.76	

The above figures are based on calculation by RVW.

Rev.1.1

- Ink consumption comparison between VS-640 and VS-640i (Generic Banner 1 mode)

Print : VS-640(4c),VS-640i(4c)
RIP : Roland VersaWorks
Data : ISO N2A
Size : A0 (841x1189mm as 1m²)
FULL WIDTH S : FULL

The amount of ink consumption is significantly reduced by optimizing the profile and dot size

Print mode	Model	Total (cc)	CY (cc)	MG (cc)	YE (cc)	BK (cc)	Reduction rates
Generic Banner 1 Standard	VS-640i (4C) (720*720)	12.04	1.90	3.63	3.92	2.58	1.7%
	VS-640 (4C) (540*720)	12.25	2.45	4.78	3.21	1.80	
Generic Banner 1 High Quality	VS-640i (4C)	11.96	2.19	3.59	3.47	2.70	11.1%
	VS-640 (4C)	13.45	2.77	5.48	3.70	1.49	
Generic Banner 2 Standard	VS-640i (4C) (720*720)	8.43	1.72	2.97	2.05	1.69	12.9%
	VS-640 (4C) (720*720)	9.68	2.04	3.61	2.01	2.02	
Generic Banner 2 High Quality	VS-640i (4C)	8.84	1.79	3.19	2.23	1.64	29.0%
	VS-640 (4C)	12.45	2.72	4.94	3.00	1.80	

The above figures are based on calculation by RVW.

Rev.1.1

Ink consumption comparison between VS-640 and VS-640i

Print : VS-640(4c),VS-640i(4c)
RIP : Roland VersaWorks
Data : ISO N2A
Size : A0 (841x1189mm as 1m²)
FULL WIDTH S : FULL

CMYK CMYK

	Generic Vinyl 1			Generic Vinyl 2		
	High Speed	Standard	High Quality	High Speed	Standard	High Quality
VS-640i	7.45	7.62	7.97	6.73	6.68	6.81
VS-640	9.35	9.80	10.24	9.26	10.21	10.75
Reduction rates	20.3%	22.2%	22.2%	27.3%	34.6%	36.7%

	Generic Banner 1					Generic Banner 2			
	Billboard	High Speed	Standard 540*720	Standard 720*720	High Quality	Billboard	High Speed	Standard	High Quality
VS-640i	10.52	10.27		12.04	11.96	8.54	8.54	8.43	8.84
VS-640	12.22	11.10	12.25		13.45	10.92	10.92	9.68	12.45
Reduction rates	13.9%	7.5%	1.7%		11.1%	21.8%	21.8%	12.9%	29.0%

CMYKLcLm（Wh,MT）

	Generic Vinyl 1			Generic Vinyl 2		
	High Speed	Standard	High Quality	High Speed	Standard	High Quality
VS-640i	9.13	9.50	11.42	9.84	10.39	9.37
VS-640	13.97	14.79	16.15	14.22	15.52	15.81
Reduction rates	34.6%	35.8%	29.3%	30.8%	33.1%	40.7%

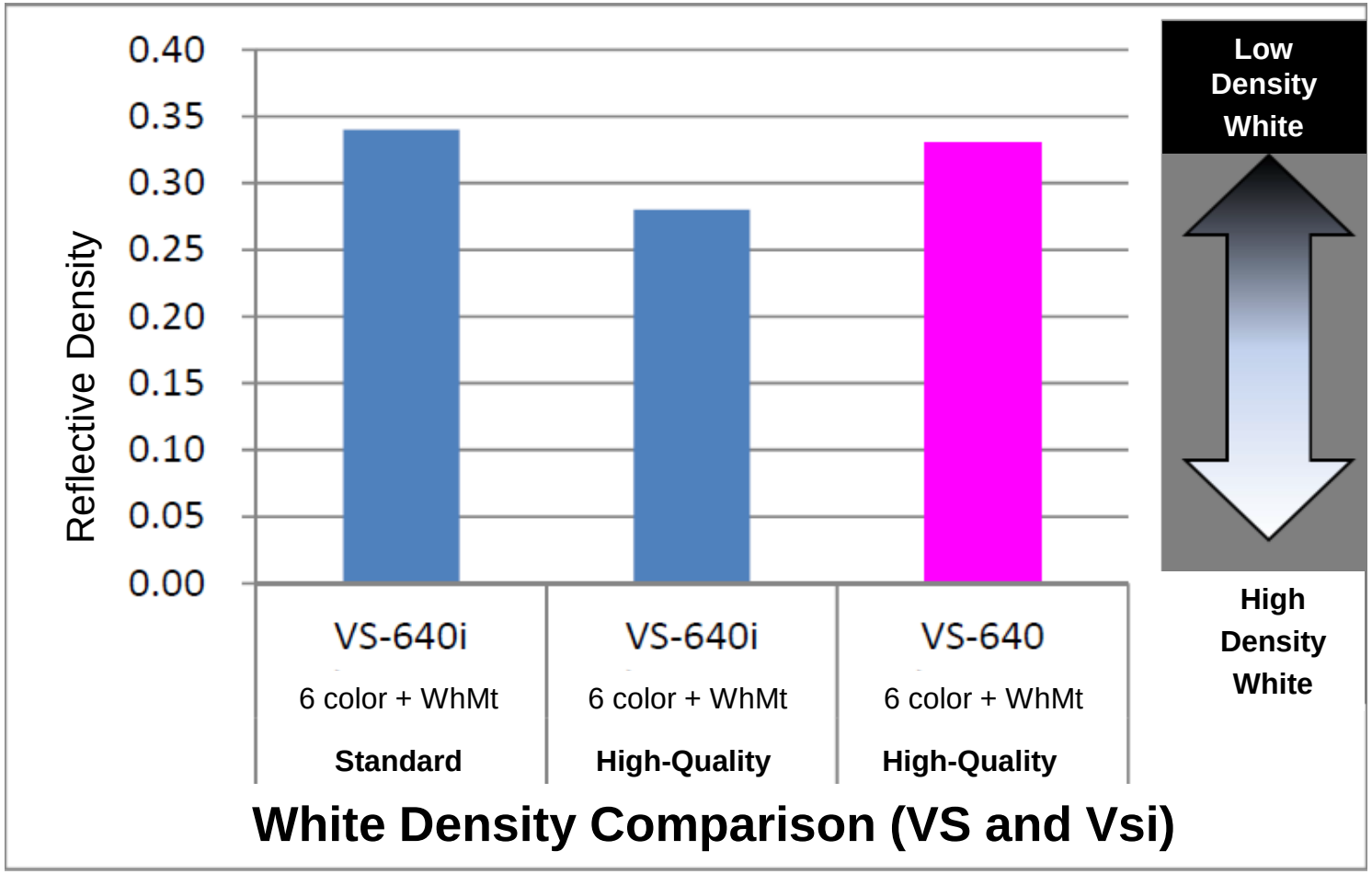
	Generic Banner 1				Generic Banner 2		
	High Speed	Standard 540*720	Standard 720*720	High Quality	High Speed	Standard	High Quality
VS-640i	13.73		14.31	16.16	11.23	12.22	12.60
VS-640	16.89	21.02		23.54	14.31	14.77	17.13
Reduction rates	18.7%	31.9%		31.4%	21.5%	17.3%	26.4%

The above figures are based on calculation by RVW.

Rev.1.1

Comparison of white density

The density of VS-640i standard mode is almost the same as VS-640 high quality mode.



White Density Comparison (VS and Vsi)

3. Ink

- ECO-SOL MAX2 Ink

  - Colors: C M Y K Lc Lm Lk White & Metallic
  - Capacity: 440cc (White and Metallic are 220cc)

Error message “WRONG CARTRIDGE” appears when the ECO-SOL MAX ink cartridges are inserted.

Usage of ESL4-CL(MAX2 cleaning liquid) and SL-CL(MAX cleaning liquid)

- ESL4-CL
  - Ink cartridge of 8th slot in 7 colors ink type
  - Head wash (transport)
- SL-CL
  - Initial FILL INK

ESL4-CL is required for washing ink lines which MAX2 ink was once installed in.

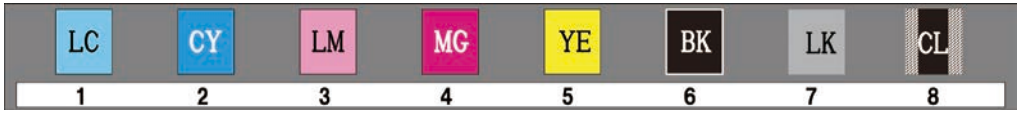
- Ink Type Settings

SELECT INK TYPE E-SOL MAX2 4C	SELECT INK TYPE E-SOL MAX2 7C	SELECT INK TYPE E-SOL MAX2 LkW	SELECT INK TYPE E-SOL MAX2 LkMT	SELECT INK TYPE E-SOL MAX2 WMT
CMYK CMYK	CMYKLcLmLk	CMYKLcLmLkWh	CMYKLcLmLkMt	CMYKLcLmWhMt

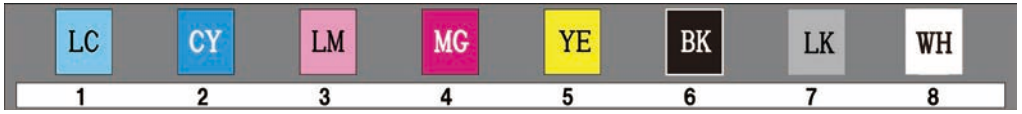
- Ink Slot Numbers and Ink Types

4 colors: CMYK CMYK

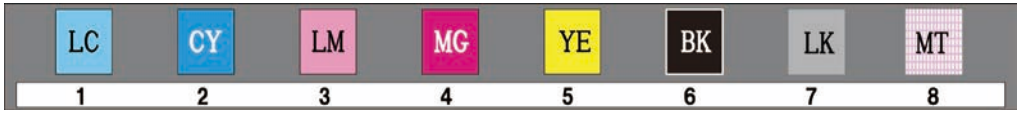
7 colors: CMYK LcLmLk



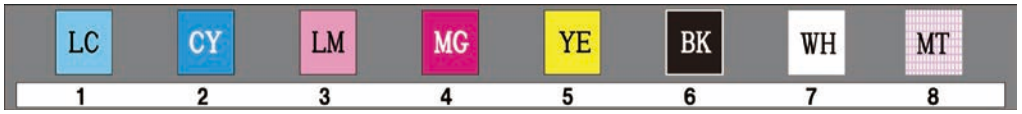
8 colosr: CMYK LcLmLkWh



8 colors: CMYK LcLmLkMT

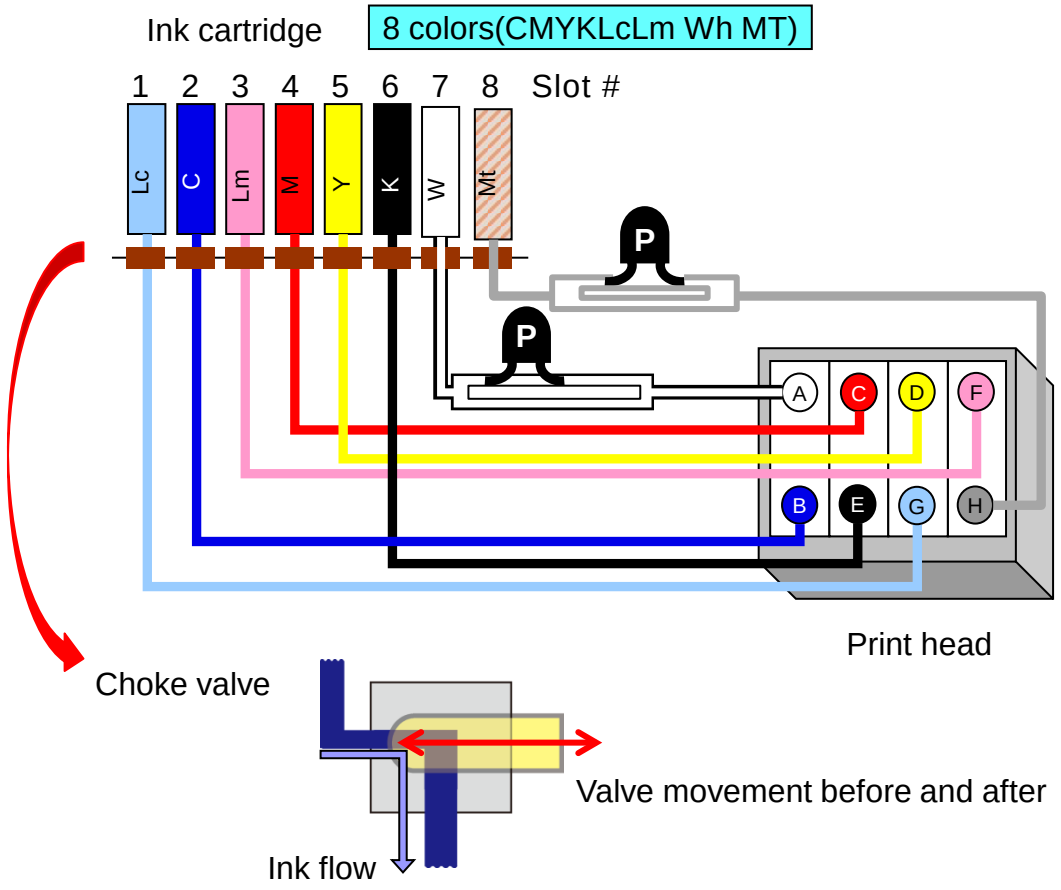


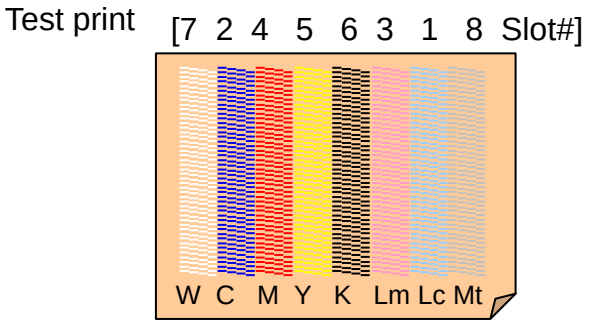
8 colors: CMYK LcLmWhMt

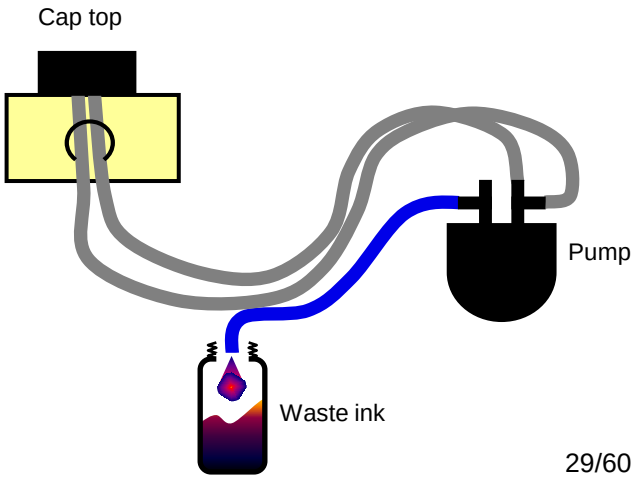


*ESL4-CL cartridge should be inserted for CL. If no cartridge is inserted, ink suction cannot be performed correctly and the head can be broken.

- Ink Lines (8 colors)
  - Ink cartridge -> Ink tube -> Damper and print head -> Pump -> Waste ink bottle

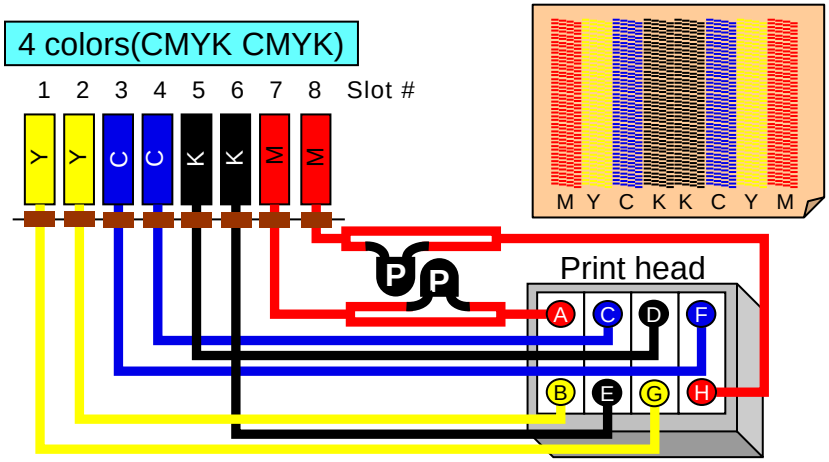




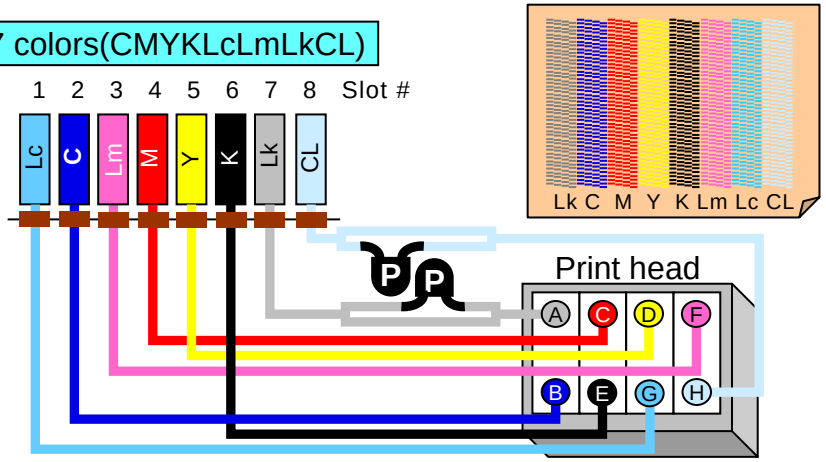


- Ink Line (4 colors , 7 colors , 8 colors)

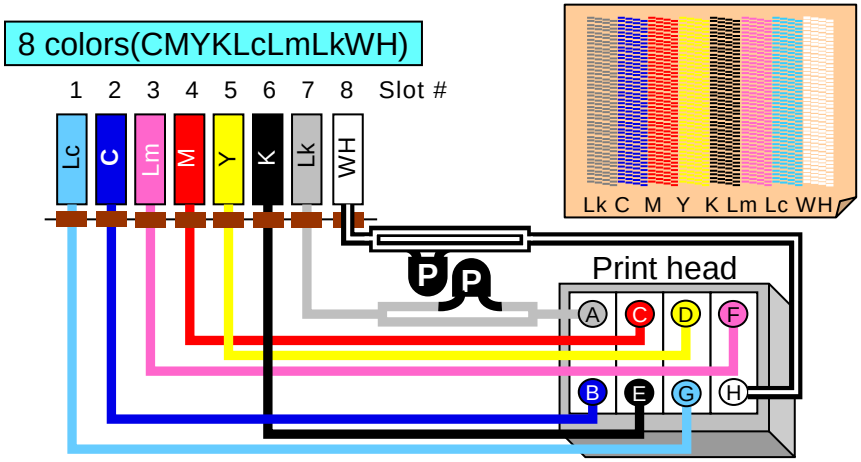
4 colors(CMYK CMYK)



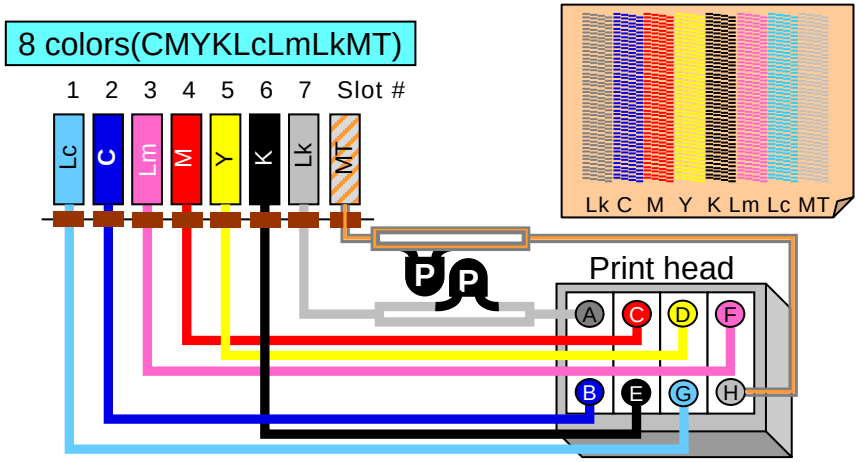
7 colors(CMYKLcLmLkCL)



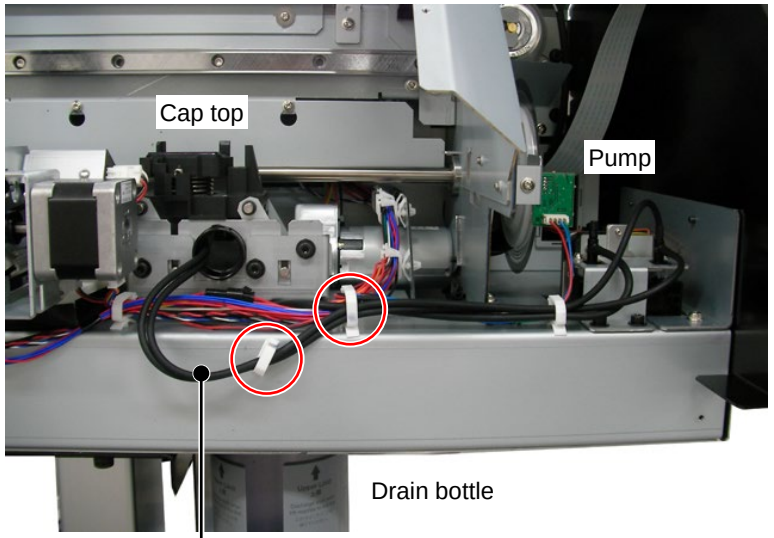
8 colors(CMYKLcLmLkWH)

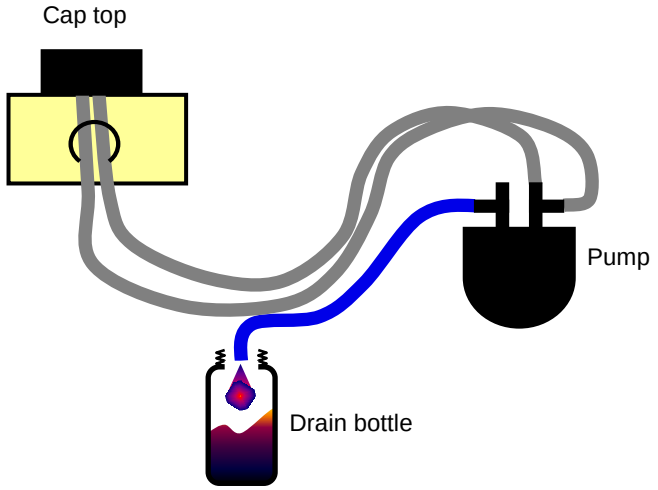


8 colors(CMYKLcLmLkMT)



- Pump Unit
  - 1 pump per each Cap Top
  - Life expectancy is 200,000-time running.
    It is equivalent to 3 years (if the machine is used 7days a week, 8 hours a day)
    Same pump as VS-series.





The drain tube from the Cap top must run through the front saddle and upper saddle as the picture shows. Otherwise, the cap may not function properly.

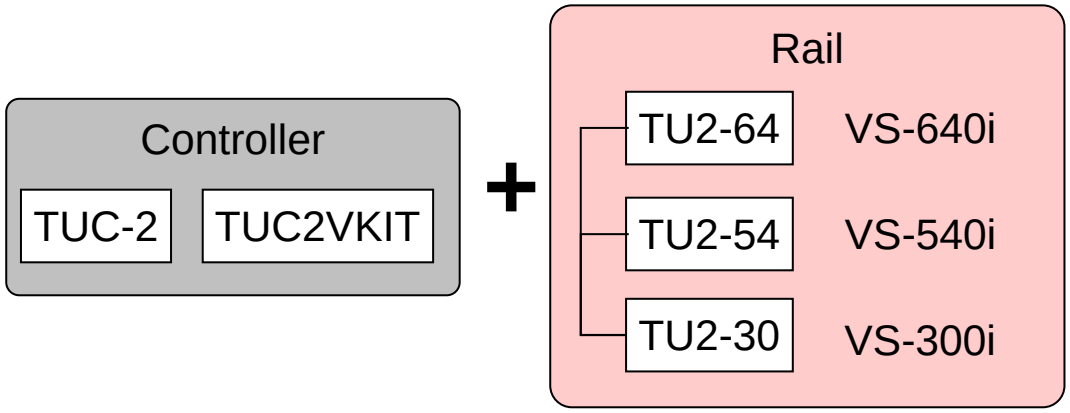
- Changing Ink Type
  - Direction
    - Operation of changing ink configurations has to be done by field engineer. End-users cannot change it by themselves.
  - For the ink lines whose ink will be changed to a different color, the following parts have to be replaced together with the ink tubes.
    - Damper
    - Cap top
    - Tube under Cap top
    - *Head (If the test print is OK, replacement is optional because the cost is high)
  - Required tools
    - New dummy cartridges 6pcs
    - SL-CL cartridges 2pcs (assuming tubes are already replaced)
    - Cleaning liquid and cleaning stick
  - Procedure

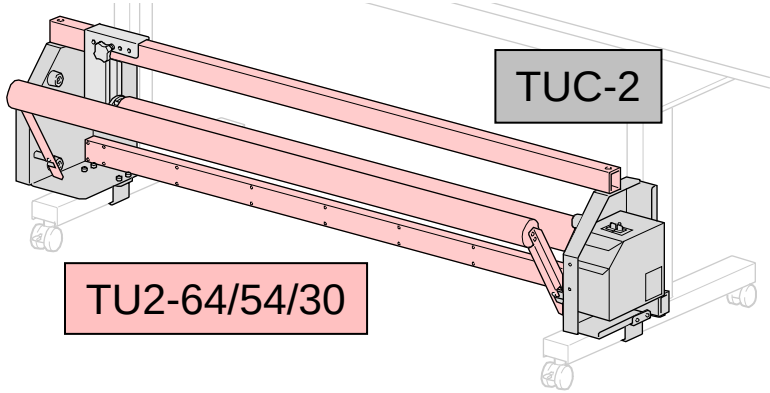
Remove ink Pump up ⇨ Replace ink line parts ⇨ Select New ink type ⇨ Manual Cleaning ⇨ Ink filling

5. Take-up Unit

- Take-up Unit (TUC-2)
  - Optional Take-up unit can be installed.
  - The dancer roller helps to feed the media straight and gives constant tension to the media.
  - Acceptable media weight is 30kg.

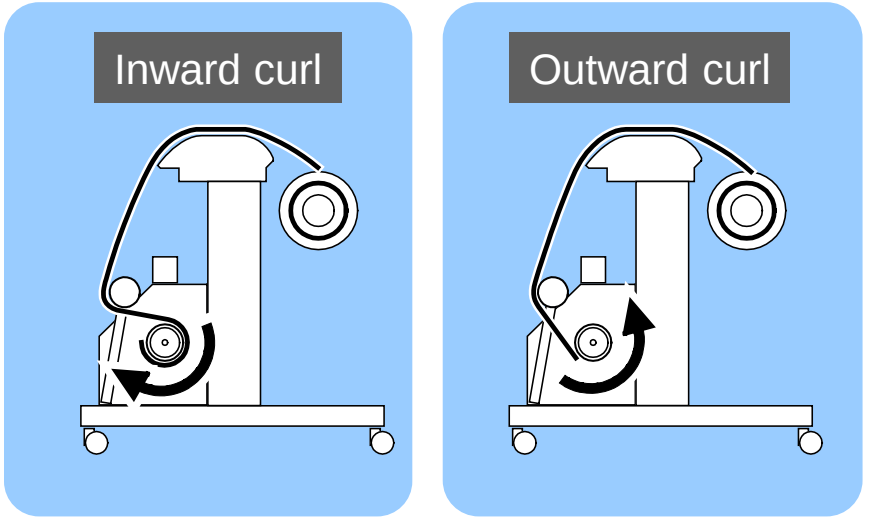
- Combinations





- Take-up Direction

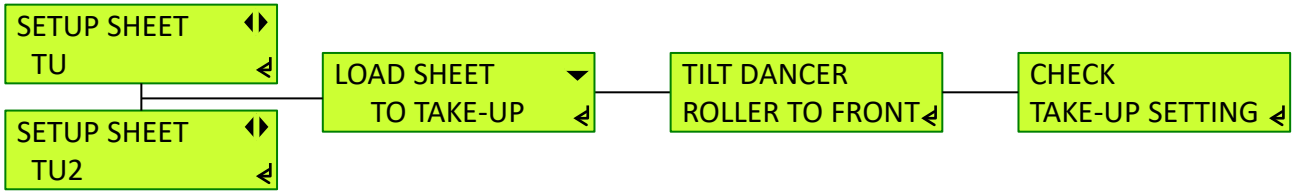
Take-up direction is selectable from inward curl and outward curl.



- [TU] and [TU2] Setup Mode

TU and TU2 Modes are equipped. The printer instructs the procedure to load the media correctly. This mode is only available when the cable of TUC-2 is connected to the printer.

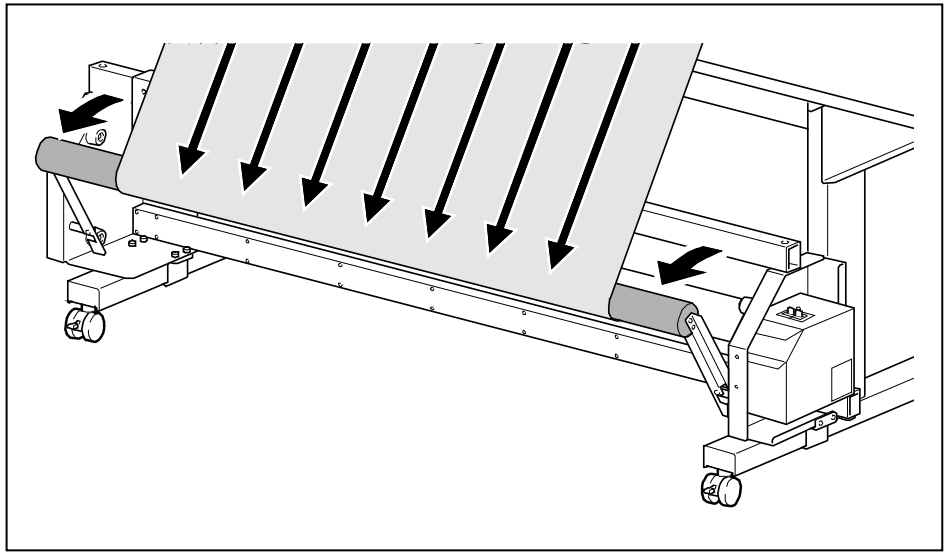
  - TU mode is for Print-only job.
  - TU2 mode is for Print&Cut job.



- Precautions when using Take-up unit

  It is very important to load the media as straight as possible and give even tension across the width of the media to keep taking up the media in good condition.

  - Inflexible media is more likely to skew. The media should be loaded very carefully.
  - Flexible media can be taken up in good condition more easily.



Unevenly taken up media

- Media Heating System

  Print Heater and Dryer are installed.

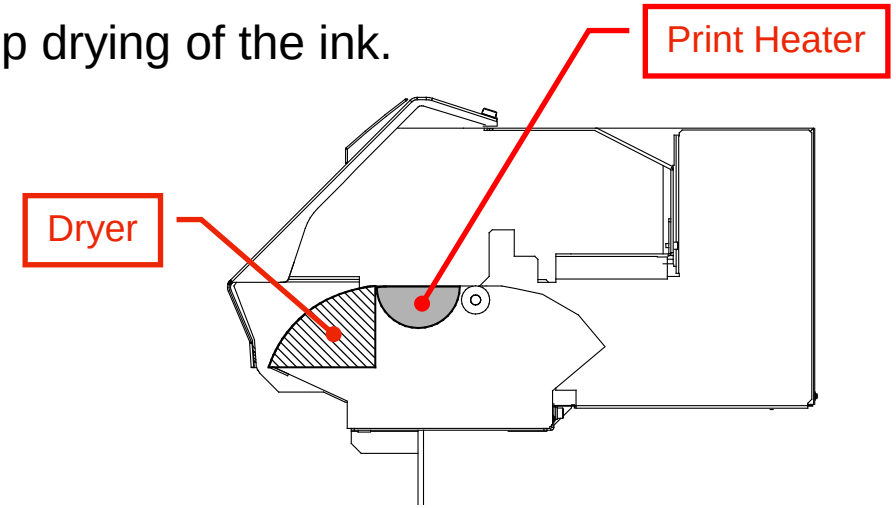
  - Print Heater

    It is used mainly to improve ink adhesion.

    > ! Not replaceable.
    > To reach this heater, many parts should be removed. And it destroys the printer's precision and accuracy.

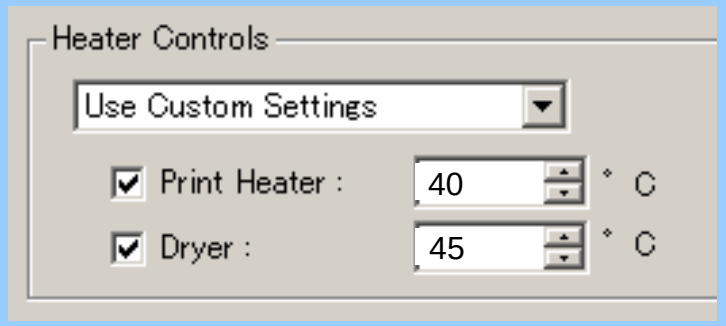
  - Dryer

    It is used to speed up drying of the ink.

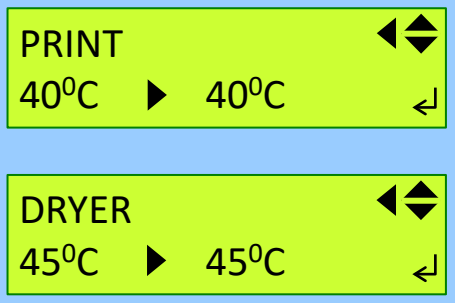


- Temperature Settings
  Temperature can be set from the operation panel of the machine or Roland VersaWorks.
  - Adjustable Range of Temperature
    - Print Heater From 30º to 45ºC **Default 40ºC
    - Dryer From 30º to 50ºC **Default 45ºC

Roland VersaWorks



Printer

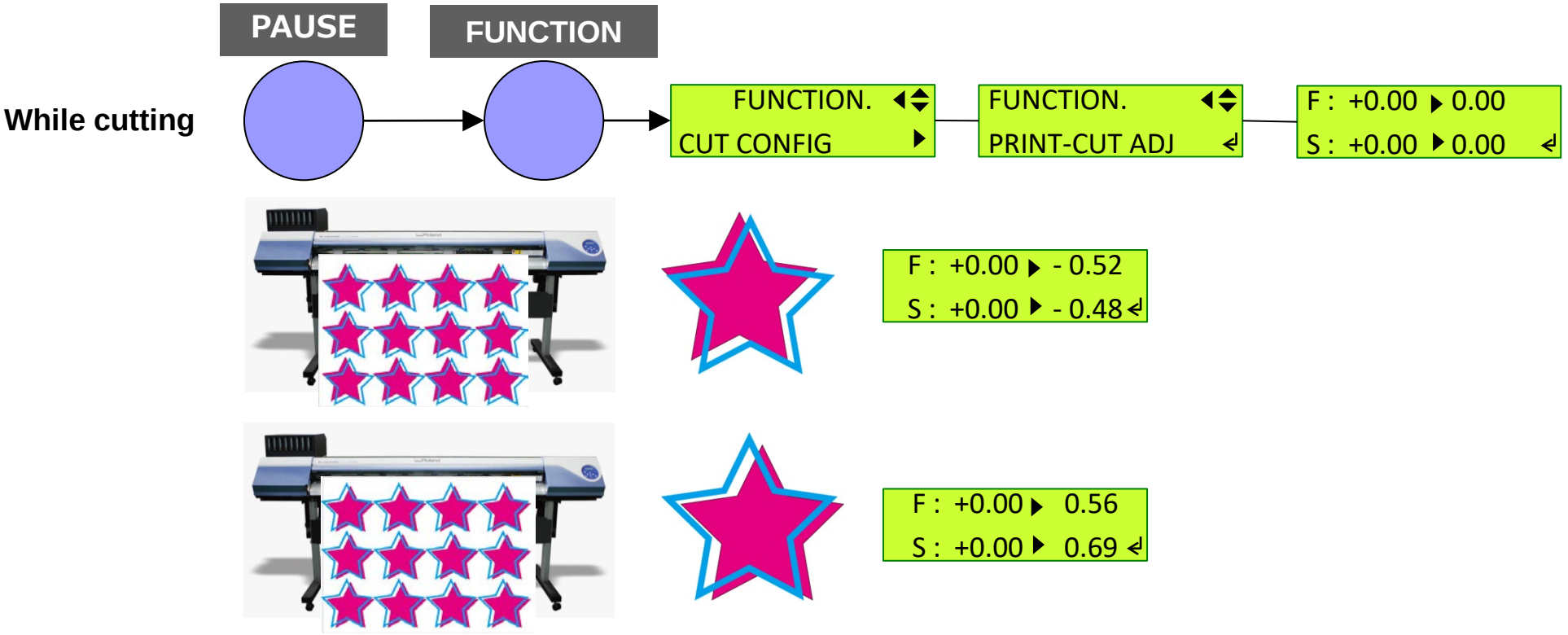


- Cutter Folder
  - Tool
    ZEC-U5022 is bundled.
  - Tool Holder
    XD-CH3 is bundled.
  - Blade Force
    30 to 300 gf
  - Cutting Speed
    1 to 30 cm/sec

XD-CH3

ZEC-U5022

- Cut Position Adjustment on the Fly NEW
  - Cut position can be adjusted while cutting is performed.



  - Print&Cut adjustment and Crop-Cut adjustment can now be set by 0.01mm.

- Cleaning Function
  - Cleaning Menu
    Three options depending on the nozzle conditions
  - Light Choke Cleaning
    For solving an unstable color.
  - Choke Cleaning
    SERVICE MENU -> SUB MENU -> CHOKE CL.
    Conduct it when more powerful cleaning than other lighter cleanings is required.
  - Ink Renewal
    Replace all the inks inside the tubes. This is equivalent to the Powerful Cleaning of XJ series. This can be conducted when the nozzle condition cannot be recovered by other lighter cleanings

Rev.1.2

	Ink Consumption	Time
NORMAL CL.	Approx. 1.7 cc	Approx. 1.8 min
MEDIUM CL.	Approx. 5.0 cc	Approx. 2 min
POWERFUL CL.	Approx. 14.5 cc	Approx. 2 min
LIGHT CHOKE CL.	Approx. 90.8 cc	Approx. 4 min
CHOKE CL.	Approx. 62.3 cc	Approx. 5 min
INK RENEWAL	Approx. 336.5 cc	Approx. 5 min

* This simulation is a reference. The ink consumption can be changed by usage of the machine.

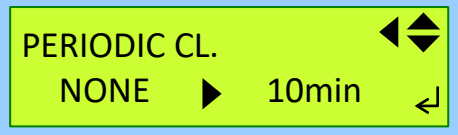
Cleaning Function

Periodical Cleaning

It is a function to perform cleaning during printing.

User Menu

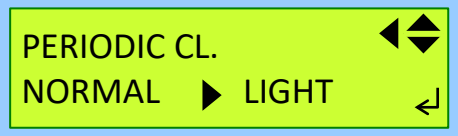
The timing of cleaning execution is selectable.



[10 min] to [990 min] :
The cleaning takes place when the cumulative printing time reaches the time set here.
[PAGE] : The cleaning takes place every time before printing starts.
[NONE] : Cleaning is not performed. (Default setting)

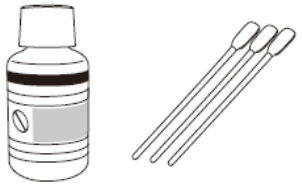
Service Menu

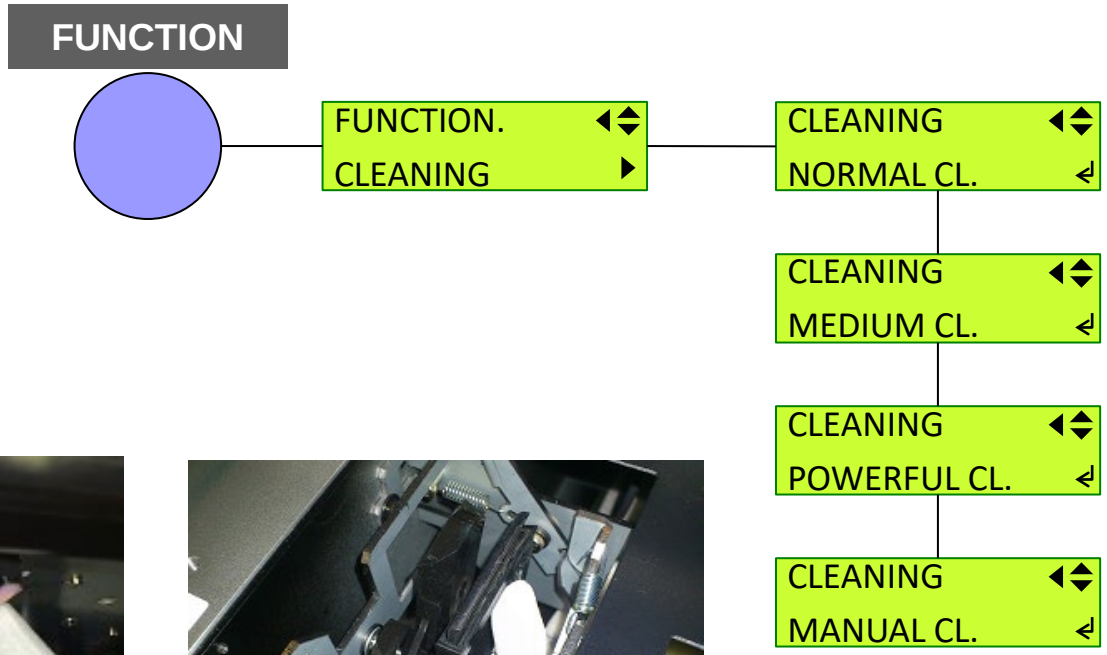
The cleaning type is selectable.

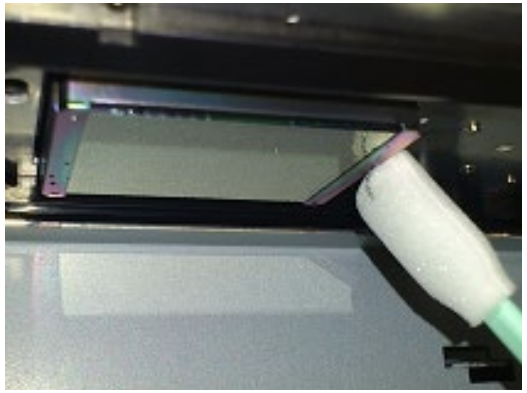


[WIPE] : wiping and flushing only
[LIGHT] : wiping and light evacuation only (Default setting)
[NORMAL] : regular normal cleaning
[MEDIUM] : regular medium cleaning

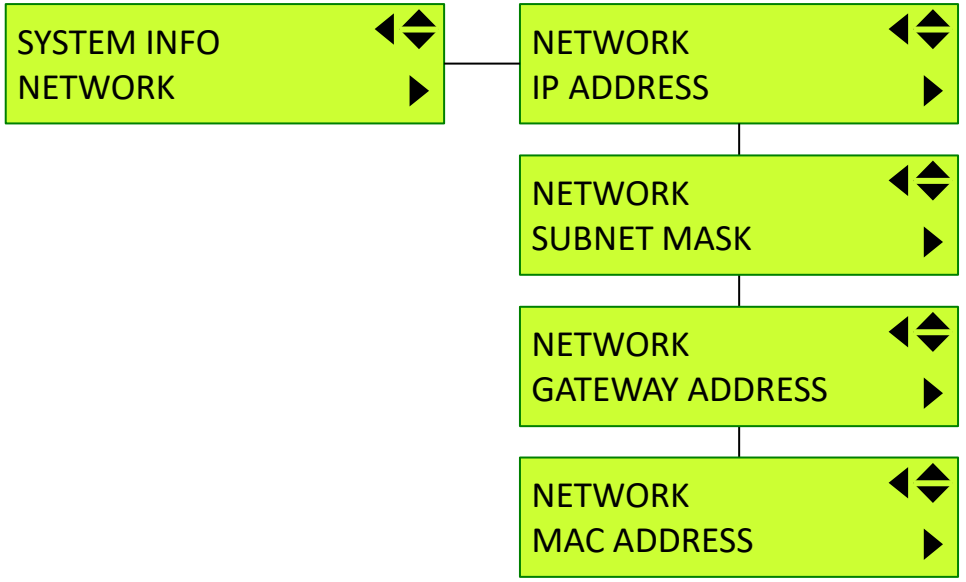
- Menu location of MANUAL CL.







- Ethernet Port
  - Ethernet is only available as interface.
  - IP address can be set on the operation panel.

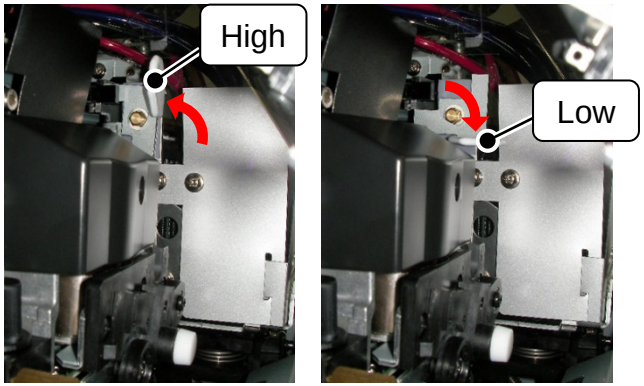


10. Other Features

Head Height

Adjustable between HIGH and LOW*.

*LOW: 1.7mm
*HIGH: 2.7mm



Head Protector

It can avoid the print head surface from being scratched by media jamming.

The surface of the protector is slightly lower than the print head surface.

Operation Panel

The same key layout as VS-series.

Pinch Roller

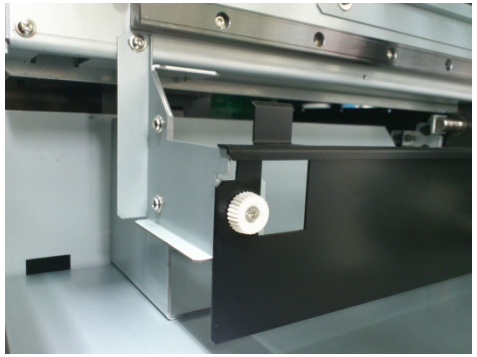
The same pinch roller as VS-series.
Total 8 pinch rollers(VS-640i)
(6 removable middle pinch rollers)

Media Holder

The same as VS-series

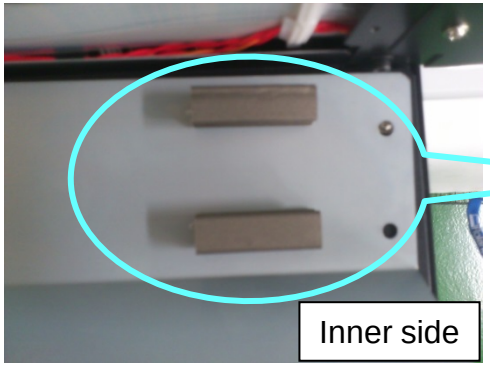
Media flange for 2-inch-core media is not included.
Available as spare parts 21995106 FLANGE.GUIDE 2 PNS-70

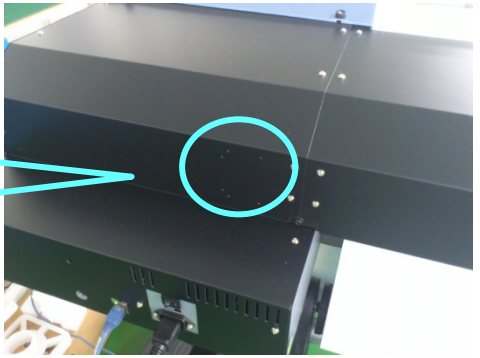
- Sheet cut rail
  - It is attached to the guide rail to improve positioning accuracy of the blade.



- Cartridge holder
  - The same holders as RA/RE, but the these are available as one service parts assembly.

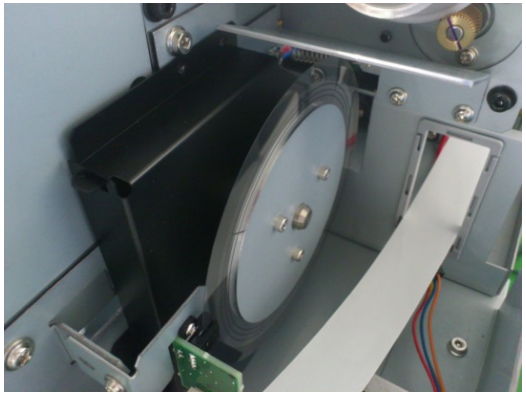
- Countermeasure for electric wave
  - Added to improve the conductivity of the cover and the inner plates.



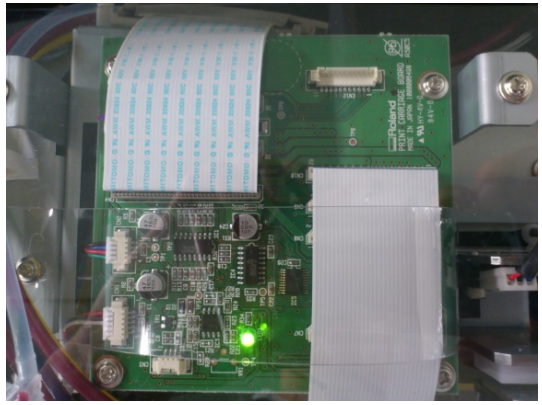


- FEED motor gear cover

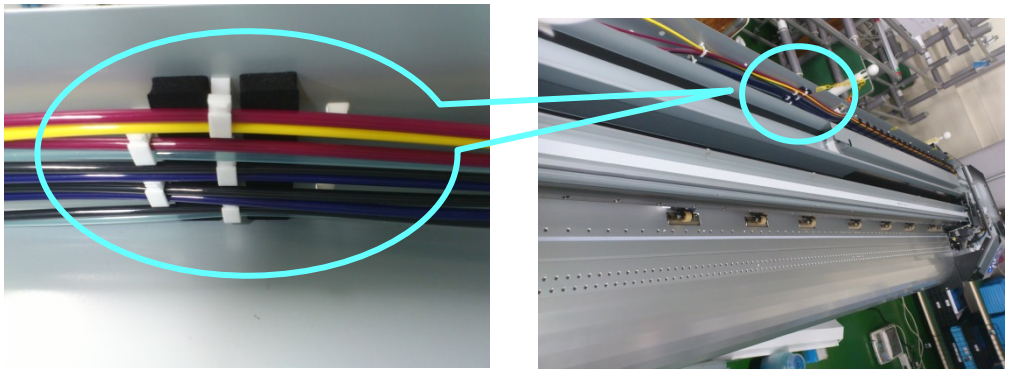
  To prevent the Rotary Encoder from the greasing of the motor attached to it.



- Print carriage board
  - Countermeasure to prevent noise contamination is applied.



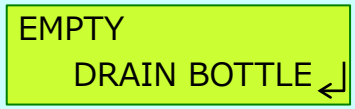
- Tube Holder
  - Holders have been added to prevent the ink tubes from warping forward.



- Initial Ink Filling

  It washes the ink lines using SL-CL cartridges and fills with ink.

  - Initial Ink Filling starts only when turning on the power when no ink is loaded in the printer.
  - 2 cleaning cartridges and 6 dummy cartridges are required.
    (6 dummy cartridges come with the printer.)



!! WARNING !!

Follow this message and be sure to empty the drain bottle.
Otherwise, the draining ink will overflow.

- Initial Ink FILL: clean the whole ink lines and then fill ink.
  - Need 2 SL-CL cartridges.
- FILL INK: fills with ink and perform CHOKE CL.
- HEAD WASH: clean the whole ink lines by using the cleaning liquids.
  - Need 8 ESL4-CL cartridges.
- PUMP UP: pump up all the inks in the ink lines.

	User Menu	Service Menu	Ink pathway	Ink consumption per one(cc)	Waste Amount(cc)	Time
*Initial Ink Fill	Initial Installation	✓	Circulation No circulation	108.94 62.33	623.37	Approx.75min
**FILL INK	✓	✓	Circulation No circulation	108.94 62.33	339.59	Approx.15min
HEAD WASH	✓	✓	Circulation No circulation	199.85 (CL) 77.55 (CL)	1504.81	Approx.90min
PUMP UP	✓	✓	-	0	204.9	Approx.35min

*Initial Ink Fill includes initial cleaning and FILL INK.

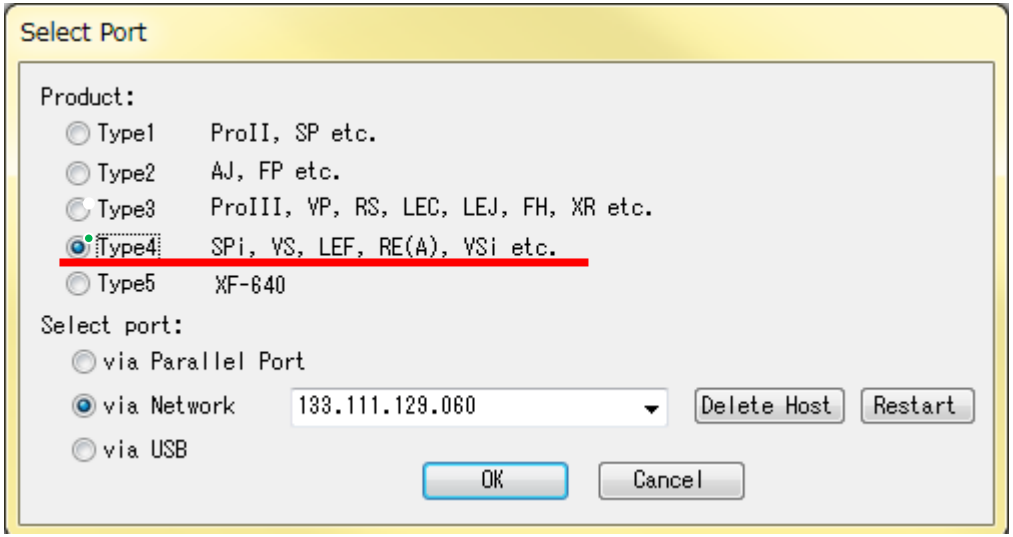
**FILL INK included CHOKE CL after ink filling

12. Software

- Software for End Users
  - Roland VersaWorks Ver.5.00 -
  - Roland OnSupport Ver.1.80 -
    Available via the DG.COM website.
  - VersaWorks 6.00 – **Rev.1.3**
    Available via the DG.COM website.

Roland OnSupport

- Software for Field Engineers
  - Peck version 6.5
    - ◆Choose Type 4



- Transport of the Machine

Two ways are possible.

1. Transport with ink filled	2. Transport with ink removed

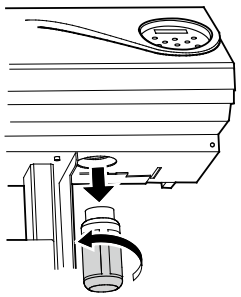
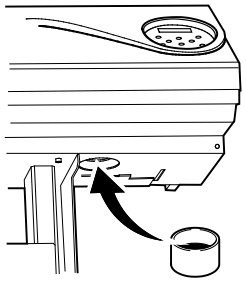
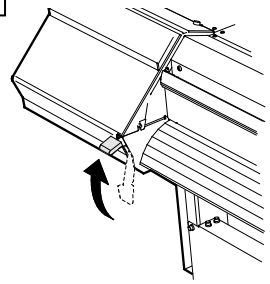
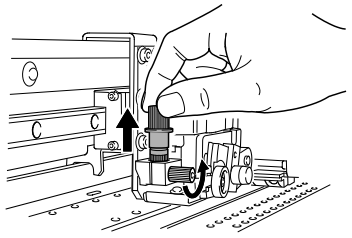
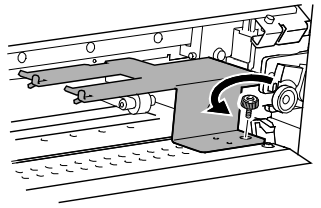
Meet the following conditions to complete each transportation.

1. Transport with ink filled	2. Transport with ink removed
▫ The transport shock is weak. ▫ Temperature does not exceed 40ºC during the transport. ▫ The main power can be turned on in 24 hours.	▫ The machine can be filled with ink again within 1 week after Head Wash is done.

Transport with Ink Filled

MENU	SUB MENU	INK CONTROL
SUB MENU ▶	INK CONTROL ▶	CIRCULATE INK ↵

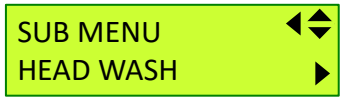
* [CIRCULATE INK] is only for the printer that is in 8-color ink mode.

1	2	3	4	5
				
Remove the drain bottle.	Attach the Bottom plug.	Raise the loading lever.	Detach the blade holder.	Secure the print head in place using the retainer.

- ☑ Do not use dummy cartridges instead of ink cartridges.
- ☑ Do not tilt the machine.
  However, if it is necessary to tilt the machine,
  raise the ink cartridge side up.

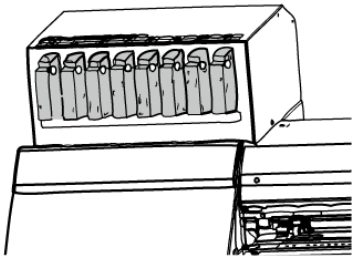
Transport with Ink Removed

1



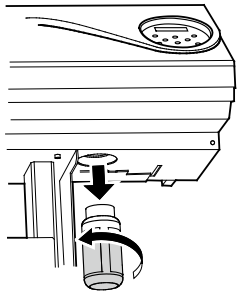
Perform HEAD WASH.
8 pcs of SL-CL are required.

2



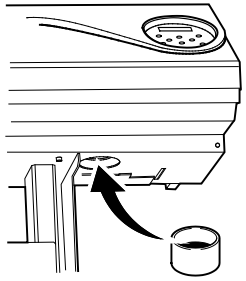
Insert the dummy cartridges.
Extra 2 dummy cartridges are necessary.

3



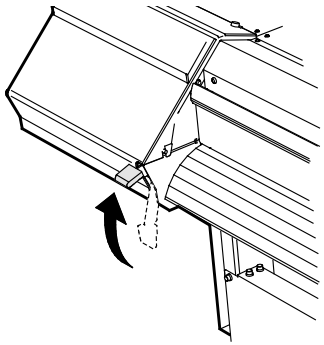
Remove the drain bottle.

4



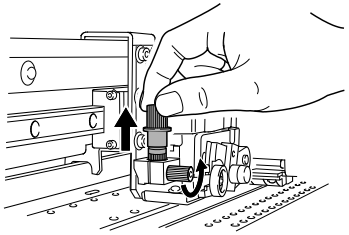
Attach the Bottom plug.

5



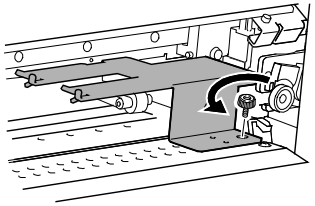
Raise the loading lever.

6



Detach the blade holder.

7



Secure the print head in place using the retainer.

☑ Perform FILL INK within 1 week, otherwise cleaning liquid remained inside the head could cause the printing problems such as missing nozzles or deflected nozzles. In the worst case, the head need to be replaced to solve the problem.

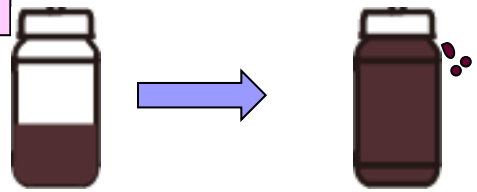
- Change in Waste Ink Operation

  They way to reset the “EMPTY DRAIN BOTTLE” state is changed.

  - Reason for the change

    Since the waste ink count had to be reset manually in the Menu, there tends to be accidents where users forgot to do it and ink spilled out from the bottle.

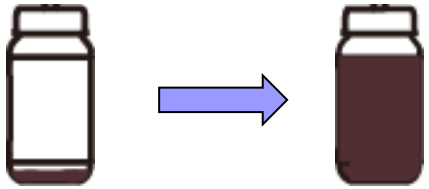
VS Series



If the user resets the count of the waste ink in this state.

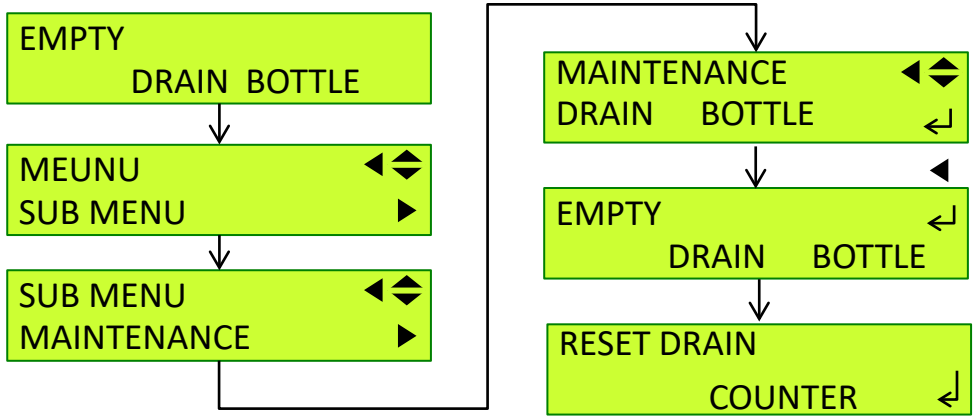
Ink spills over from the bottle

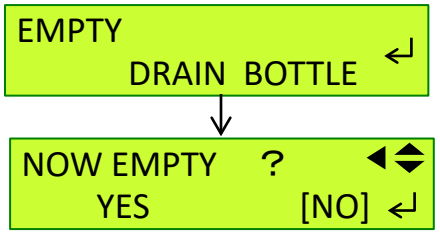
VS-i Series



Waste ink amount can be reset at the time it was emptied

The indication to empty the bottle shows up in the right timing next time.





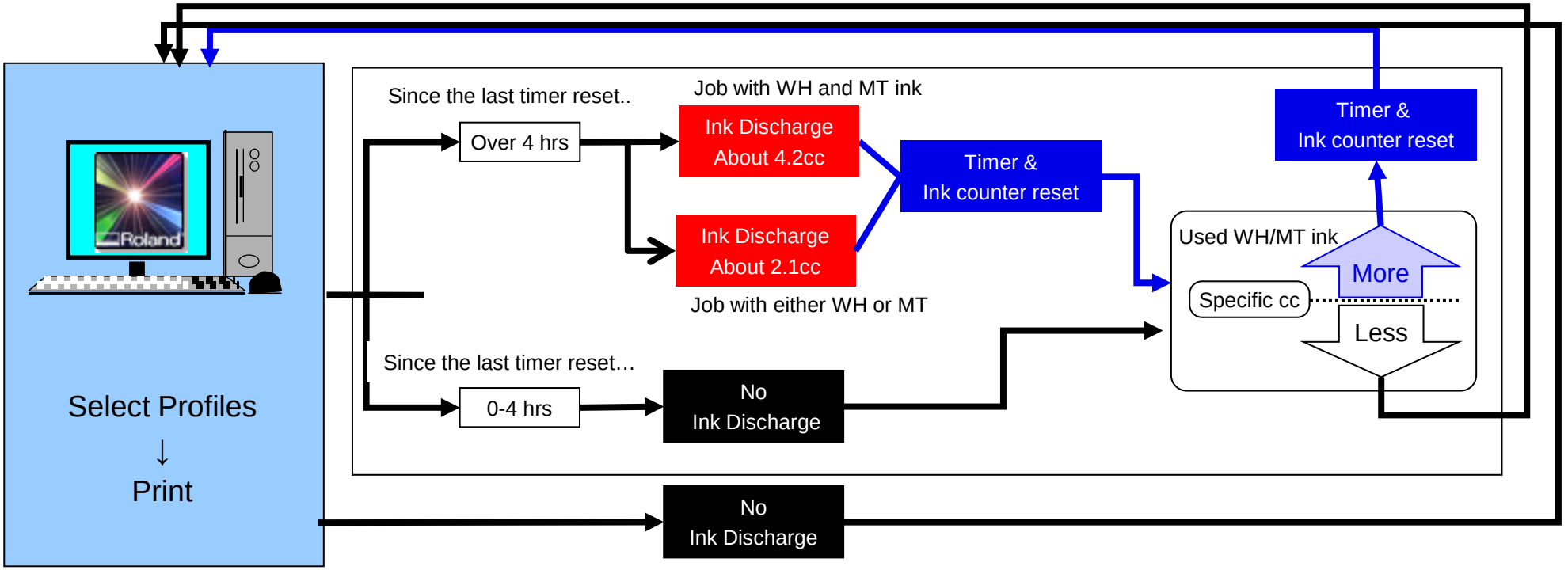
*NO is selected when it shows up

- Ink circulation & Ink Discharge before printing --- (using the WH and MT)---
  - Periodical Ink Circulation

    It just simply circulates the looped ink lines of W and Mt ink. Only the Ink Circulation system runs.
    - For prevention of Wh/Mt ink settlement
    - Condition: Every 6 hours
    - No ink discharge
  - Ink Circulation & Ink Discharge before printing
    - When the machine receives print data that contains Wh/Mt objects, it circulates ink and discharges some amount of ink.
    - When Wh object is contained in the print data, the machine discharges only Wh ink. When Mt object is contained in the print data, the machine discharges only Mt ink.
    - Whether ink discharge takes place or not is determined by the counting of internal timer.
    - Performing time: 180 seconds

Time elapsed after internal timer was last reset	0 – 4 hours	More than 4 hours
Pump operation	Ink Circulation	Ink Circulation & Ink Discharge
When the machine prints the data that contains both Wh and Mt objects	0 cc	Approx. 4.2cc Total of Mt ink and WH

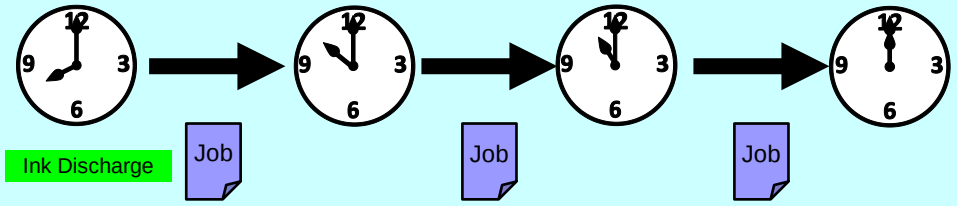
- Operation Map for Ink Discharge Before Printing --- (using the WH and MT)---



Use [CMYKLcLmLk] or [CMYKLcLm] print modes] if the job does not contain any WH or MT objects. Otherwise, the sequence for Ink Discharge is activated to drain WH and MT ink unnecessarily.

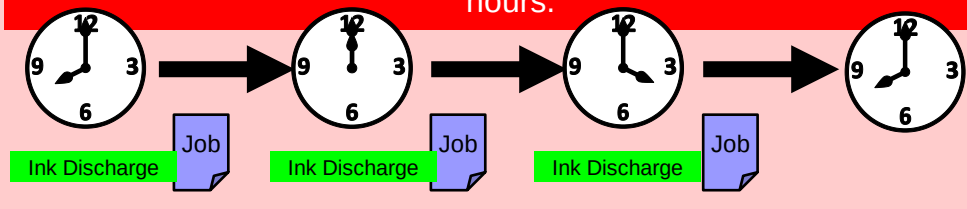
- Ink consumption by Ink Discharge Before Printing --- (using the WH and MT)---

When you perform 3 jobs of WH/MT ink printing within 4 hours.



Ink Discharge x 1 time 4.2 cc (Total of Mt ink and WH)

When you perform each of 3 jobs of WH/MT ink printing every 4 hours.



Ink Discharge x 3 times 12.6 cc (Total of Mt ink and WH)

* Ink Discharge does not run if the specific amount of W and/or Mt ink is used for test printing or job printing.

When you have several Wh/Mt ink jobs, print them all at one time so that the ink consumption for Ink Discharge* can be saved.

Simulation of Ink Consumption for the Automatic Maintenance

4 colors and 7 colors

- CMYKLcLmLkCL

	Print everyday	Not print at all
Consumption per one line	**7.07 cc**	**1.15 cc**
Sum of all cartridges	**56.54 cc**	**9.22 cc**

8 colors

- CMYKLcLmWHMT
- CMYKLcLmLkWH
- CMYKLcLmLkMT

	Print WH/MT job every day	No WH/MT job
Consumption per one line	**WH/MT: 66.1 cc per each Others: 19.9 cc per each**	**19.89 cc per each**
Sum of all cartridges (WH,MT)	**251.52 cc**	**159.12 cc**
Sum of all cartridges (Lk,WH)	**205.32 cc**	**159.12 cc**
Sum of all cartridges (LK,MT)	**205.32 cc**	**159.12 cc**

Simulation of the machine used for one month.

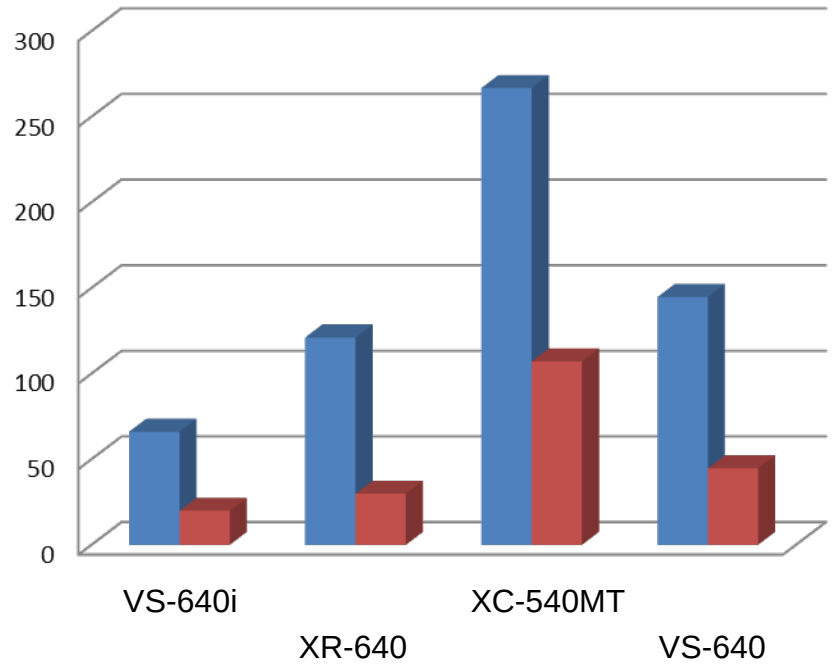
- Working Hour: 8 hours/day
- Working day: Monday to Friday (22days)
- The machine does not get in sleep mode during working hour

* This simulation is a reference. The ink consumption can be changed by usage of the machine.

Ink consumption

Compared to other models

Ink consumption of WH/MT ink by maintenance in a month



Simulation of the machine used for one month.

- Working Hour: 8 hours/day
- Working day: Monday to Friday (22days)
- There are no sleep mode during working hour
- Cleaning times are based on the list in the previous page

The ink consumption of VS-640i is less than that of other models.

* This simulation is a reference. The ink consumption can be changed by usage of the machine.

- Compatibility Chart of the Popular Parts

Part NO,	VS-640/540/420/300	Compatible	Part NO,	VS-640i/540i/300i	Compatible	Part NO,	RE-640
W701406010	ASSY,PANEL BOARD VS-640	⇔	W702406010	ASSY,PANEL BOARD VS-640I	⇔	W701406010	ASSY,PANEL BOARD VS-640
W701406020	ASSY,POWER BOARD VS-640	⇔	W702406020	ASSY,POWER BOARD VS-640I	⇔	W701406020	ASSY,POWER BOARD VS-640
W701406030	ASSY,INK TANK BOARD VS-640	⇔	W702406030	ASSY,INK TANK BOARD VS-640I	⇔	W701406030	ASSY,INK TANK BOARD VS-640
W701406050	ASSY,CROP SENS BOARD VS-640	⇔	W702406050	ASSY,CROP SENS BOARD VS-640I	⇔	W701406050	ASSY,CROP SENS BOARD VS-640
W701406060	ASSY,THERMISTOR BOARD VS-640	⇔	W702406060	ASSY,THERMISTOR BOARD VS-640I	⇔	W701406060	ASSY,THERMISTOR BOARD VS-640
W701406070	ASSY,CARTRIDGE IC BOARD VS-640	⇔	W702406070	ASSY,CARTRIDGE IC BOARD VS-640I	⇔	W701406070	ASSY,CARTRIDGE IC BOARD VS-640
W701407011	ASSY,PRINT CARRIAGE VS-640_01	←	W702407010	ASSY,PRINT CARRIAGE BOARD VS-640I	→	W701987010	ASSY,PRINT CARRIAGE BOARD RE-640
W701407020	ASSY,CUT CARRIAGE BOARD VS-640	n/a	W702407020	ASSY,CUT CARRIAGE BOARD VS-640I	n/a	-	
W701407030	ASSY,LINEAR ENCODER BOARD VS-640	⇔	W702407030	ASSY,LINEAR ENCODER BOARD VS-640I	⇔	W701407030	ASSY,LINEAR ENCODER BOARD VS-640
1000006708	ASSY,SERVO BOARD VS-640	←	1000010546	ASSY,SERVO BOARD VS-640I	→	1000006708	ASSY,SERVO BOARD VS-640
6701979010	ASSY,MAIN BOARD RE-640	←	6702419000	ASSY,MAIN BOARD VS-640I	→	6701979010	ASSY,MAIN BOARD RE-640

- Consumables

Description	Life Expectancy
Print Head	6 billion shots / nozzle *
Rubber Wiper	Wiping count 3,000 times
Felt Wiper	Wiping count 800 times
Wiper Scraper	12 months
Cap Top	6 months
Scan Motor	3,000 hours
Ink Tube	3,000 hours
Sponge under Wipers	Replace when worn out
Battery	24 months
Pinch Roller	Replace when worn out
Cutter Protection	Replace it if there are scratches on it.

* Even if 1 out of 8 nozzle lines reached 6 billion shots, this print head is regarded as the one which has reached the life expectancy.