ABB MEASUREMENT & ANALYTICS | INFORMATION | INF13/145-EN REV. A

Navigator 550

Sodium and hydrazine wet-sections

Tubing replacement procedures (single-stream and multi-stream)

Measurement made easy

Navigator 500 sodium and hydrazine wet-sections

1 Introduction

These procedures must be carried out by a trained technician only.

Tools required

- Blade suitable for cutting PVC tubing

2 For more information

Further information is available from:
www.abb.com/analytical

or by scanning these codes:

Sales

Service

3 Safety

Warning.

These procedures must be carried out by a trained technician.

CHEMICAL 

- Ensure personal protective equipment (PPE) such as **gloves** and **eye protection** are worn during any maintenance.
- Observe all health and safety procedures for handling chemicals.
- To familiarize yourself with handling precautions, dangers and emergency procedures, always review the Material Safety Data Sheets prior to handling containers, reservoirs and delivery systems that contain chemical reagents and standards.
- Take care if cleaning any spillages and observe all relevant safety instructions. Wipe up any spillages using clean water.
- Perform general cleaning of the wet-section using a damp cloth only – mild detergent can be used as a cleaning aid. Do not use Acetone or any organic solvents.

ELECTRICAL

- Isolate all high voltage supplies to the transmitter before replacement of tubing.
- The wet-section is vulnerable to electrostatic damage. Wear an anti-static strap or dismantle the wet-section on an anti-static workbench.
- Ensure all electrical connections are kept dry at all times.

GENERAL

- Shut off the external sample supply to the wet-section and ensure the wet-section is drained down fully before performing replacement procedures.
- When the replacement procedure is complete, restore power to the transmitter and sample to the wet-section at the correct flow rate and calibrate the wet-section – refer to the wet-section Operating instructions (sodium OI/ASO550-EN or hydrazine OI/AHM550-EN) for calibration instructions.
- Dispose of the old components in accordance with the guidelines contained in the Operating instructions (sodium OI/ASO550-EN or hydrazine OI/AHM550-EN).

4 Items required

4.1 Hydrazine wet-section

- 1 x tubing kit (part number AW503 062) – required for 12-monthly maintenance (includes tubing supplied in AW503 063 below)
- 1 x tubing kit (part number AW503 063) – calibration and reagent solution tubing (only) kit

4.2 Sodium wet-section (single-stream and multi-stream)

- 1 x tubing kit (part number AW501 075) – required for 12-monthly maintenance (includes tubing supplied in AW501 076 below)
- 1 x tubing kit (part number AW501 076) – calibration and reagent solution tubing (only) kit

5 Tubing replacement procedures

5.1 Sodium single-stream wet-section

Referring to Fig. 5.1, page 4:

1. Disconnect the reagent tube (A) from the entrainment T-piece, remove the reagent bottle and move it to a safe place – preferably a fume cupboard.

   Remove connector from elbow on the top of the bottle and fit new tube.
2. Disconnect the QD connectors to bottles on tubes (B), (C) and (D) and disconnect tubes (B), (C) and (D) from their respective QD connectors (take care when disconnecting the reagent tubing as reagent solution is present in the tubing).
3. Disconnect all other tubing, taking each tube in turn, and replace with the new tubing; cut to length as necessary – refer to Table 5.1, page 4.
4. Once all tubes have been replaced, reconnect the QD connectors as required and finally reconnect the sodium reagent bottle assembly, complete with tubing slotted down through left hand rear channel in maincase moulding and connect to entrainment piece.
5. Ensure all tubing is connected and routed correctly, especially drain tubes.
6. Restart analyzer – open sample inlet feed and establish correct flowrate.

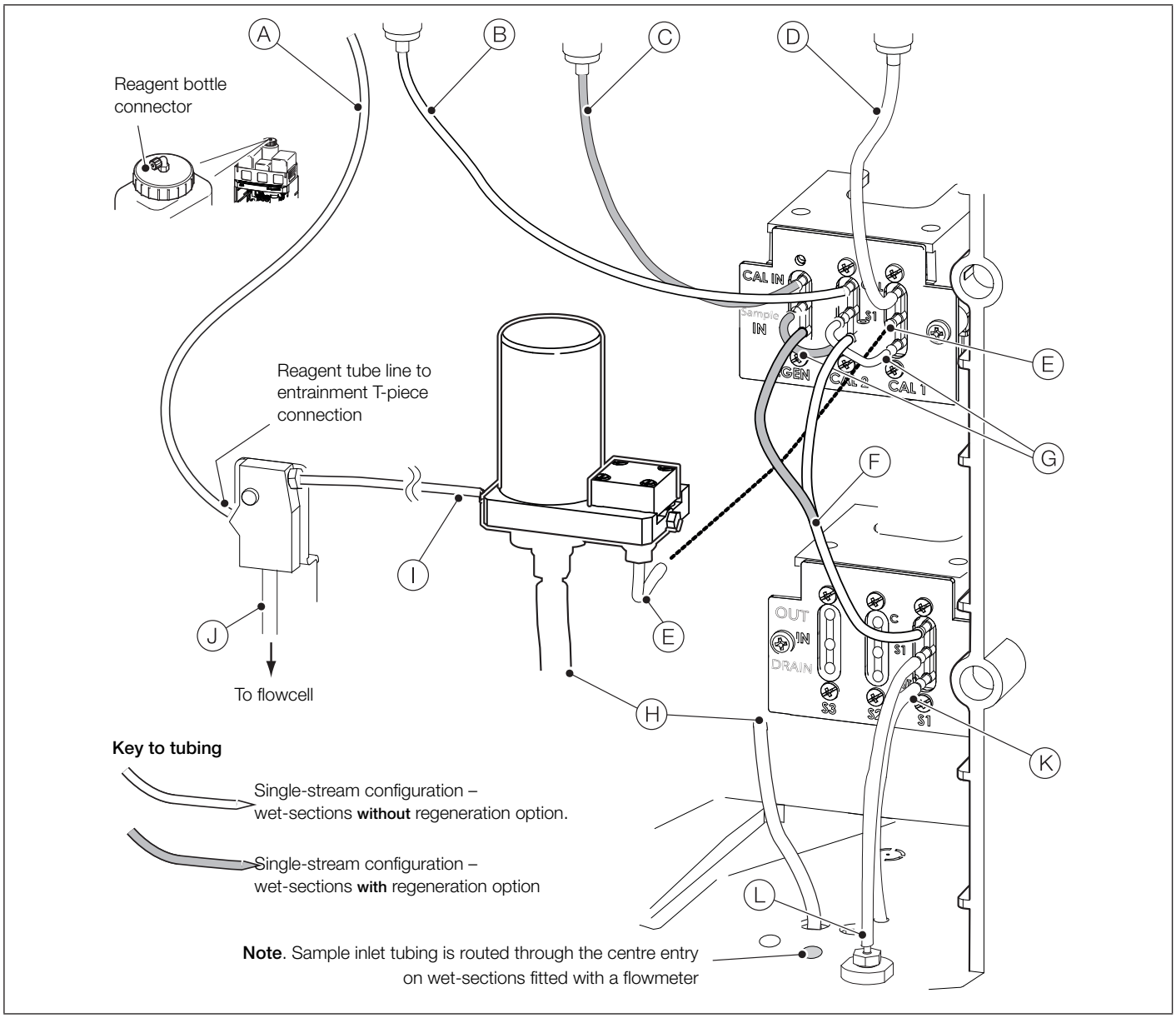


Fig. 5.1 Tubing replacement – sodium single-stream wet-section

Item	Description	Length mm (in.)	Part number	Quantity
Ⓐ	Reagent tubing	550 (21.6)	0212397 $^{3}/_{32}$ in. ID x $^{5}/_{32}$ in. OD	1
Ⓑ	Calibration solution 2 tubing	250 (10)	0212214* $^{1}/_{16}$ in. ID x $^{1}/_{8}$ in. OD	1*
Ⓒ	Regeneration solution tubing (if fitted)	250 (10)		1*
Ⓓ	Calibration solution 1 tubing	250 (10)		1*
Ⓔ	Constant-head to calibration + regeneration valve assembly	50 (2)	0212362* $^{3}/_{32}$ in. ID x $^{5}/_{32}$ in. OD Tygon	1
Ⓕ	Calibration + regeneration valve assembly to switching valve assembly – same tubing used for optional regeneration / non-regeneration wet-sections	145 (5.7)		1*
Ⓖ	Regeneration / Calibration 2 / Calibration 1 jumper tubing	50 (2)		2*
Ⓗ	Sample outlet tubing (drain)	280 (11)	0212189 $^{1}/_{4}$ in. ID x $^{3}/_{8}$ in. OD	1
Ⓘ	Constant-head to entrainment 'T' piece tubing	100 (4)	0212206 1 mm ID x 1 mm wall	1
Ⓙ	Entrainment 'T' piece to flowcell chamber tubing	10 (0.4)	0212310	1
Ⓚ	Drain tubing – same length for wet-sections with / without flowmeters	145 (5.7)	0212362* $^{3}/_{32}$ in. ID x $^{5}/_{32}$ in. OD Tygon	1*
Ⓛ	Inlet tubing – same length for single-stream wet-sections with / without flowmeters	145 (5.7)		1*

Table 5.1 Schedule of replacement plastic tubing – single-stream sodium

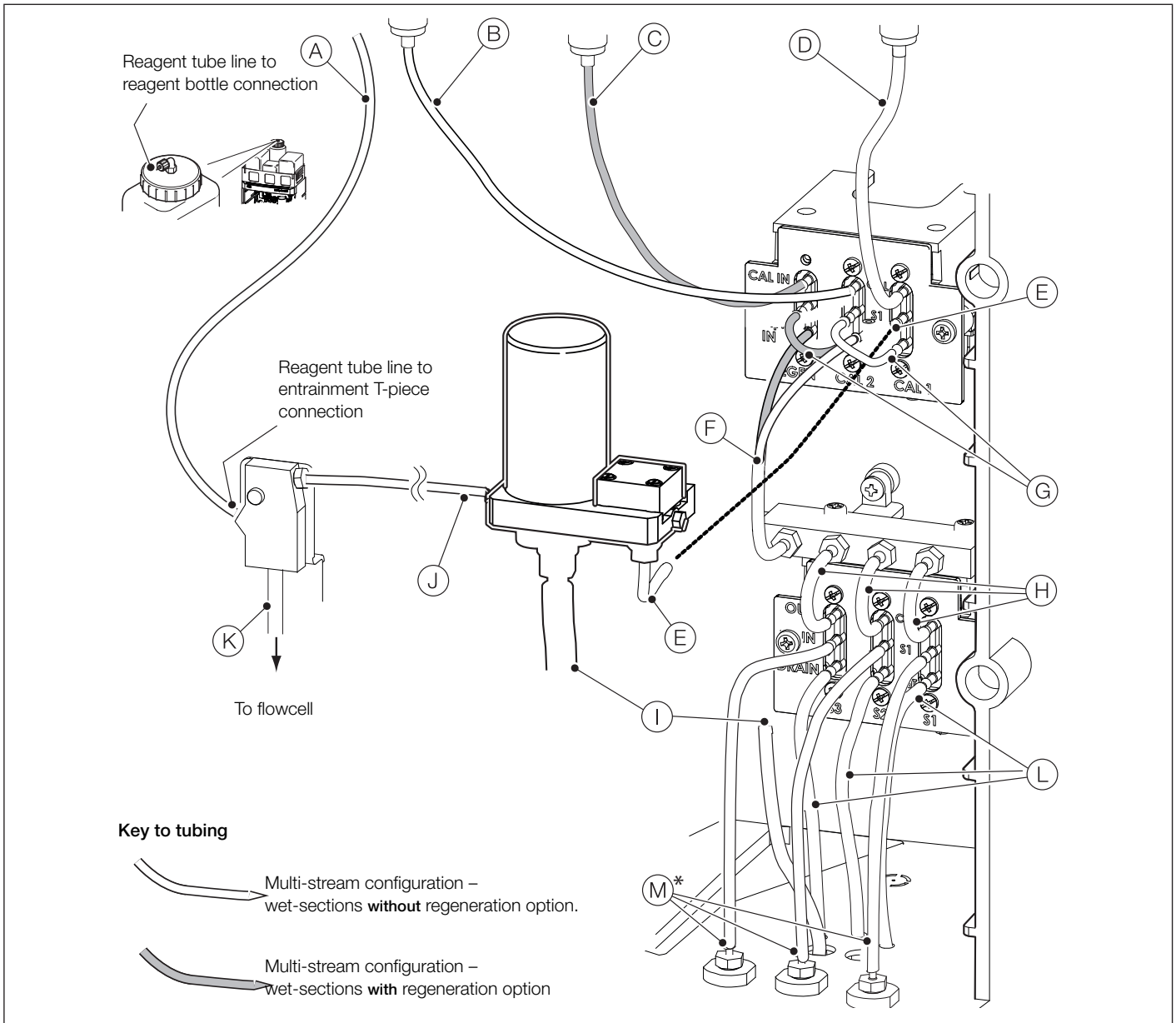
*Tubing must be cut to correct length.

5.2 Sodium multi-stream wet-section

Referring to Fig. 5.2:

1. Disconnect the reagent tube (A) from the entrainment T-piece, remove the reagent bottle and move it to a safe place – preferably a fume cupboard.

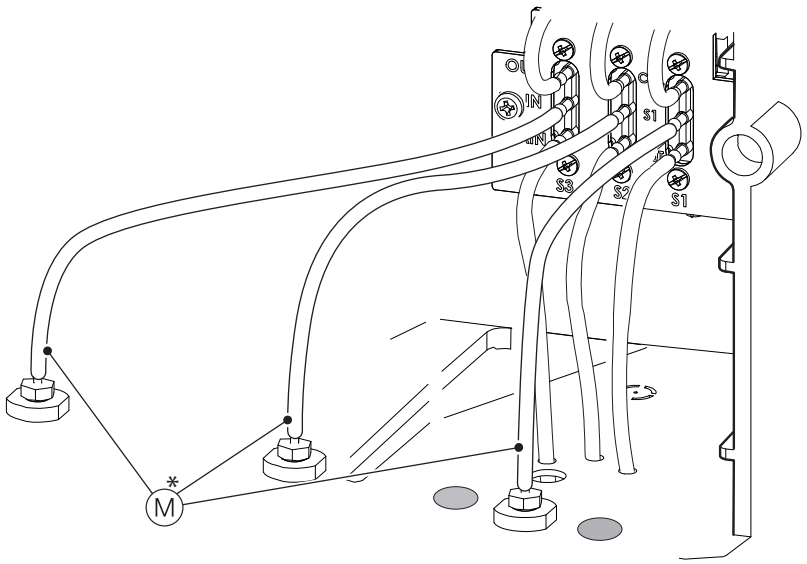
   Remove connector from elbow on the top of the bottle and fit new tube.
2. Disconnect tubes (B), (C) and (D) from their respective QD connectors (take care when disconnecting the reagent tubing as reagent solution is present in the tubing).
3. Disconnect all other tubing, taking each tube in turn, and replace with the new tubing; cut to length as necessary – refer to Table 5.2, page 6.
4. Once all tubes have been replaced, reconnect the QD connectors as required and finally reconnect the sodium reagent bottle assembly, complete with tubing slotted down through left hand rear channel in maincase moulding and connect to entrainment piece.
5. Ensure all tubing is connected and routed correctly, especially drain tubes.
6. Restart analyzer – open sample inlet feed and establish correct flowrate.



*For inlet tube routing on wet-sections **with** flowmeters, refer to item Fig. 5.3, page 6, item (M).

**Tubes (B), (C) and (D) use QD couplings at the solution bottles, all other tubing connections are to barbed connectors.

*Fig. 5.2 Tubing replacement – sodium multi-stream wet-section **without** flowmeters*



*For inlet tube routing on wet-sections **without** flowmeters, refer to Fig. 5.2, page 5, item (M).

*Fig. 5.3 Tubing replacement – sodium multi-stream wet-section **with** flowmeters (inlet tubing only)*

Item	Description	Length mm (in.)	Part number and size	Quantity
(A)	Reagent tubing	550 (21.6)	0212397 3/32 in. ID x 5/32 in. OD	1
(B)	Calibration solution 2 tubing	250 (10)	0212214* 1/16 in. ID x 1/8 in. OD	1*
(C)	Regeneration solution tubing (if fitted)	250 (10)		1*
(D)	Calibration solution 1 tubing	250 (10)		1*
(E)	Constant-head to calibration + regeneration valve assembly	50 (2)	0212362* 3/32 in. ID x 5/32 in. OD Tygon	1*
(F)	Calibration + regeneration valve assembly to manifold valve assembly (same tubing used for optional regeneration / non-regeneration wet-sections)	145 (5.7)		1*
(G)	Regeneration / Calibration 2 / Calibration 1 jumper tubing	50 (2)		2*
(H)	Switching valve to manifold valve	50 (2)		3*
(I)	Sample outlet tubing (drain)	280 (11)	0212189 1/4 in. ID x 3/8 in. OD	1
(J)	Constant-head to entrainment 'T' piece tubing	100 (4)	0212206 1 mm ID x 1 mm wall	1
(K)	Entrainment 'T' piece to flowcell chamber tubing	10 (0.4)	0212310	1
(L)	Drain tubing – same length for wet-sections with / without flowmeters	145 (5.7)	0212362* 3/32 in. ID x 5/32 in. OD Tygon	1* per stream
(M)	Inlet tubing, streams 1 to 3 – wet-section **without** flowmeters (see Fig. 5.2, page 5, item (M))	145 (5.7)		1* per inlet
	Inlet tubing – wet-section **with** flowmeters (see Fig. 5.3 above): Stream 1 Stream 2 Stream 3	 145 (5.7) 190 (7.5) 245 (9.6)		 1* 1* 1*

Table 5.2 Schedule of replacement of plastic tubing – multi-stream sodium (3-stream)

*Tubing must be cut to correct length.

5.3 Hydrazine wet-section

Referring to Fig. 5.4:

1. Disconnect the QD connectors from the bottle QD connectors.
2. Disconnect the calibration and reagent tubes from their respective QD connectors (take care when disconnecting the reagent tubing as reagent solution is present in the tubing).
3. Disconnect all other tubing, taking each tube in turn and replace with the new tubing; cut to length as necessary – refer to Table 5.3, page 8.
4. Once all tubes have been replaced, reconnect the QD connectors as required.
5. Ensure all tubing is connected and routed correctly, especially drain tubes.
6. Restart analyzer – open sample inlet feed and establish correct flowrate.

Note. It may be necessary to draw reagent solution through the tubing and dosing chamber to prime the system – refer to the hydrazine Operating instructions (OI/AHM550-EN) for details.

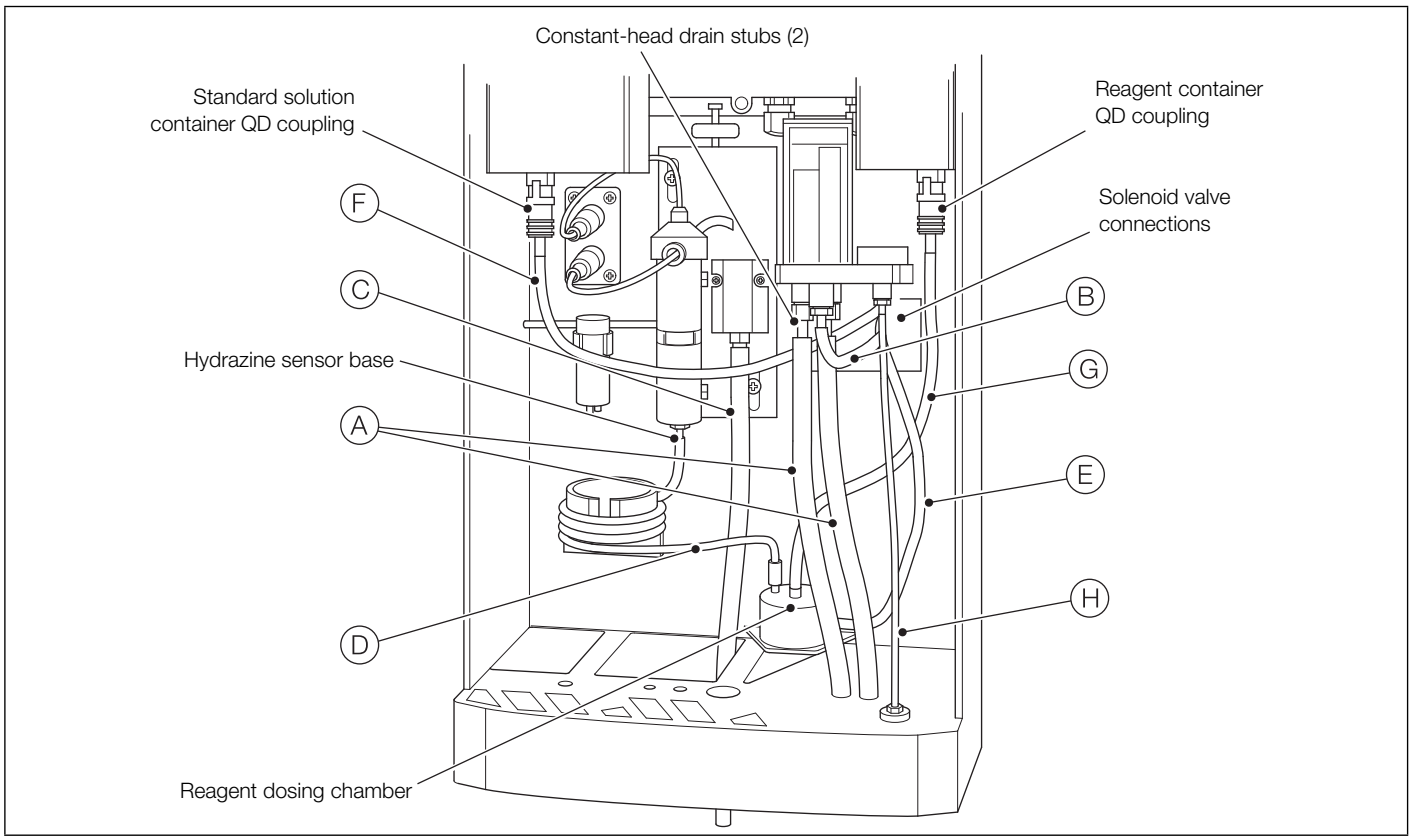


Fig. 5.4 Tubing replacement– hydrazine wet-section

Item	Description	Length mm (in.)	Part number	Quantity
Ⓐ	Drain tubing* (cut into 2 equal lengths of 240 mm [9.45 in.]): constant-head unit to drain outlet emergency constant-head unit to drain outlet	2 x 240 (9.45) cut lengths	0212189*	1*
Ⓑ	Constant-head unit to solenoid valve tube**.	100 (3.93)	0212186**	1**
Ⓒ	Drain tube – hydrazine sensor to drain.	1500 (59.0)	0212156	1
Ⓓ	Mixing coil tube.	–	AW503171	1
Ⓔ	Sample inlet tube – solenoid valve to dosing chamber (base).	–	AW503166	1
Ⓕ	Calibration solution tube** – QD coupling to solenoid valve.	230 (9.0)	0212186**	1**
Ⓖ	Reagent tube** – QD coupling to dosing chamber.	280 (11.0)	0212186**	1**
Ⓗ	Sample inlet to constant-head unit tube.	210 (8.27)	0212362	1

Table 5.3 Replacement tubing lengths / part numbers

*Tubing 0212189 (item Ⓐ) is supplied as 1 x 480 mm (18.9 in.) length and must be cut to make 2 x 240 mm (9.45 in.) lengths.

**Tubing 0212186 (items Ⓑ, Ⓕ, Ⓖ) is supplied as 1 x 610 mm (24.0 in.) length and must be cut to make 3 lengths:

- item Ⓑ – 1 x 100 mm (3.93 in.) cut length
- item Ⓕ – 1 x 230 mm (9.0 in.) cut length
- item Ⓖ – 1 x 280 mm (11.0 in.) cut length

Notes

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