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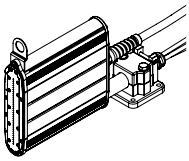
8000+ MINI 32v
8000+ MIDI 32v
8000+ MAXI 32v



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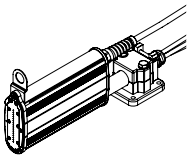
8000+ MIDI 16v
8000+ MAXI 16v



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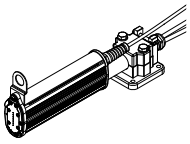
8000+ MAXI 7v



Print Heads 8000+ Range

Technical Manual

Version: 1 Issue: 1

Order number 795 714.01

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Safety & Certification

Matthews Swedot AB and Matthews Marking Products disclaim all responsibility regarding the CE directive if this product is used, altered or installed in any way other than described in this manual.

Please note the following warnings:

- Please read all instructions before using this product for the first time.
- We do not recommend the use of extension cables.
- Cables and tubes must not be subjected to strain or tension.
- Bends in cables should be no less than ten times the diameter of the cable.
- Ensure that this product is not placed anywhere where the cable can be stood on or snagged.
- Do not attempt to open the cover of this product. Internal parts cannot be serviced by the user.
- Never point the nozzle end of a print head at yourself or another person.
- All chemicals, even ink, may present unknown health hazards, and should be treated with caution. Please refer to the Material Safety Data Sheet for further information.
- To avoid ink and cleaner fluid spill, ensure that all tubes (including connections and joints) are mounted so that they can not be damaged or inadvertantly detached.
- Never use sharp or pointed tools when cleaning or replacing the print head.
- Disconnect the power to the printer and call in qualified personnel under the following conditions:
  The power cable or plug is damaged or worn • Liquid has been spilled on the

printer • Rain or water has got into the printer • The printer is not functioning correctly despite the user following the instructions for use • You have dropped this product or the casing has been damaged. • This product is not functioning correctly and requires service.

About this manual

This manual gives technical information which is particular to print heads in the Jet•A•Mark 8000+ range. These are:

- 8000+ MINI 7v • 8000+ MINI 16v • 8000+ MINI 32v
- 8000+ MIDI 7v • 8000+ MIDI 16v • 8000+ MIDI 32v
- 8000+ MAXI 7v • 8000+ MAXI 16v • 8000+ MAXI 32v

This manual does not cover information related to other products, such as how to connect a print head to a specific control unit. For this and more information related to other products, please see the documentation received with those products.

The 8000 MINI 7v IP65, V3 print head is covered in the Special Print Heads documentation. Please contact your dealer for more information.

User information for these print heads is covered in the User Guide received with your print head.

History

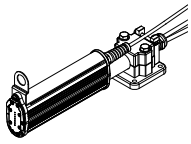
The following table shows which Technical Manual should be used with which print head:

Print Head model	Print Head serial number	Manual version number[a]	Update information
8000+ print heads	32v - 3900 and above 16v - 5250 and above 7v - 1700 and above	V1 I1	First release

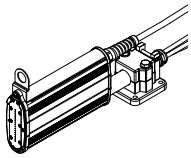
a. Shown on the Contents page.

The 8000+ Range Print Heads

The Jet•A•Mark 8000+ range comprises of the MINI, MIDI and MAXI print head types. Each type has different printing characteristics with respect to print resolution (drop size) where MINI print heads are used for high resolution printing and produce, therefore, small drops, MAXI heads print at a low resolution using large drops and MIDI heads have printing characteristics falling in the middle of the two.



8000+ MINI 7v
8000+ MIDI 7v
8000+ MAXI 7v



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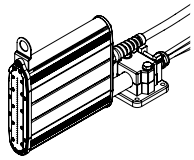
8000+ MIDI 16v
8000+ MAXI 16v

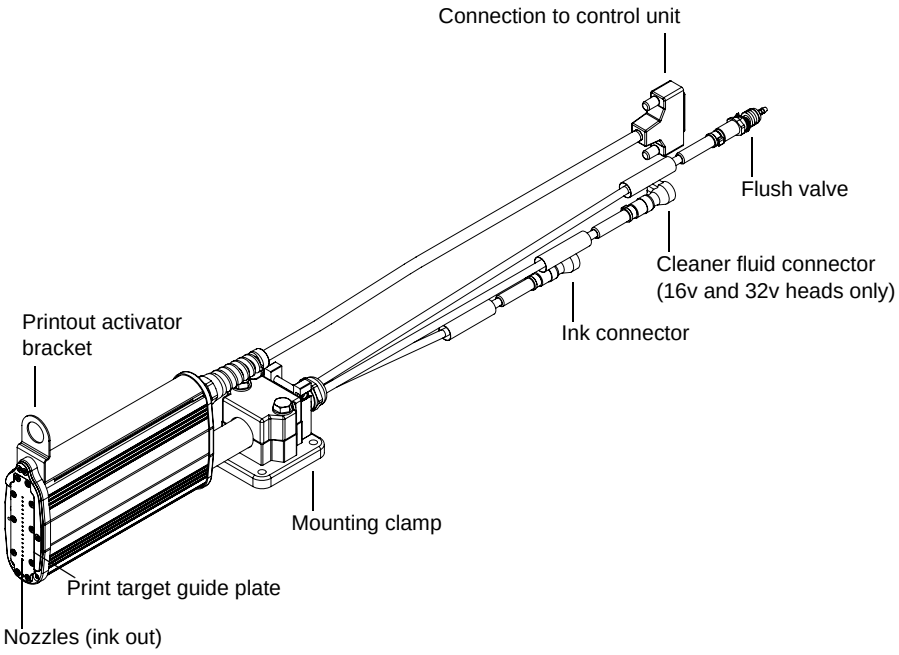


8000+ MINI 32v
8000+ MIDI 32v
8000+ MAXI 32v

Each print head type is available in three models: a 7 valve print head, a 16 valve print head and a 32 valve print head, one for each maximum print height.

See “Print Head Comparison Charts” on page 17 for tables showing the differences between the print heads.

External Parts



Print Head Compatibility

The 8000+ print heads are fully compatible with control units used for 8000 print heads. An 8000+ print head can be used to replace an existing 8000 print head that is in operation. There is no need to make any changes in the control unit and its settings.

Pigmented Inks

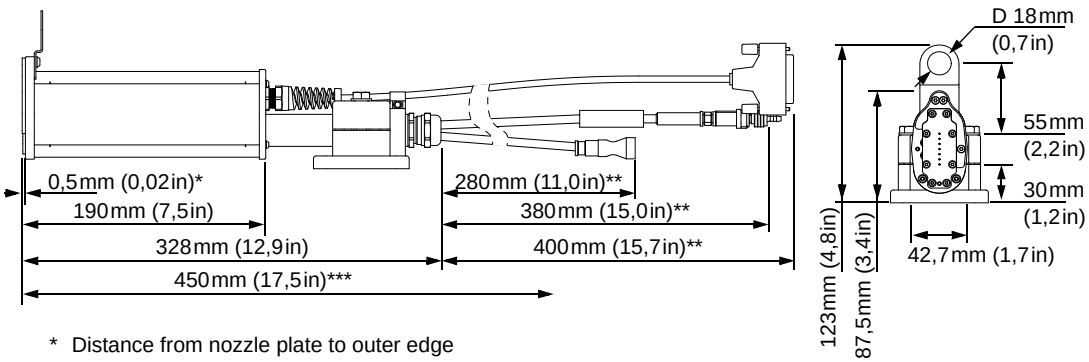
Failure to correctly use pigmented inks, as described below, can cause permanent damage and void the print head's warranty.

All maintenance information contained in this manual is only applicable when using non-pigmented inks.

If an 8000+ print head is to be used with pigmented inks a Matthews CISU (Circulating ink Supply Unit) must also be used. The operation and maintenance information provided in the CISU's Operator manual must be adhered to.

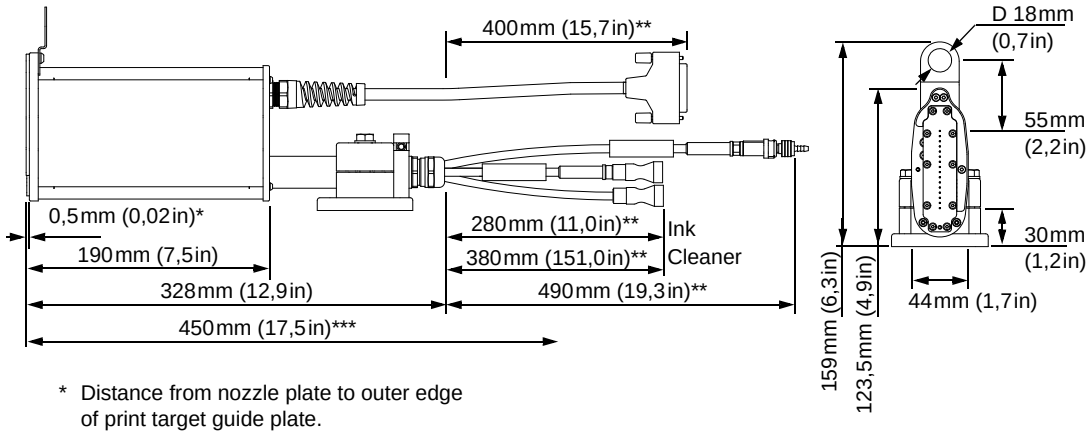
Dimensions

8000+ range, 7v - Approximate weight, excluding clamp: 0,9kg (2lb.)



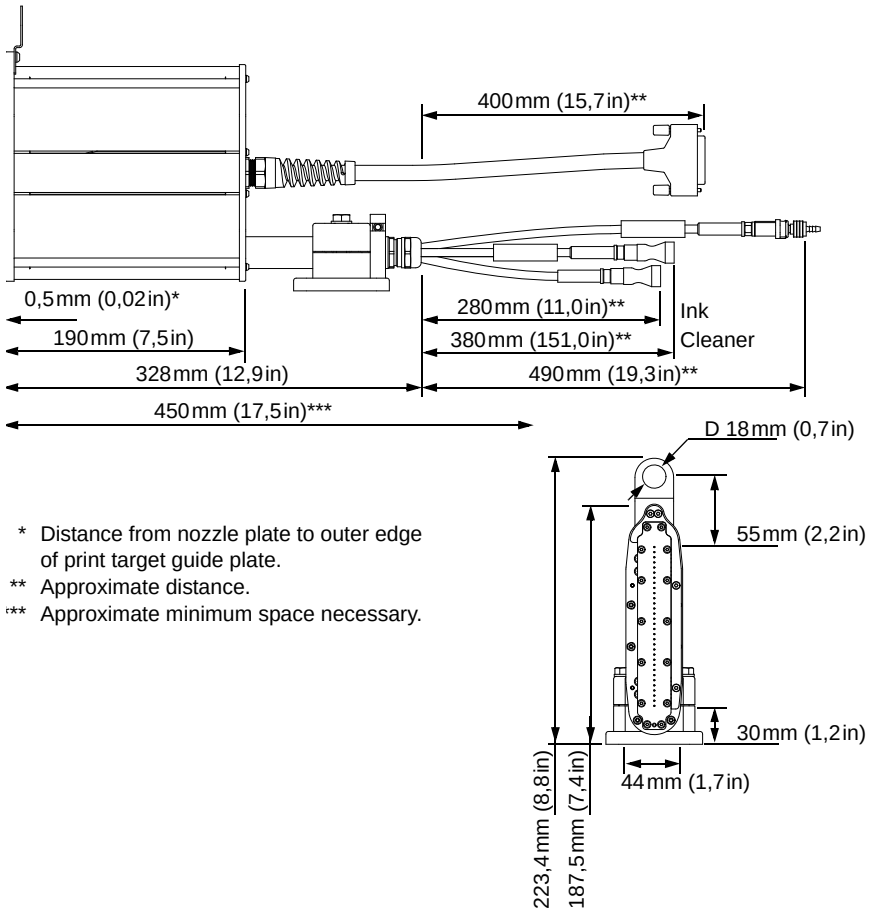
* Distance from nozzle plate to outer edge of print target guide plate.
** Approximate distance.
*** Approximate minimum space necessary.

8000+ range, 16v - Approximate weight, excluding clamp: 1,4kg (3lb.)



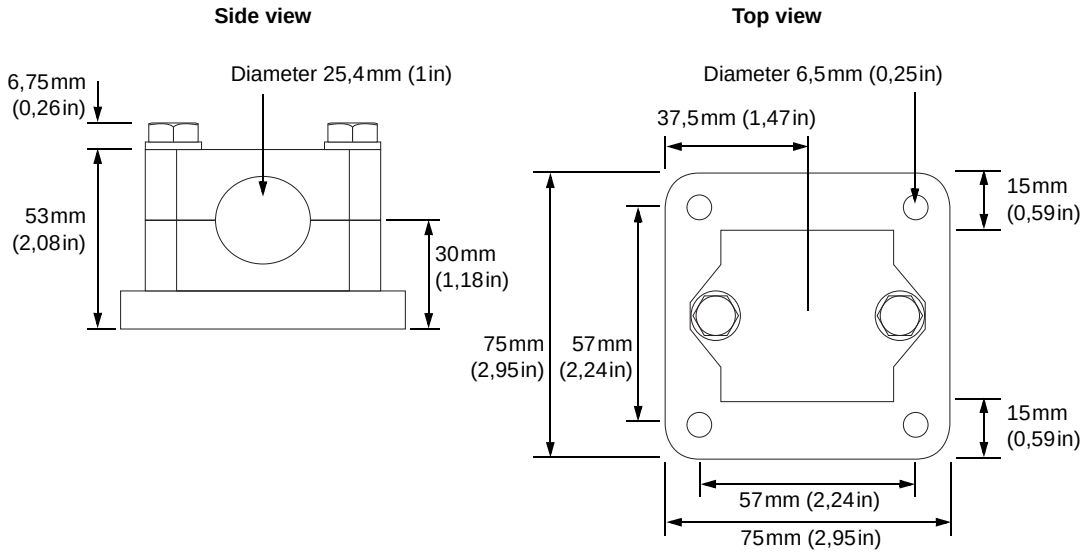
* Distance from nozzle plate to outer edge of print target guide plate.
** Approximate distance.
*** Approximate minimum space necessary.

8000+ range, 32v - Approximate weight, excluding clamp: 2,2kg (4,8lb.)



* Distance from nozzle plate to outer edge of print target guide plate.
** Approximate distance.
*** Approximate minimum space necessary.

Print head mounting clamp



See also “Troubleshooting” on page 18.

Adapting to Print Direction

Each 8000+ range print head is equipped with a print target guide plate which is used to partly prevent the newly printed dots being smudged by the print head itself and partly to flatten uneven surfaces.

Using a size 10 torx driver, mount the guide plate according to the following:

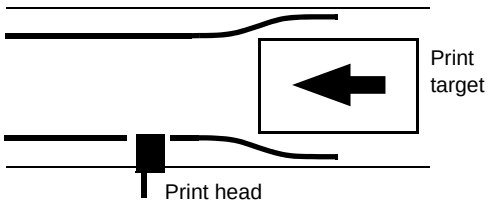
The arrows show the direction in which the print target shall pass in front of the print head.

Positioning

Follow these guidelines when installing 8000+ range print heads.

- Position the print head so that it is as close as possible to the print target during printout. The maximum print distance is 25 mm (1 in)[1].
- The ink supply tube should be made as short as possible and no longer than 15 m (50 ft).
- To avoid ink and cleaner fluid spill, ensure that all tubes (including connections and joints) are mounted so that they can not be damaged or inadvertently detached.
- Please see “Print Head Comparison Charts” on page 17 for the maximum print target speed.
- Make sure that the print head is not positioned so that the print target can knock against it. It may be necessary to mount a guard rail so that the print target cannot change its path.

View from above



1. This distance is dependant on the print speed. The higher the speed the closer the print head needs to be to the print target.

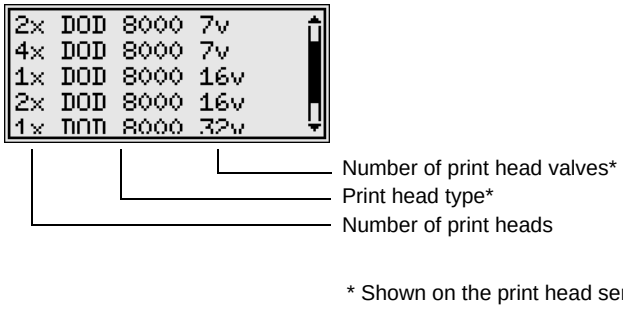
Using with the SX-32 and SX-32e Control Units

Note that the standard Matthews warranty is void if the 8000+ range print heads are used together with any other control units than the following:

DOD•8400/DOD•8400e, SX-32/SX-32e, SX-32i, V84/V84e, or V84i

For more information see the documentation received with the applicable control unit.

At the SX-32(e) control unit, select a print head configuration according to the following. The documentation received with the SX-32(e) control unit, explains how this is done.



* Shown on the print head serial number label

Please see “Print Head Comparison Charts” on page 17 for information on installation settings.

Using with the DOD•8400 and DOD•8400e Control Units

Note that the standard Matthews warranty is void if the 8000+ range print heads are used together with any other control units than the following:

DOD•8400/DOD•8400e, SX-32/SX-32e, SX-32i, V84/V84e, or V84i

Please follow these guidelines when using the 8000+ range print heads. For more information see the documentation received with the control unit.

- Up to four 8000+ range print heads or a maximum of 32 valves can be connected to the control unit to print messages[1].
- The control unit’s driver board settings must be adapted to the total number of nozzles connected, the nozzle grouping (print head nozzles) and the print head type used. In this case the print head type to be selected is:

1. All print heads must have the same Print Direction setting.

For this print head	Select this setting
8000+ MINI 7v	8000Mini.7v
8000+ MINI 16v	8000Mini.16v
8000+ MINI 32v	8000Mini.32v
8000+ MIDI 7v	8000Midi.7v
8000+ MIDI 16v	8000Midi.16v
8000+ MIDI 32v	8000Midi.32v
8000+ MAXI 7v	8000Maxi.7v
8000+ MAXI 16v	8000Maxi.16v
8000+ MAXI 32v	8000Maxi.32v

The Technical Manual, received with the control unit, explains how this is done.

Please see “Print Head Comparison Charts” on page 17 for information on installation settings.

Using with the V84(e) and V84i Control Units

Note that the standard Matthews warranty is void if the 8000+ range print heads are used together with any other control units than the following:

DOD•8400/DOD•8400e, SX-32/SX-32e, SX-32i, V84/V84e, or V84i

- Up to four 8000+ range print heads or a maximum of 32 valves can be connected to the V84(e)/V84i control unit to print messages.

At the control unit, select a print head configuration according to the following. The documentation received with the control unit, explains how this is done.

Number of print heads of each type[a]			
7 Valve	16 Valve	32 Valve	Select this setting[b]
1			7, 7
2			7, 7
2	1		16, 7, 7[c]
4			7, 7, 7, 7
	1		16
	2		16, 16
		1	32

a. Never connect different print head types to the control unit.
b. For the V84(e) only. For further information regarding the V84i refer to the Technical/ Protocol manual.
c. The option 7, 7, 16 can also be selected depending on the set up. Refer to the control unit manual for further information.

Please see “Print Head Comparison Charts” on page 17 for information on installation settings.

Set the Print Direction for each printhead as required. Refer to the control unit’s technical manual for further information.

Reconditioning and In-Service-Rotation of Print Heads

The following recommendations are provided to ensure correct operation of print heads that have been inactive for six months.

Reconditioning a Print Head prior to Installation

If the stamp on the print head package indicates that it was produced more than six months prior to the actual date, it is strongly recommended that the print head is reconditioned before it is put in to operation.

Poor print quality, uneven ink drops during printout, and slight leakage from the nozzles (weapage) can occur if print heads are not correctly prepared, as described below.

Please follow the instructions below if a print head has been inactive for more than six months.

Safety glasses and solvent resistant gloves must be used when contact with ink or solvent liquids is possible. If cleaning solution comes in contact with skin wash it immediately. If contact is made with eyes or mouth, wash them for at least 15 minutes and seek medical advice.

The following procedure sets the printer up to print a message approximately seven times a minute.

1. Connect cleaner fluid, from an ink-supply unit, to the print head’s ink-supply line. See “External Parts” on page 3.
2. Set the ink pressure according to “Print Head Comparison Charts” on page 17 and turn the ink-supply-unit ON.
3. Use the print head’s external flush valve and flush the print head for about 5 seconds.
4. Connect the print head to a control unit.
5. If the print head has an internal three-way-valve set it to *Ink*. Use the control unit to set it to *Ink.*

   Note: The seven valve print heads and the sixteen valve basic do not have an

internal three-way-valve.

6. Create a message consisting of 10 characters. Select a font that will use all of the print head's nozzles.
7. Set the following parameters for the respective control units listed below.

SX-32 control unit

Printer settings	Speed source	Manual
	Target speed	15,0 m/min. (49,2 ft/min.)
	Print height	Maximum
	Spacing/Dot size	Within the recommended range. See "Print Head Comparison Charts" on page 17.
Trigger settings	Trigger mode	External
	Terminate	*Not applicable*
	Skip trigger	0 (zero)
Mark settings	Multiple mark	0 (zero)
	Mark gap	0 (zero)
	Mark length	2000 mm (78,7 inches)

DOD•8400 and DOD•8400e control units

Config/Limit	Terminate	*Not applicable*
	Mark gap	2000 mm (78,7 inches)
	Max mark	Off
	Max trig	Off
Install/Manual	Encoder	None
	Speed	15,0 m/min. (49,2 ft/min.)
	Trigger	External
	Distance	0
	Height	100%
Message settings	Spacing/Dot size	Within the recommended range. See "Print Head Comparison Charts" on page 17.

8. Place an object in front of the photocell (printout activator) so that printout is continuously activated.
9. Start printing and allow the print head to run for an hour. Once complete the print head will be ready for delivery/installation.

In-Service-Rotation of Spare Print Heads

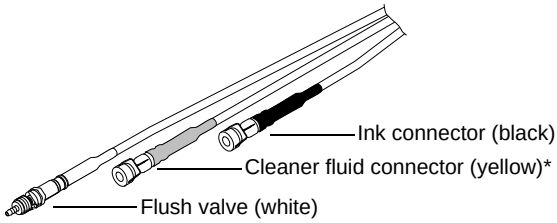
In installations where spare print heads are kept in stock, the spare heads should be rotated in-service, every six months. This will ensure correct operation of the print heads when put in service.

If spare print heads are rotated every six months, there will be no need to recondition them, as described above. The spare heads will simply require flushing with cleaner and ink before use, as described under “Starting Up” on page 14.

Before removing a print head from service its ink lines and nozzles must be flushed with cleaner.

Connecting to an Ink Supply Unit

Safety glasses and solvent resistant gloves must be used when contact with ink or solvent liquids is possible. If cleaning solution comes in contact with skin wash it immediately. If contact is made with eyes or mouth, wash them for at least 15 minutes and seek medical advice.



*The 8000+ range, 7v head does not have a cleaner fluid connector

Note that the standard Matthews Swedot warranty is void if the 8000+ range print heads are used together with any other than Jet-A-Mark ink supply units.

For procedures relating to a specific ink supply unit, please see the documentation received with your unit.

General Information

- Use the Matthews 2x1 litre HP ink supply system or FPS (Basic or Advanced) for ink delivery.
- All 8000+ range print heads are run in with the ink type specified by the customer. Damage will occur and the warranty will be void if the head is used with any other ink type. Please contact your dealer if you wish to change ink types.
- When flushing and cleaning, use only cleaner fluid which is suited to the ink type being used.
- Please see “Print Head Comparison Charts” on page 17 for information on the nominal ink pressure range for the applicable print head.
- Do not use pressurised (factory) air.

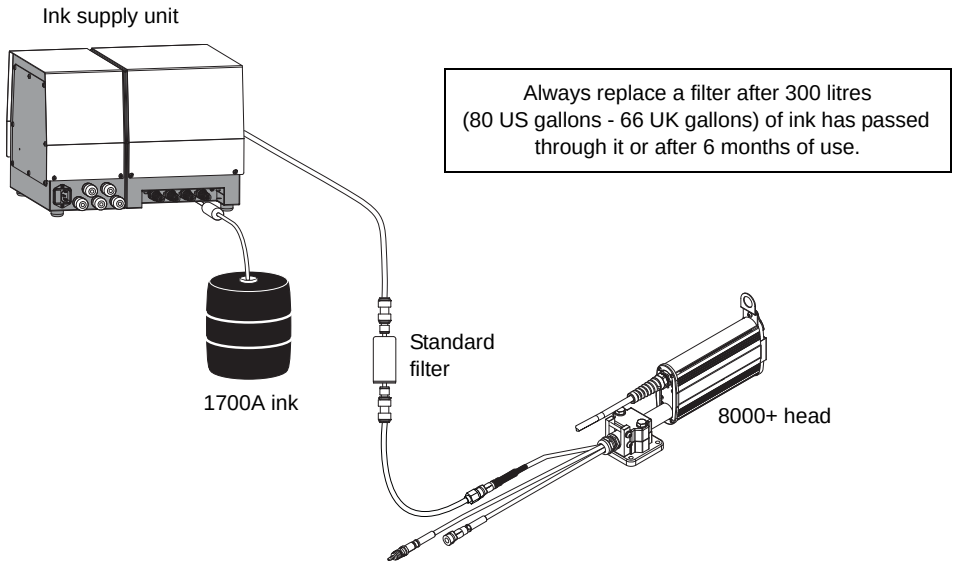
Ink Tube Recommendations

The choice of tubing, between the print head and ink supply unit, is dependant on the type of installation according to the following:

Type of installation	Choice of tubing	Diameter: mm (inches)
Normal printing frequency and ink usage.	Standard	Internal: 3,2 mm (0,125 in) External: 6,4 mm (0,25 in)
More than one print head connected to a single ink supply unit. Continuous or barcode printing.	High capacity	Internal: 6,4 mm (0,25 in) External: 9,5 mm (0,375 in)

Ink Filtering Recommendations

Under normal printing situations the ink supply unit will take care of any ink filtering needs and extra filtration is therefore not necessary. An exception is when 1700A ink is being used. This ink requires that a standard (CS marked) filter is used between the ink supply unit and the print head. Please contact your dealer to order the filter.



For information relating to the ink supply unit, please see the documentation received with your unit.

Starting Up

Safety glasses and solvent resistant gloves must be used when contact with ink or solvent liquids is possible. If cleaning solution comes in contact with skin wash it immediately. If contact is made with eyes or mouth, wash them for at least 15 minutes and seek medical advice.

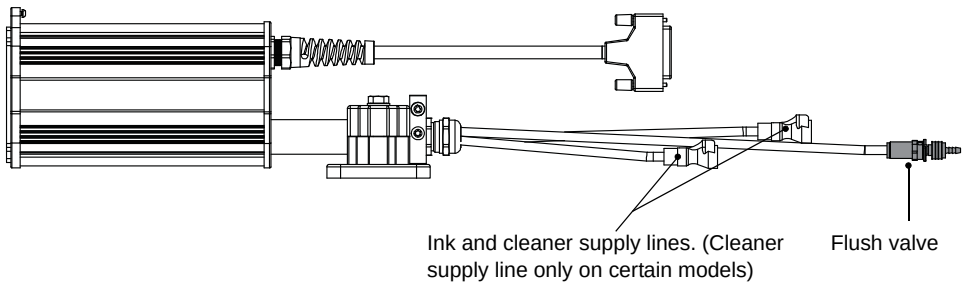
The 8000+ print heads must be correctly prepared as described below before using them for the first time. Failure to correctly prepare a print head can lead to permanent damage and void its warranty.

1. Connect the print head to a control unit.
2. Get a bottle of ink and a bottle of cleaner.
3. Get an ink-supply-unit and mount both the ink bottle and the cleaner bottle in to it.

   If the print head has a cleaner supply line continue from Step 4, otherwise continue from Step 5.
4. Connect the cleaner supply, from the ink-supply-unit, to the print head's cleaner-supply-line. The supply lines to the print head are clearly labelled: *Cleaner* and *Ink* respectively.

   4.1. Use the control unit to switch the print head's internal three-way-valve to *Cleaner*. Refer to the control unit's manual as necessary.

   4.2. Turn the ink-supply-unit ON and flush the print head with approximately 0,1 Litre of cleaner. Use the print head's two way flush valve, as shown, to flush the head.



   4.3. Use the control unit and set the print head's internal three-way-valve to *Ink*.
5. Connect the cleaner supply, from the ink-supply-unit, to the print head's ink-supply-line.
6. Turn the ink-supply-unit ON and use the print head's flush valve to flush the print head with approximately 0,2 Litre of cleaner fluid.

7. Connect the ink supply, from the ink-supply-unit, to the print head's ink-supply-line.
8. Flush the print head using its flush valve. Stop when ink can be seen exiting the flush valve.
9. Use the flush function in the control unit and flush the print head's nozzles with ink. Place a piece of cardboard in front of the nozzles while they are flushing, to catch the ejected ink. Refer to the control unit's manual for further information regarding the use of the flush function, if required.

The print head is now ready for operation.

Security Notices

- **Warning** - Refer to the appropriate “Material Safety Data Sheets” for information on the fluids used with your Jet-A-Mark product. These documents state whether or not the fluid is flammable and what action to take if the fluid comes into contact with eyes or skin.
- **Warning** - Ink under pressure. Use protective goggles and rubber gloves when handling ink.
- **Caution** - Use only the correct Matthews inks and cleaners. Failure to do so will damage the unit and void the warranty.
- **Caution** - Running the print head/s without fluid will cause damage. Therefore, check regularly for kinks or other stoppages in the lines.
- **Caution** - To avoid ink and cleaner fluid spill, ensure that all tubes (including connections and joints) are mounted so that they can not be damaged or inadvertently detached.

Print Head Comparison Charts

This following chart shows comparisons between 7, 16 and 32 valve print heads.

	8000+ MINI, MIDI & MAXI Print Heads			
	7 valve	16 valve Basic	16 valve	32 valve
3-way valve[a]	No	No	Yes	Yes
Cleaner fluid connection	No	Yes	Yes	Yes
Control unit connection	25 pole male D-sub	25 pole male D-sub	25 pole male D-sub	50 pole male D-sub
Number of printout lines	1	1 to 2	1 to 2	1 to 5
Maximum printout height	5 to 28mm (0,2 to 1,1in)	5 to 64mm (0,2 to 2,5in)	5 to 64mm (0,2 to 2,5in)	5 to 128mm (0,2 to 5,0in)

a. For remote switching between ink and cleaner fluid.

MINI, MIDI & MAXI Print Heads

This chart shows a comparison between the MINI, MIDI and MAXI print heads.

	8000+ 7, 16 & 32 Valve Print Heads		
	MINI	MIDI	MAXI
For use with control unit:			
DOD•8400	No	No	Yes
DOD•8400 CPU Module (R44)	No	No	Yes
DOD•8400e	Yes	Yes	Yes
DOD•8400e CPU Module (R44e)	Yes	Yes	Yes
SX-32(e)	Yes	Yes	Yes
V84(e)	Yes	Yes	Yes
V84i	Yes	Yes	Yes
For use with ink type:			
SCP	Yes	Yes	Yes
SCP pigmented	No	Yes	Yes
DPI	No	No	Yes
DPI pigmented	No	No	Yes
Max' print target speed - m/min (ft/min)	90 (295)	90 (295)	240 (787)
Max' character height mm (in.):			
5x5 font	2,5 (0,1)	3,5 (1,2)	9,0 (0,4)
32x10 font[a]	30 (1,2)	40 (1,6)	64 (2,5)
Recommended dot size range - microseconds	200 - 500	220 - 1000	350 - 2000
Minimum dot spacing / tilt setting - mm (in.)			
All settings	0,56 (0,02)	0,56 (0,02)	
100 - 50%			1,5 (0,06)
Nominal ink pressure range - bar (PSI)	0,5 - 1,0 (7,3 - 14,5)	0,5 - 1,0 (7,3 - 14,5)	0,3 - 1,0 (4,4 - 14,5)

a. These are the maximum settings which will give a solid (compact) printout.

Troubleshooting

If this troubleshooting guide does not help in solving your problem, please contact your dealer for assistance.

See www.matthewsmarking.com to find a distributor in your country.

Fault	Possible cause	Remedy
No printout and no clicking sound heard from head during printout.	No message selected for printout.	Select a message at the control unit.
	Selected message empty.	Check message contents at the control unit.
	Control unit not switched on	Switch control unit on.
	Print head cable not connected.	Connect cable.
	Print head connected incorrectly	Check connections
	Incorrect print head settings at control unit	See “Using with the DOD•8400 and DOD•8400e Control Units” on page 8 or “Using with the SX-32 and SX-32e Control Units” on page 8.
No printout or poor printout quality but clicking sound heard from head during printout.	Ink tube not connected.	Connect ink tube.
	Print distance too much.	Move print head closer to print target.
	Low ink pressure.	Check ink pressure at ink supply unit.
	Low dot size setting.	Check printer (message) settings at the control unit.
	Ink tube blocked.	Unblock ink tube. See also “Ink Tube Recommendations” on page 13.
	Ink filter blocked.	If applicable, replace the ink filter between the ink supply unit and print head. Ensure that the replacement filter is marked with the letters ‘CS’. See also the ink supply unit manual.
	Print head nozzle blocked	Brush nozzle with cleaner fluid.
		Flush head with cleaner fluid.

(Sheet 1 of 2)

Fault	Possible cause	Remedy
	Too long since last print-out.	Print more often (perhaps between print targets) or print more dots at each printout. See also “Ink Tube Recommendations” on page 13.

(Sheet 2 of 2)

User Notes

Print head	Serial number	Ink type	Cleaner type	Pressure
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