Quantium 110 & 210

Maintenance Manual

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06/2010

Great care has been taken in the preparation of this manual however Tokheim shall not be liable for any misunderstanding, errors and/or loss or defect arising from the use of this manual.

Tokheim shall not be liable for damage to the product, nor for personal or third party injury, caused by incorrect use of the product or by attempts to maintain or to repair the product by parties other than those fully trained by Tokheim or by its accredited third party representatives.

Please contact your nearest service department, at the relevant address printed on the back cover of this manual, should any aspect of this manual be unclear.

Tokheim reserves the right to apply changes to this document and the equipment without further notice.

REVISION RECORD

Date	Revision	Page	Reason
30/06/2010	1	All	Original Issue

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1 INTRODUCTION

1.1 How To Use This Manual

It is recommended that all relevant persons familiarise themselves with the contents of this manual prior to carrying out any operations or procedures.

This manual is divided into sections which are described as follows: -

Section 1 - Introduction

This section contains information on how to use the manual, the scope of equipment covered, recommendations on qualified technicians and contact information. It also includes relevant health and safety information required for the safe practice of common maintenance procedures.

Section 2 - Maintenance Procedures - General

This section describes the safety procedures to be followed during planned servicing of dispensers or emergency repair work. It also contains a description of the dispenser sides and how to access to the dispenser hydraulic and electronic areas.

Section 3 - Maintenance Procedures - Hose Mechanics

This section covers hose and nozzle replacement.

Section 4 - Maintenance Procedures - Hydraulics

In this section, the most common hydraulic maintenance procedures are explained, from a simple filter replacement through to changing the motors and meters.

Section 5 - Maintenance Procedures - Electronics

The basic electronic maintenance is covered in section 6 including changing fuses, batteries and pulsers.

Section 6 - Maintenance Procedures - Vapour Recovery

The maintenance procedures relating to the vapour recovery system is explained in this section which covers the replacement of the VR pump, motor and V-belt.

Section 7 - Drawings

All necessary drawings required for reference during maintenance procedures are listed and contained in this section.

1.2 Product Scope

The equipment and models covered by the contents of this manual are: -

The Quantium 110 & 210 range of fuel dispensers, with the exception of the LPG versions. For information on Quantium LPG dispensers refer to the relevant LPG manual as provided by Tokheim.

All dispensers in the Quantium 110 & 210 ranges use the same standard sub-assemblies and offer a wide range of configurations and includes provision for options such as vapour recovery etc.

1.3 Authorised Technicians

Only qualified technicians familiar with the contents of this manual should carry out the procedures contained herein.

WARNING: ANY ATTEMPTS TO CARRY OUT THE PROCEDURES OF THIS MANUAL, BY UNQUALIFIED OR UNAUTHORISED PERSONS, MAY RESULT IN SERIOUS INJURY OR LOSS OF LIFE.

NOTE: THIS MANUAL IS NOT INTENDED TO REPLACE THE SERVICES OF A FULLY QUALIFIED TECHNICIAN.

1.4 Contact Information

For information relating to the contents of this manual please contact: -

Technical Author
Tokheim UK Ltd.
Dundee, Scotland
author@dundee.tokhiem.com

For technical assistance please contact the appropriate service division listed on the back cover of this manual.

1.5 Health & Safety

1.5.1 SAFETY CHECKLIST

- It is obligatory that this checklist be fully complied with during all work at the petrol station, particularly construction or repair work.
- It is the duty of the contractor to ensure that all workers employed by him obey each and all of the relevant laws, directives and other regulations.

Areas where special caution is required

- The insides of tanks, tubes, dome shafts, filling shafts, change over shafts, vessels and dispensers.
- All areas in which fuel vapour that is heavier than air can accumulate, e.g. fuel separator, draining shafts, low located rooms, cellars, excavations, pipe trenches etc.
- The areas around the outlets of tank ventilation pipes, especially during the filling phase.
- All areas near dispensers, tanker lorries and other vehicles while they are being tanked up, and particularly when there is a lack of wind.
- A radius of 1.0 metres around petrol carrying pipes, as well as pipes that are not vapour free.
- Silt traps.

1.5.2 DUTIES OF THE EMPLOYEES

- To ensure optimal accident prevention in our company, in addition to general rules applying to worker’s protection, it is necessary to take into account all the national protection of workers legislation and to actively support all measures which enhance safety standards.

- It is an employee's duty to follow all company directives regarding the prevention of accidents, unless such directives can be proved to be unfounded.
- Employees should not follow any instructions that go against safety standards.
- Employees are only permitted to use equipment for its original purpose, and this is defined by the company alone.
- If an employee detects equipment that is deficient in terms of safety, he shall eliminate this deficiency immediately. If such safety rectification is not part of his defined area of activities, or if his knowledge is insufficient to carry out such work he must immediately inform his superior about the detected safety deficiency.

This equally applies to:

1) **Work Materials** which have not been correctly packed or correctly marked in order to meet safety requirements.
2) **Work Methods** or work processes which have not been correctly coordinated or controlled in order to meet safety requirements.
3) **Where dangerous activities are carried out by several persons**, the need for a permanent faultless communication between them in order to avoid dangerous events shall require the appointing of one person in order to carry out overall supervision.

1.5.3 Hazards

Prior to starting work, the dispenser must be isolated (i.e. entirely disconnected from the mains supply) and the mains supply switch locked in the OFF position. The submerged pump (if applicable) and control signals from the dispenser must also be isolated. This is done to provide safety for the technician. As a further precaution, switch off the mains supply in the service station shop and place a clear notice on the switch to avoid it being turned on again inadvertently.

WARNING: THE CONNECTION AND DISCONNECTION OF ELECTRICAL CONNECTIONS MAY ONLY BE CARRIED OUT BY QUALIFIED PERSONNEL AUTHORISED FOR SUCH ACTIVITIES. WORK IN DANGEROUS AREAS MUST BE MADE SAFE BY OBSERVING ALL THE NATIONAL SAFETY REQUIREMENTS IN FORCE.

It is not permitted to put a fuel dispenser into operation before an authorised official has inspected it and released it. This depends upon the national regulations in force.

Dismantled packaging and cladding must be stored in such a way as to avoid damage to components or injuries to persons. Covers that can be opened, such as the calculator housing, should be handled with care. Ensure that the retaining catch is placed in the correct position to prevent the cover falling onto the head of the service engineer or other persons in the area.

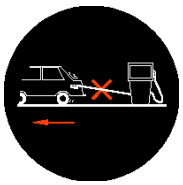
At unattended service stations, every end-user should be able to read the User Instructions. They should be visible on a notice board or integrated into the DIT and should be sufficiently well lit so that they can be read at night.

At unattended service stations break away couplings must always be used to reduce the danger caused by a motorist driving off with the nozzle still in the tank.

NOTE : A HIGHLY VISIBLE CORDON MUST BE PLACED AROUND THE DISPENSER THAT IS BEING SERVICED.

1.5.4 WARNING SIGNS

The following warning signs are fitted as standard, on the dispenser, however they may vary according to individual country requirements or customer specifications.

SIGN	MEANING	POSITION
	Do not use mobile phones	Visible from both sides of dispenser
	No naked flames	Visible from both sides of dispenser
	Do not spill fuel on the ground	Visible from both sides of dispenser
	Smoking forbidden	Visible from both sides of dispenser
	Stop vehicle engine	Visible from both sides of dispenser
	Trucks only	At Diesel high speed dispensers near the nozzle boots
	Do not drive away with nozzle in tank	Visible from both sides of dispenser
		Next to User Instructions near the nozzle boot

1.5.5 PERSONAL PROTECTIVE EQUIPMENT (PPE)

PROTECTIVE CLOTHING

The following clothing should be worn **at all times** during installation and maintenance procedures:-

- Protective helmet.
- Protective shoes (conductive).
- Protective gloves and/or protective hand cream.
- Anti static clothing.
- Eye protection.

SAFETY EQUIPMENT FOR WORKING IN HAZARDOUS AREAS

The following safety equipment is required for working in hazardous areas:-

- Only spark free tools are permitted for work on dispensers.
- Work on bearings is only permitted using the standard workshop tools authorised for this kind of work.
- The use of all electrical tools is strictly prohibited.
- Only the use of explosion protected work lights is permitted.
- The use of telecommunications equipment in hazardous areas is strictly prohibited.

SAFETY INSTRUCTIONS

The following safety instructions must be adhered to during installation and maintenance procedures:-

- Inhalation of petrol vapour must be avoided. Suitable precautions must be taken and where necessary respirators used.
- Avoid direct contact of fuel with the skin.
- Use suitable protective clothing, protective gloves and/or protective hand cream.
- Avoid fuel spills.
- No smoking, no naked flames are permitted.
- Long hair and ties can get caught in moving parts. Hair must be suitably covered.

1.6 Standards & Certificates

This dispenser is constructed in conformity with the requirements of all the applicable European Directives (Machinery 2006/42/EC; EMC 89/336/EEC; ATEX 94/9/EC).

The components used within the dispenser, including connection facilities, are selected in accordance with the European Standard EN BS 60079-0 (Electrical Apparatus for explosive gas atmospheres), and the supplementary Standards listed therein.

Diesel dispensers do not create an explosive hazard, but due to the probability of these being in close proximity to gasoline dispensers, the same construction rules are applicable.

The dispenser is certified by SIRA as suitable for use in Potentially Explosive Atmospheres Directive 94/9/EC, and marked to be in accordance with the European Dispenser Construction Standard EN 13617-1.

This dispenser is also certified to OIML International Recommendations R117 and R118. Certificate Numbers R117/1995-NL-01.04 & 08.

The production and end test is controlled through the Quality Assurance systems within the Tokheim Manufacturing Centres, and has received Quality Assurance Notification from a Notified Body.

No modification to the dispenser may be performed without express permission from Tokheim and must always use original components or Tokheim retrofit kits. Failure to comply with the above will invalidate product conformance with the relevant European Directives and Tokheim will no longer accept product liability.

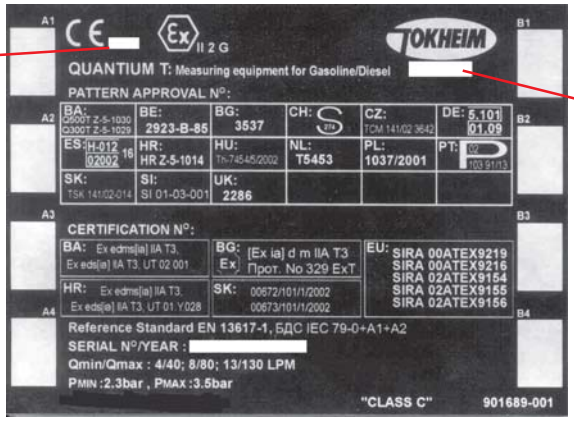
1.6.1 DISPENSER MARKING FOR THE ATEX DIRECTIVE

The dispenser is labelled by Tokheim in accordance with the requirements of the ATEX Directive. This labelling includes:-

- The CE mark (CE conformity)
- The specific explosion protection mark, together with the mark indicating the equipment group and category; and, relating to equipment group II, the letter “G” (concerning explosive atmospheres caused by gases and vapours)
- The “Tokheim” name or logo and manufacturing location
- The dispenser type and serial number including the year of production

Labels can either be plastic stickers or metal plates and may vary according to national requirements. A typical example of a label follows:-

0518 SIRA
or
0081 LCIE



DUNDEE
or
GRENTHEVILLE

1.6.2 SPECIAL CONDITIONS FOR SAFE USE

Certain models include Special Conditions for Safe Use which must be observed prior to putting the dispensers into operation. Failure to do so will invalidate the ATEX certification of the dispenser. These models can be identified by an X at the end of the certificate number as shown on the dispenser typeplate.

The Special Conditions for Safe Use are identified in the ATEX EC Type-Examination Certificates and are repeated below:-

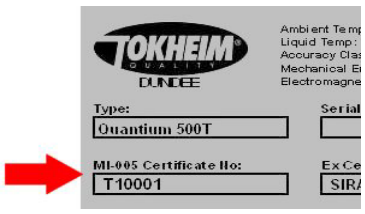
- Where a dispenser is supplied without hoses and/or nozzles, they shall be fitted in accordance with:
  - Hoses : EN1360 or EN13483
  - Nozzles: EN13012
- When used for ethanol (blend) dispensing, the fuel specification must be less than or equal to 85% ethanol, with minimum water content.
- The metering pumps and dispensers are designed for use in open air. Where a metering pump or dispenser is positioned within a building, incorporated into an enclosure, or integrated into a larger piece of equipment, additional measures shall be taken to ensure that the zoning diagrams illustrated in the schedule drawings are not compromised.

1.7 MID Dispensers

From mid 2007, Tokheim dispensers may be shipped from European factories in accordance with the Metrological Instruments Directive (MID). Such dispensers are calibrated and the relevant seals stamped in the factory so that the dispensers are fit for trade immediately upon installation without the need for a local Weights and Measures inspector to put them into use.

The dispenser is shipped with its own "MID datasheet" which documents the serial numbers of the prime components fitted in the dispenser. This datasheet must remain with the dispenser. Similarly dispensers are shipped with a Declaration of Conformance to the MID. This document must not be lost as it is an essential document to allow the continued use of the dispenser.

MID dispensers can be identified by the typeplate which contains a reference to the MID certificate number as shown:-



CHECKING THE SEALS

It is the responsibility of the Installer to check that all required seals are present and correct prior to putting the dispenser into use. This includes seals on the pumping unit, meter, pulser and calculator. **Under no circumstances must any seals be disturbed or broken during installation.**

METER CALIBRATION

A calibration check should be performed during Commissioning.

If a seal is damaged or missing, or if the calibration is outwith legal tolerances or in the unlikely event that any repair is required to a pumping unit, meter, pulser or calculator during installation, the factory MID verification is invalidated and a local National verification will need to be performed before the dispenser can be used.

CONTENTS

2 MAINTENANCE PROCEDURES - GENERAL

2.1 General

The photographs used in this manual are specific to either the Q110 or Q210 dispenser but, unless otherwise stated, the procedure will be identical for both dispensers.

For part identification, please consult the Parts Manual.

Always follow the safety checklist as detailed in Section 1.5.

Before starting any maintenance procedure:-

- Ensure that all necessary tools and replacement parts are available.
- Ensure the dispenser is isolated and all power is turned off.
- When working on or near a dispenser, always act in accordance with general safety rules and regulations.
- Cordon off the dispenser under repair.
- Wear appropriate Personal Protective Clothing as recommended in Section 1.5.5.

2.2 Important Safety Information relating to IS Circuits

The Quantium T range of dispensers includes Intrinsically Safe (IS) circuits. The intrinsically safe cables are normally identified by blue coloured cables or cables marked at both ends with blue sleeving. IS circuits connect to nozzle switches, preset push buttons and to the Vapour Flow Meter (where fitted).

Cables for the IS circuits require careful routing and must remain segregated from all other cabling, both in the hydraulic and electronic areas of the dispenser. During maintenance or service procedures, ensure that the routing of the IS cables is unaltered and that the IS cables do not share cable glands and are not tied to any other non-IS cables.

In order for a circuit to remain intrinsically safe, there is a limit to the number of devices which can be simultaneously connected to it. For example, the nozzle bus also connects to preset button sensors and various hall effect sensors. The maximum number of devices is dependent upon both the electronic characteristics of the individual device and the length of cable used for the connection. No modifications should be made to the dispenser IS circuits unless under direct instruction or by the use of specific Tokheim retrofit kits.

2.3 Identification of Sides A and B

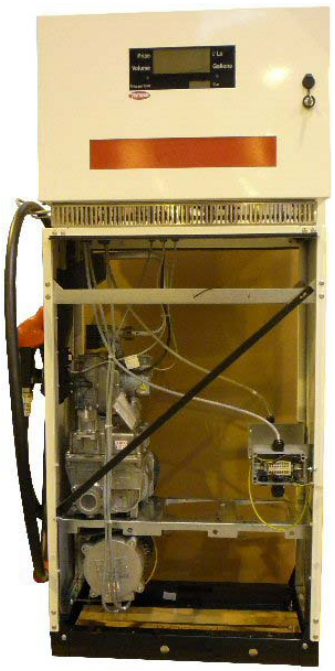
The different sides of the dispenser referred to in this manual are described as follows:-

- Side A of the dispenser has the pulleys and inlet connections (visible upon removal of hydraulic doors). All single hose models have the hose on the right hand side when facing side A.

Side A

- Side B of the dispenser has the electrical supply and air vent holes in the base of the dispenser. All single hose models have the hose on the left side when facing side B.

Side B



2.4 Removal of the Hydraulic Access Panels

The following instructions detail the procedure to be followed for the safe removal of the hydraulic access panel(s).

INSTRUCTIONS

1) Locate the key for the hydraulic access panel.
2) Unlock the hydraulic access panel.

3) Carefully lift out the panel.

Note - the panel is still attached by a retaining cord, earth and/ or electrical cables.

4) Disconnect the retaining cord, earth and/or electrical cables from the panel door.

5) Lift up the panel to release from the drive pins in the base and remove the hydraulic access panel completely.

6) Repeat for opposite side of dispenser as required.
7) Place the hydraulic access panel(s) in a safe position.
8) To re-fit the hydraulic access panels, follow the instructions in reverse.

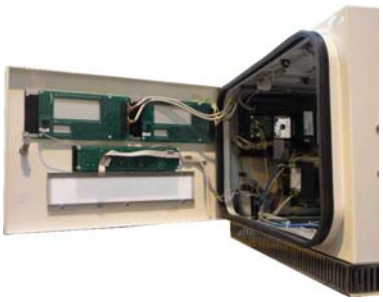
2.5 Access to the Calculator Head

The following instructions detail the procedure to be followed for the safe access to the calculator head.

INSTRUCTIONS

1) Locate the key for the calculator head door.
2) Unlock the calculator head door on the relevant side of the dispenser.
3) Carefully open the calculator head door.

Note : the door is still attached by electrical and/or earth cables.



4) Secure the calculator head door in the open position.
5) Repeat for opposite side of dispenser as required.
6) To close and lock the calculator head door, follow the instructions in reverse.

Note : ensure the electrical and/or earth cables remain inside when closing the calculator head door.

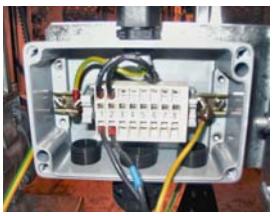
2.6 Access the Junction Box

2.6.1 BERNSTEIN JUNCTION BOX

The following instructions detail the procedure to be followed to allow safe access to the junction box connections.

INSTRUCTIONS

1) Follow the instructions given to access the hydraulic area.
2) Locate the Junction Box in the hydraulic area.
3) Using a screwdriver, loosen and remove the four screws on the junction box cover and remove completely.
4) Refer to the wiring diagrams in section 5.
5) To re-fit the junction box cover, follow the instructions in reverse.

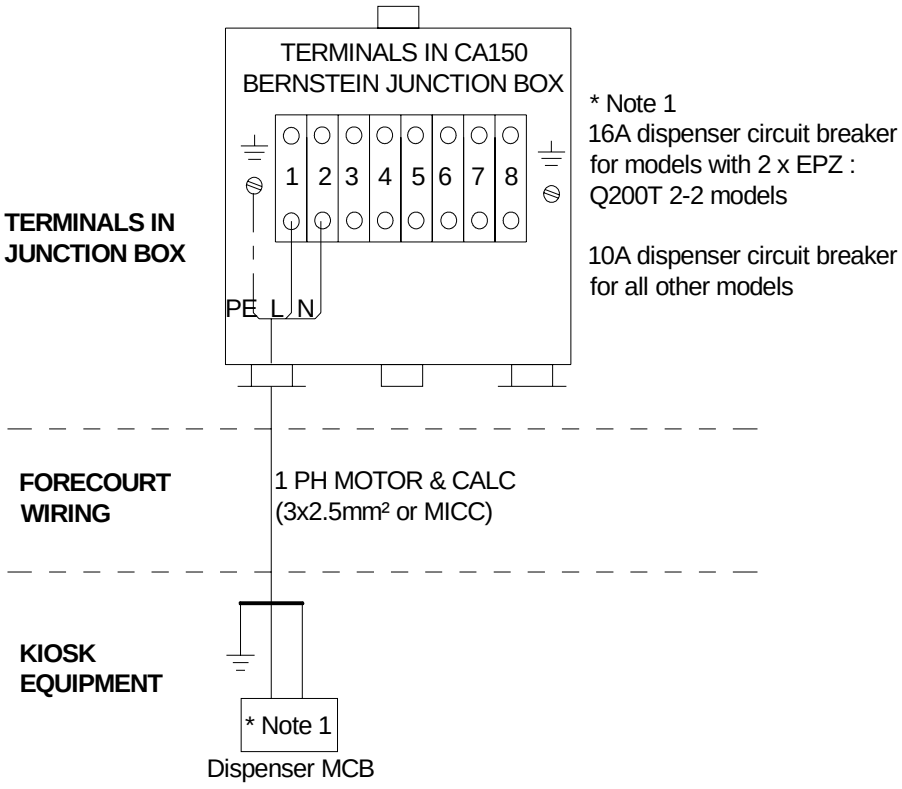


2.6.2 JUNCTION BOX WIRING

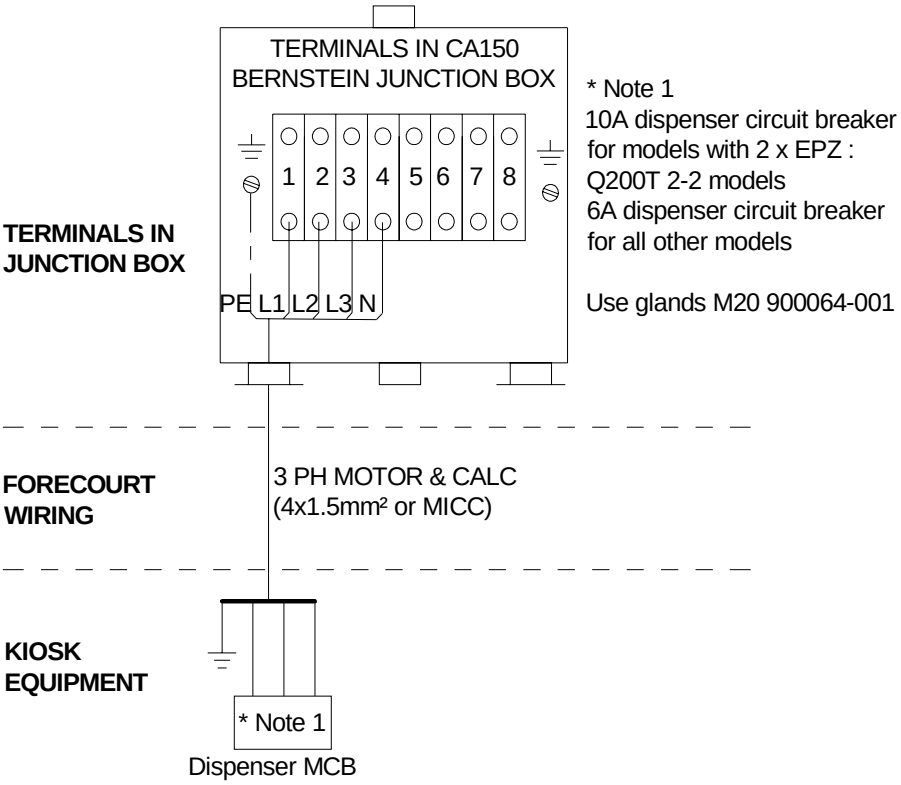
IMPORTANT :- ENSURE THE CORRECT WIRING DIAGRAM IS FOLLOWED.

5) When complete, re-fit the junction box cover.
6) Ensure that all tools and unused materials are removed, close the hydraulic door and lock.
7) Re-instate power to the dispenser and test its operation.

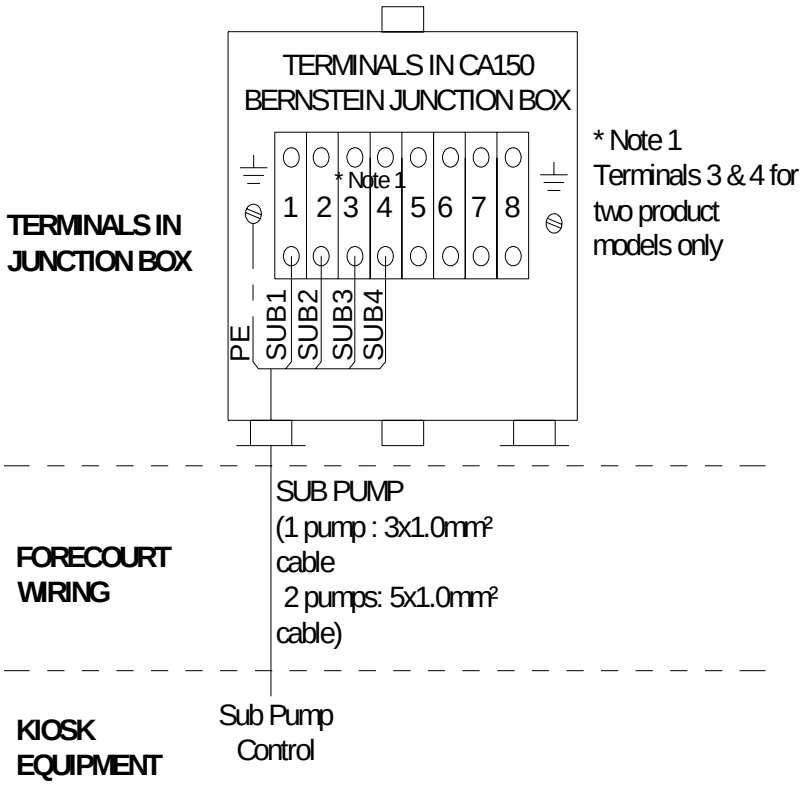
Junction Box - Single Phase Suction



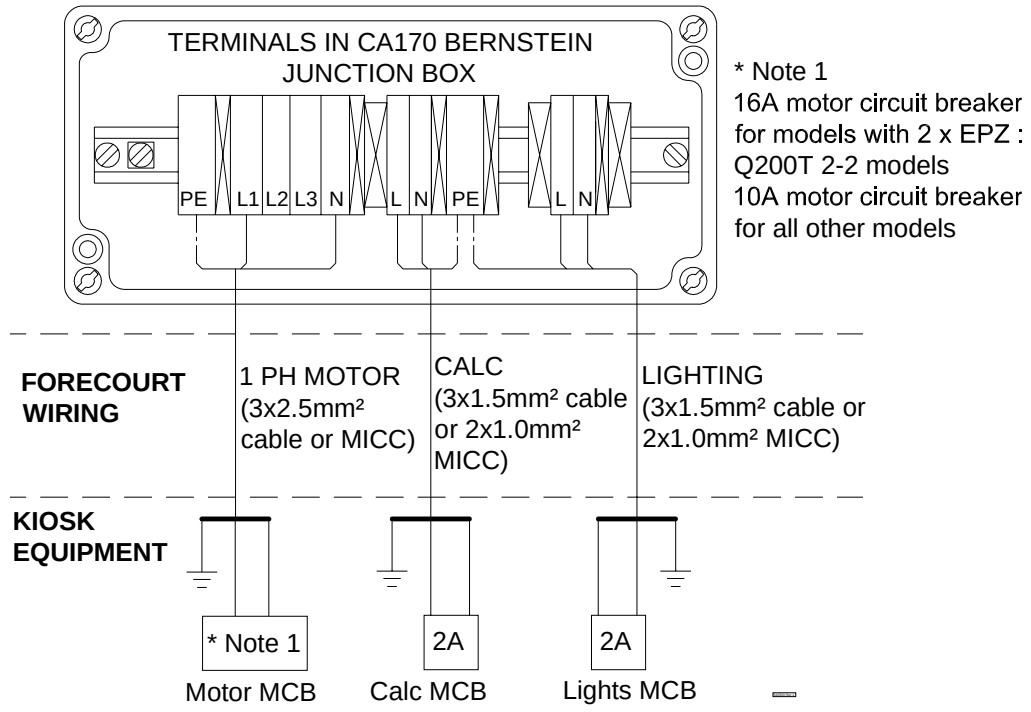
Junction Box - Three Phase Suction



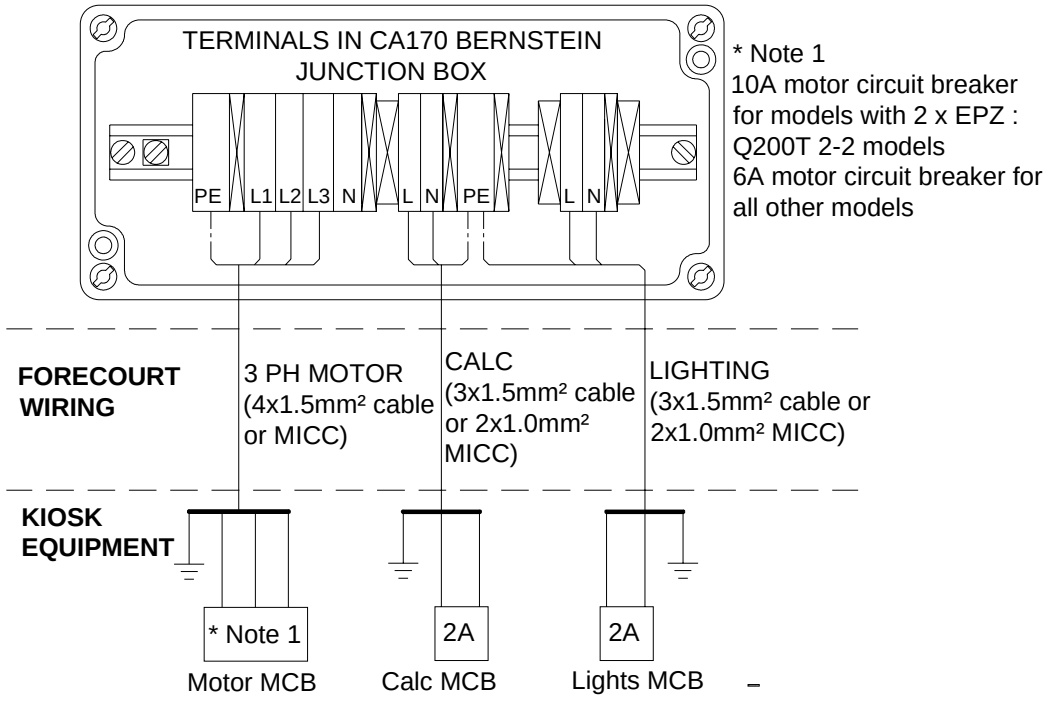
Junction Box - Submerged



Junction Box - Single Phase Suction (SPLIT POWER OPTION)



Junction Box - Three Phase Suction (SPLIT POWER OPTION)



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CONTENTS

3 MAINTENANCE PROCEDURES - HOSE MECHANICS

3.1 Changing a Nozzle

Before starting the maintenance procedure, please refer to section 2.

Identify the relevant nozzle to be replaced.

Tools required

- Replacement nozzle
- Spanner for hose connection (36mm for 16mm hose, 41mm for 21mm hose, 46mm for 25mm hose)
- Spanner for nozzle (36mm, 41mm or 46mm)

INSTRUCTIONS

1) Using one spanner to hold the hose connection stationary, disconnect the nozzle from the end of the hose using the second spanner. Drain excess fuel into a suitable container.

WARNING : BEWARE OF FUEL SPILLAGE.

2) Connect the replacement nozzle to the end of the new hose.
3) Ensure all tools and unused materials are removed.
4) Re-instate power to the dispenser.
5) Test for any leakages.
6) Dispose of all waste accordingly.

3.2 Changing a Hose

Before starting the maintenance procedure, please refer to section 2.

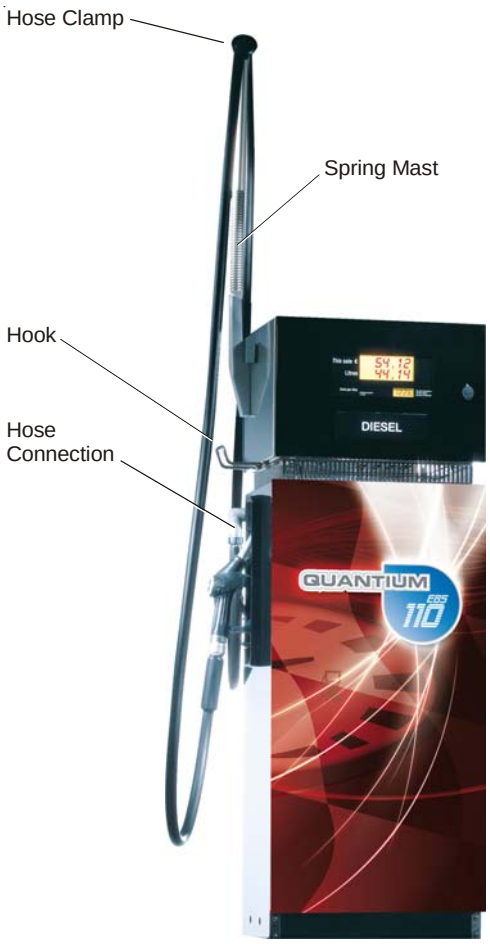
Identify the relevant hose to be replaced.

Tools required

- Replacement hose (refer to the Parts Manual for exact part identification)
- 36mm spanner
- 4mm allen key
- Ladder or similar

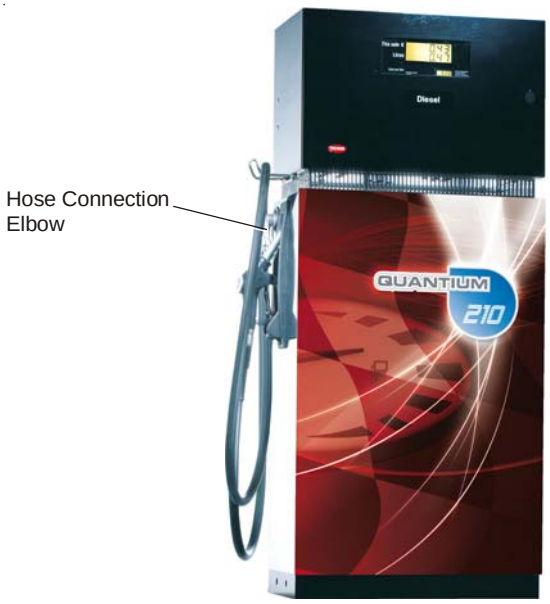
Description of Parts

Identify the dispenser mast connection i.e. rigid mast or spring mast



⚠ CAUTION

Whilst working at height, ensure all relevant safety procedures are observed.



INSTRUCTIONS

1) Using a 36mm spanner, disconnect the hose from the hose connection elbow on the dispenser. Drain excess fuel into a suitable container.

2) **Rigid Mast only** : Using a 36mm spanner, disconnect the hose from the connection on the rigid mast. Drain excess fuel into a suitable container.

WARNING : BEWARE OF FUEL SPILLAGE.

Spring Mast only : Using a 36mm spanner, disconnect the hose from the connection at the top of the dispenser. Drain excess fuel into a suitable container.

WARNING : BEWARE OF FUEL SPILLAGE.

3) **Spring Mast only :** Using a 4mm allen key, disconnect the hose clamp to release the hose.

4) Follow the instructions given in section 3.1 to remove the nozzle.

WARNING : BEWARE OF FUEL SPILLAGE.

5) **Rigid Mast only :** Connect the new hose to the rigid mast.

6) **Spring Mast only :** Connect the new hose to the top of the dispenser.

Spring Mast only : Re-connect the hose clamp to the new hose.

7) Re-connect the nozzle to the end of the new hose.

8) Ensure all tools and unused materials are removed.

9) Re-instate power to the dispenser.

10) Test for any leakages.

11) Dispose of all waste accordingly.

3.3 Changing an Elaflex Safety Break Coupling

Before starting the maintenance procedure, please refer to section 2.

To repair a separated Elaflex safety break coupling, refer to section 3.3.1.

Identify the relevant Elaflex safety break coupling to be replaced.

Tools required

- Replacement Elaflex safety break coupling (refer to the Parts Manual for exact part identification)
- Spanner for hose connection (36mm for 16mm hose, 41mm for 21mm hose, 46mm for 25mm hose)
- Spanner for nozzle (36mm, 41mm or 46mm) or large adjustable spanner

Description of Parts

INSTRUCTIONS

1) Locate the damaged safety break coupling on the nozzle.
2) Follow the instructions described in section 3.1 to remove the nozzle (and safety break coupling) from the end of the hose. Drain excess fuel into a suitable container.

WARNING : BEWARE OF FUEL SPILLAGE.

3) Using one spanner to hold the nozzle stationary, disconnect the safety break from the end of the nozzle using the second spanner. Drain excess fuel into a suitable container.

WARNING : BEWARE OF FUEL SPILLAGE.

4) Connect the new safety break coupling to the relevant nozzle and hose connections using the appropriate sized spanners.
5) Ensure all tools and unused materials are removed.
6) Re-instate power to the dispenser.
7) Test for any leakages.
8) Dispose of all waste accordingly.

3.3.1 RECONNECTING A SEPARATED SAFETY BREAK COUPLING (ELAFLEX RE-USABLE TYPES ONLY)

Before starting the maintenance procedure, please refer to section 2.

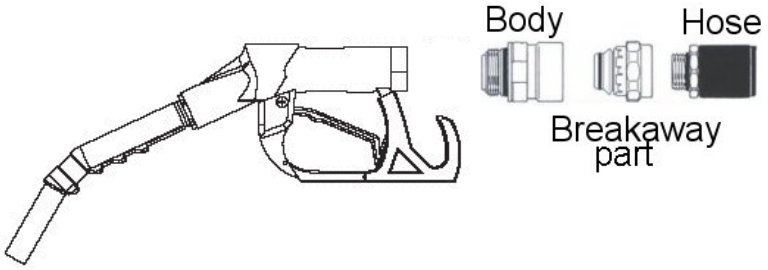
Note: If the nozzle safety break coupling is irreparable then the complete nozzle/safety break assembly must be replaced (refer to section 3.3).

Identify the relevant safety break coupling to be repaired.

Tools required

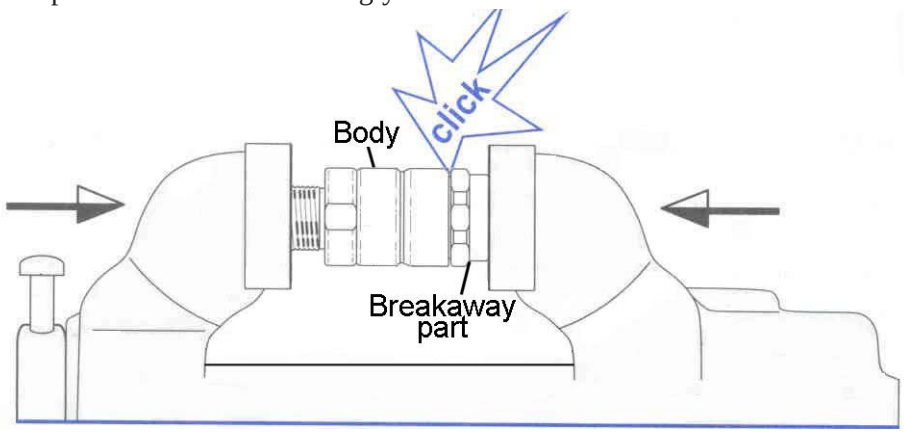
- Vice or clamping device

Description of Parts



INSTRUCTIONS

1) Follow the instructions given in section 3.3 to remove **BOTH PARTS** of the separated safety break coupling.
2) Place both parts of the safety break coupling into a vice or similar clamping device and push together until an audible “click” is heard.
3) Re-fit the safety break coupling as described in section 3.3.
4) Ensure all tools and unused materials are removed.
5) Re-instate power to the dispenser.
6) Test for any leakages.
7) Dispose of all waste accordingly.



3.4 Changing a Nozzle Reed Switch

Before starting the maintenance procedure, please refer to section 2.

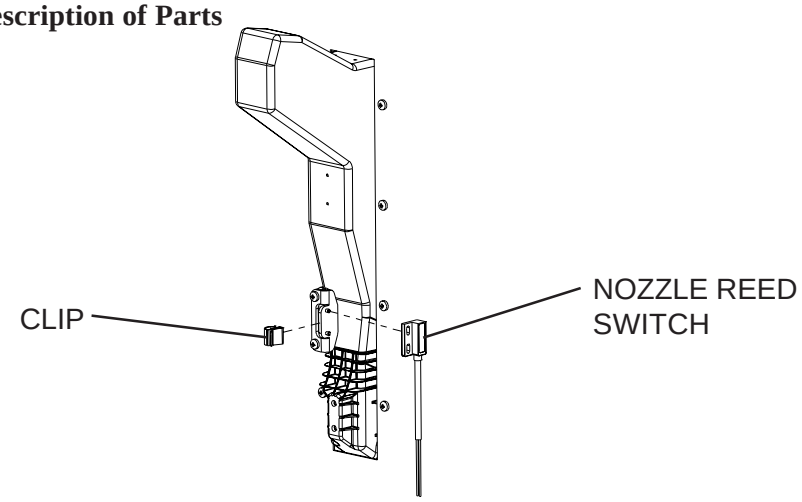
Ensure the dispenser is isolated and all power is turned off.

Identify the relevant side of the dispenser with the nozzle reed switch to be replaced (see section 2.3 for the identification of the dispenser sides). The nozzle connection is accessed from either side A or side B of the calculator head (model dependent).

Tools required

- Replacement nozzle reed switch (refer to the Parts Manual for exact part identification)
- Small flathead screwdriver
- 24mm spanner
- 5.5mm nut runner
- Wirecutters

Description of Parts



INSTRUCTIONS

1) Follow the instructions given in sections 2.4 and 2.5 to access the calculator head and cable glands.
2) Locate the nozzle reed switch to be changed and carefully lift the relevant nozzle out of the nozzle boot and place in a safe position on the ground.

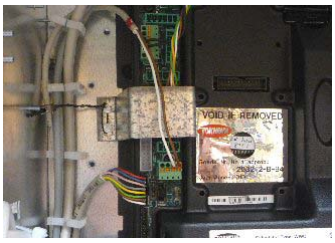
WARNING : BEWARE OF FUEL SPILLAGE.

3) Remove the relevant hydraulic door as described in section 2.4.
4) Locate the nozzle reed switch on the back of the nozzle boot. Remove the clip securing the nozzle reed switch to the nozzle reed switch bracket.

5) Remove the nozzle reed switch from the nozzle reed switch bracket.
6) Trace the nozzle reed switch cable up the dispenser and into the calculator head.

Note : the nozzle reed switch cable has identification tags at each end.

7) Locate the nozzle reed switch cable connection in the calculator head:-



•**Mainboard connection** - locate the nozzle switch cable connection on the mainboard.

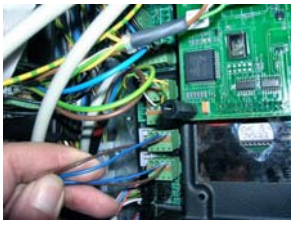
8) Disconnect the nozzle reed switch cable connector from the relevant board in the calculator.

Note : Take care to note the position of this connector on the relevant board.

9) Using a small flathead screwdriver, remove the connector from the nozzle reed switch cable.

WARNING : NOTE THE ORDER OF THE COLOURED WIRES IN THE CONNECTOR.

10) Use a 24mm spanner to loosen the relevant glands securing the nozzle reed switch cable. Pull the entire cable through the glands and remove the switch and cable completely.



11) Fit the new nozzle reed switch to the nozzle reed switch bracket and secure into position using the clip.

12) Feed the nozzle reed switch cable up and through the relevant glands into the calculator head. Secure the cable in position by tightening the relevant glands.

13) Use the small flathead screwdriver to connect the wires to the correct connector.

14) Plug the connector into the relevant board in the calculator head.

15) Re-fit the side panel to the dispenser.

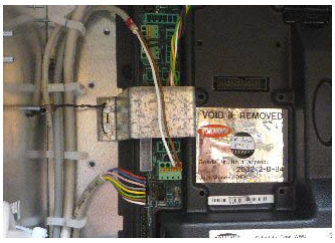
16) Close the calculator head door and lock.

17) Close the hydraulic door and lock.

18) Replace the nozzle(s) securely in the nozzle boot(s).

19) Ensure all tools and unused materials are removed.

20) Re-instate power to the dispenser.



21) Test operation of the new nozzle switch.

22) Dispose of all waste accordingly.

CONTENTS

4 MAINTENANCE PROCEDURES - HYDRAULICS

4.1 Changing the internal filter on the TQP pump

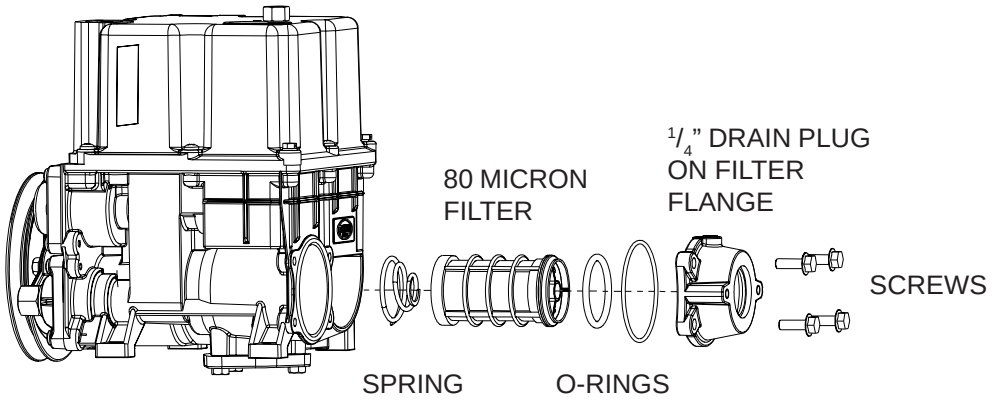
Before starting the maintenance procedure, please refer to section 2.

The filter is accessed from side B of the dispenser (see section 2.2 for the identification of the dispenser sides).

Tools required

- 80 micron replacement filter (refer to the Parts Manual for exact part identification)
- Replacement O-ring (if required) (refer to the Parts Manual for exact part identification)
- Replacement gasket for flexible connection (refer to the Parts Manual for exact part identification)
- 13mm spanner
- 7mm allen key
- Loctite 577 sealant
- Suitable high vacuum grease

Description of Parts



INSTRUCTIONS

1) Follow the instructions given in section 2.4 to gain access to the hydraulic area.

2) Locate the drain plug on top of the filter flange on the relevant TQP pump.

3) Using a 7mm allen key, loosen and remove the drain plug. Drain excess fuel into a suitable container.

WARNING : BEWARE OF FUEL SPILLAGE.

4) Using a 13mm spanner, loosen the two bolts on the flange on the flexible connection at the back of the TQP pump.

Disconnect the flange and flexible connection from the TQP pump.

WARNING : BEWARE OF FUEL SPILLAGE.

5) Using a 13mm spanner, loosen and remove the four bolts on the filter flange.

6) Carefully remove the filter flange and filter from the TQP pump.

Note : there may be a release of pressure during this procedure.

Drain excess fuel into a suitable container.

WARNING : BEWARE OF FUEL SPILLAGE.

7) Remove the spring from inside the TQP pump.

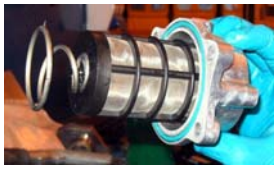
Note : the check valve assembly should remain inside the pump during the filter removal.

8) Remove the O-ring from inside the filter flange and fit to the new filter. Use a suitable high vacuum grease (e.g. NLG2) to lubricate both O-rings.

Note : use new O-rings where required.

9) Push the new filter into the flange until secure.

10) Grease the end of the filter and attach the spring.
11) Replace the filter assembly into the TQP pump.
12) Re-fit the four bolts on the filter flange and tighten securely using the 13mm spanner.
13) Re-fit the drain plug using Loctite 577 and 7mm allen key.
14) Using a 13mm spanner, re-fit the flange and flexible connection to the pump using a new gasket.



15) Ensure that all tools and unused materials are removed.
16) Secure the hydraulic door to the dispenser and lock.
17) Re-instate power to the dispenser.
18) Dispose of all waste accordingly.

4.2 Changing the external filter on pumps with filterbox

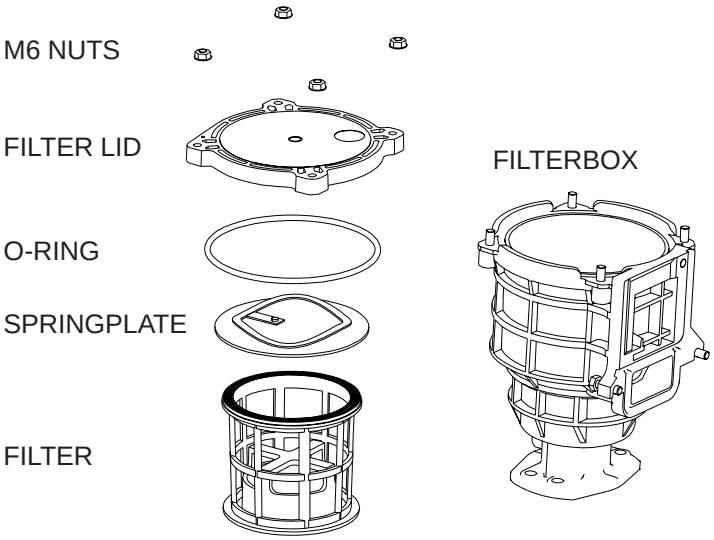
Before starting the maintenance procedure, please refer to section 2.

The filter is accessed from side B of the dispenser (see section 2.3 for the identification of the dispenser sides).

Tools required

- Replacement filter (refer to the Parts Manual for exact part identification)
- Torque wrench
- Replacement O-ring

Description of Parts

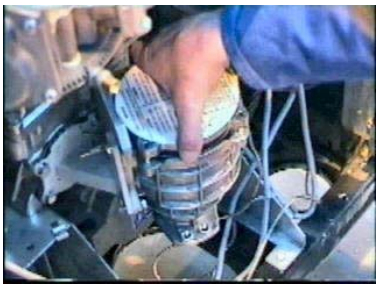


INSTRUCTIONS

1) Follow the instructions given in section 2.4 to gain access to the hydraulic area.

2) Locate the filter box to be replaced.

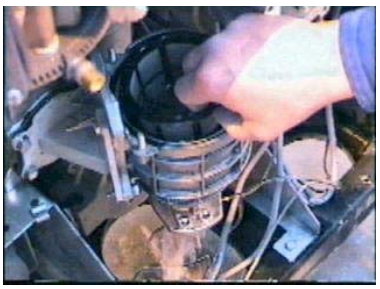
3) Using the torque wrench, loosen and remove the four nuts on the filter box lid.



4) Carefully prise off the filter box lid and o-ring and remove completely.

   Note : there may be a release of pressure during this procedure.

5) Remove the filter spring plate below the filter box lid.



6) Remove the filter from inside the filter box. Drain excess fuel into a suitable container.

WARNING : BEWARE OF FUEL SPILLAGE.

7) Fit the new filter.
8) Re-fit the filter spring plate.
9) Re-fit the filter box lid using a new o-ring. Use the torque wrench to tighten the four nuts to 5Nm.
10) Ensure that all tools and unused materials are removed.
11) Secure the hydraulic door to the dispenser and lock.
12) Re-instate power to the dispenser.
13) Dispose of all waste accordingly.

4.3 Changing the bypass valve on the TQP pump

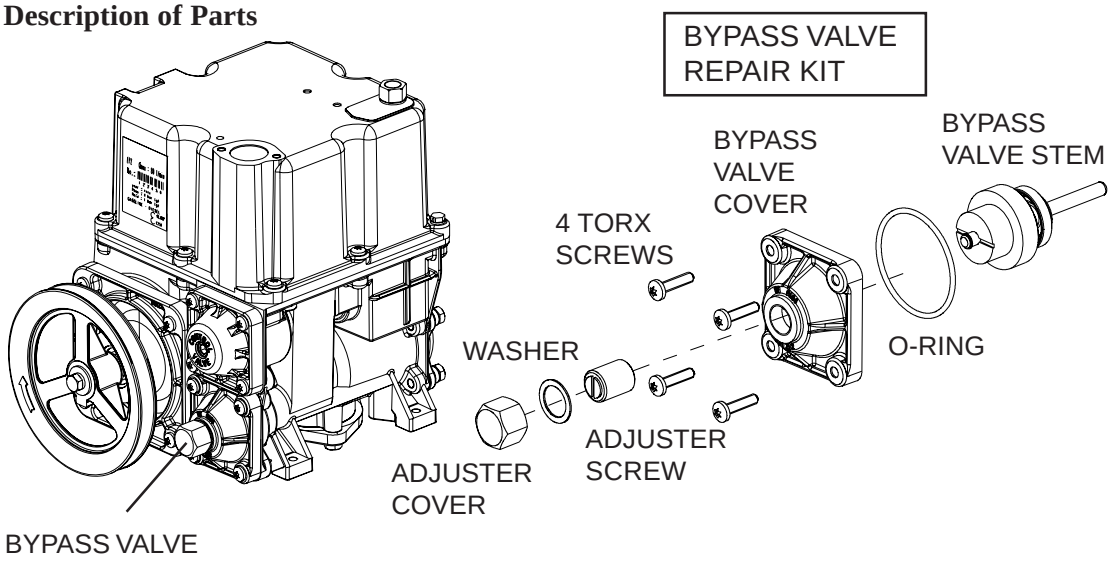
Before starting the maintenance procedure, please refer to section 2.

The bypass valve is accessed from side A of the dispenser (see section 2.3 for the identification of the dispenser sides).

Tools required

- Bypass Valve Repair Kit for TQP Pump (refer to the Parts Manual for exact part identification)
- 24mm spanner
- TX30 bit
- Large flathead screwdriver

Description of Parts



INSTRUCTIONS

1) Follow the instructions given in section 2.4 to gain access to the hydraulic area.

2) Locate the bypass valve cover on the pump.

3) Using the TX30 bit, loosen and remove the four screws on the bypass valve cover. Remove the bypass valve cover completely.

4) Locate and remove the bypass valve stem from the housing.

5) Fit new bypass valve stem into the housing.
6) Re-fit the bypass valve cover.
7) Using the 24mm spanner, remove the adjuster cover.
8) Re-instate power to the dispenser.
9) Using the large flathead screwdriver, adjust the bypass valve as required. Recommended pressure 1.2 to 2.5 bar.

   Note : each turn of the bypass adjuster screw is approximately 0.1 bar.
10) Re-fit the adjuster cover.
11) Ensure that all tools and unused materials are removed.
12) Secure the hydraulic door to the dispenser and lock.
13) Dispose of all waste accordingly.

4.4 Changing the bypass valve on the PAS V3 pump

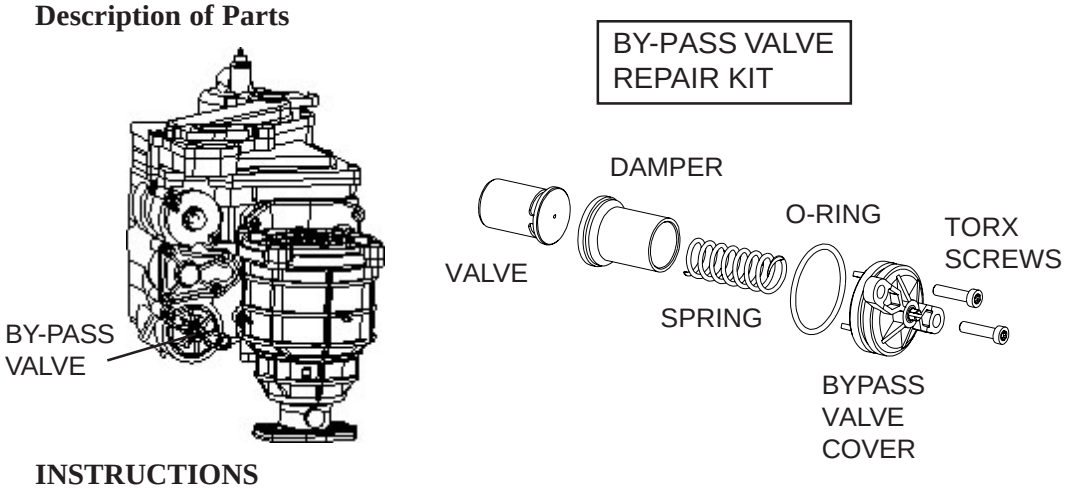
Before starting the maintenance procedure, please refer to section 2.

The bypass valve is accessed from side B of the dispenser (see section 2.3 for the identification of the dispenser sides).

Tools required

- Bypass Valve Repair Kit for PAS V3 Pump (refer to the Parts Manual for exact part identification)
- TX30 bit
- Flathead screwdriver

Description of Parts



INSTRUCTIONS

1) Follow the instructions given in section 2.4 to gain access to the hydraulic area.

2) Locate the bypass valve cover on the pump.

3) Using the TX30 bit, loosen and remove the two screws on the bypass valve cover. Remove the bypass valve cover and o-ring completely.

WARNING : SPRING UNDER TENSION.

4) Carefully remove the bypass valve assembly (spring, damper, valve) from the housing.

5) Fit new bypass valve assembly (spring, damper, valve) into the housing.

6) Re-fit the bypass valve cover using a new o-ring.

7) Re-instate power to the dispenser.

8) Using the flathead screwdriver, adjust the bypass valve as required. Recommended pressure 2 to 2.5 bar (80 litres/minute flow rate) or 2.4 to 3 bar (130 litres/minute flow rate).

9) Ensure that all tools and unused materials are removed.

10) Secure the hydraulic door to the dispenser and lock.

11) Dispose of all waste accordingly.

4.5 Changing the V-belt on the motor

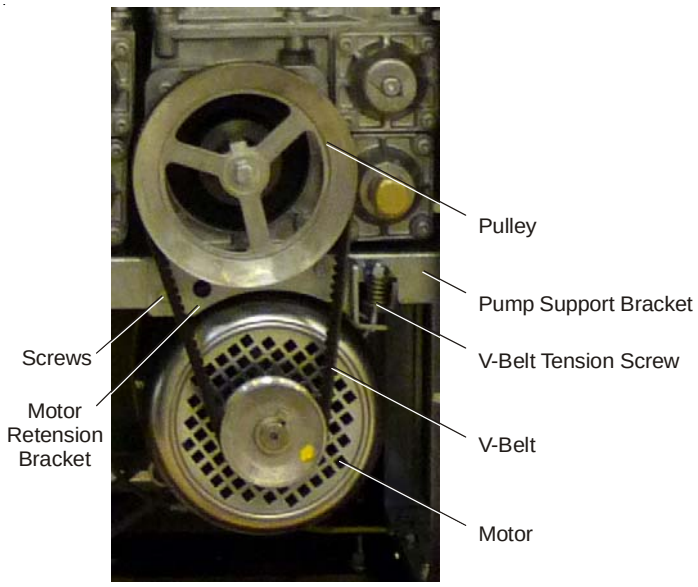
Before starting the maintenance procedure, please refer to section 2.

The motor v-belt is accessed from side A of the dispenser (see section 2.3 for the identification of the dispenser sides).

Tools required

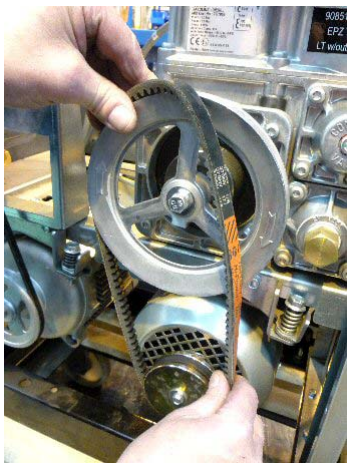
- Replacement motor v-belt (refer to the Parts Manual for exact part identification)
- 13mm spanner
- 10mm spanner

Description of Parts



INSTRUCTIONS

1) Follow the instructions given in section 2.4 to gain access to the hydraulic area.
2) Locate the v-belt to be changed.
3) Using a 13mm spanner, loosen the motor V-belt tension screw. Do not remove.
4) Use the 10mm spanner to remove the two screws holding the motor retension bracket. Let the bracket drop, resting on the motor.
5) Raise the motor slighty with one hand and remove the v-belt with the other hand.
6) Fit new motor v-belt.
7) Replace the screws holding the motor retension bracket, using the 10mm spanner and tighten.
8) Using the 13mm spanner, tighten the motor v-belt tension screw until the correct tension is achieved.
9) Ensure that all tools and unused materials are removed.
10) Re-fit the hydraulic panel to the dispenser and lock.
11) Re-instate power to the dispenser.
12) Test operation of the new v-belt.
13) Dispose of all waste accordingly.



4.6 Changing the pulley on the PAS V3 pump

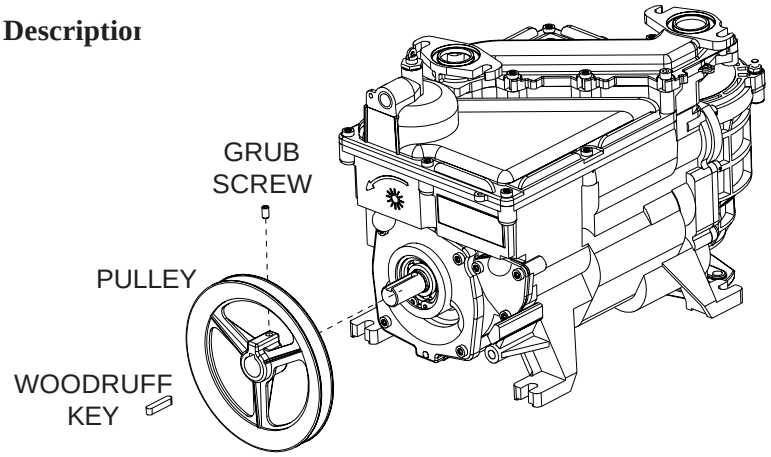
Before starting the maintenance procedure, please refer to section 2.

The pulley is accessed from side A of the dispenser (see section 2.3 for the identification of the dispenser sides).

Tools required

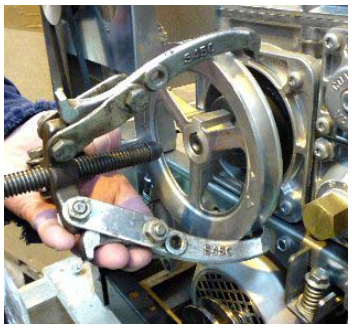
- Replacement pulley (refer to the Parts Manual for exact part identification)
- Puller tool
- 3mm allen key
- 13mm spanner

Description



INSTRUCTIONS

1) Follow the instructions given in section 2.4 to gain access to the hydraulic area.
2) Follow the instructions given in section 4.5 to remove the motor v-belt.



3) Use a 3mm allen key to remove the grub screw on the pulley shaft and place in a safe position.
4) If required, use the puller tool to remove the pulley (and woodruff key) from the PAS pump. Pull from the centre part of the pulley only - do NOT apply force with the puller fingers to the outer edges of the pulley.

Note: Do not lose the woodruff key.

5) Fit new pulley to the PAS pump and re-fit the woodruff key.
6) Apply a little thread sealant and re-fit the grub screw to secure the pulley in position.
7) Re-fit the v-belt and adjust as described in section 4.5.
8) Ensure that all tools and unused materials are removed.
9) Secure the hydraulic door to the dispenser and lock.
10) Re-instate power to the dispenser.
11) Dispose of all waste accordingly.

4.7 Changing the pulley on the TQP pump

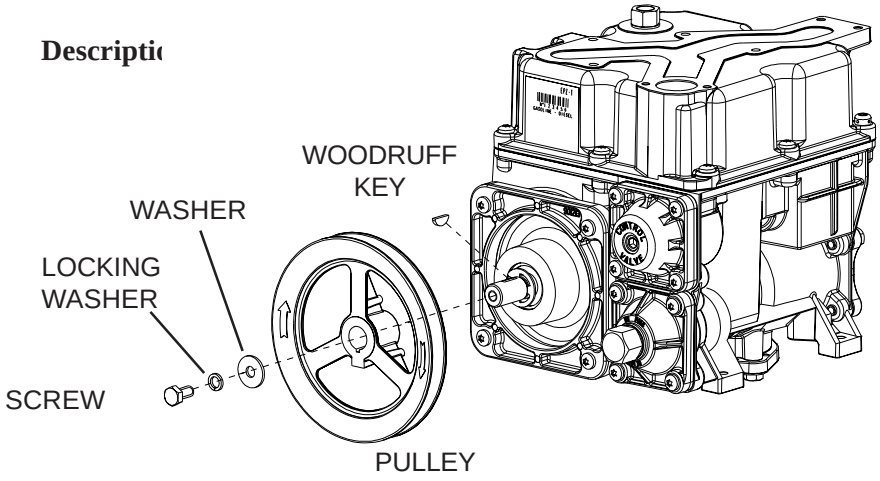
Before starting the maintenance procedure, please refer to section 2.

The pulley is accessed from side A of the dispenser (see section 2.3 for the identification of the dispenser sides).

Tools required

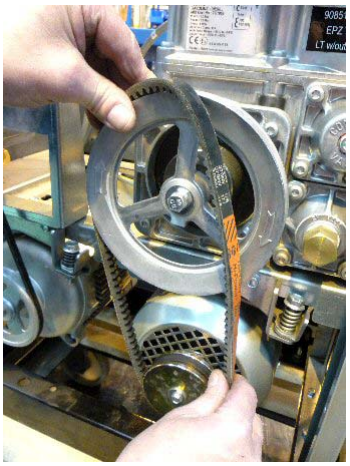
- Replacement pulley (refer to the Parts Manual for exact part identification)
- Puller tool
- 13mm spanner

Descriptio



INSTRUCTIONS

1) Follow the instructions given in section 2.4 to gain access to the hydraulic area.
2) Follow the instructions given in section 4.5 to remove the motor v-belt.
3) Use a 13mm spanner to remove the hex head screw and two washers on the pulley shaft and place in a safe position .
4) If required, use the puller tool to remove the pulley (and woodruff key) from the TQP pump. Pull from the centre part of the pulley only - do NOT apply force with the puller fingers to the outer edges of the pulley.



Note: Do not lose the woodruff key.

5) Fit new pulley to the TQP pump and re-fit the woodruff key.
6) Re-fit the two washers and screw to secure the pulley in position.
7) Re-fit the v-belt and adjust as described in section 4.5.
8) Ensure that all tools and unused materials are removed.
9) Secure the hydraulic door to the dispenser and lock.
10) Re-instate power to the dispenser.
11) Dispose of all waste accordingly.

4.8 Changing the PAS V3 pump

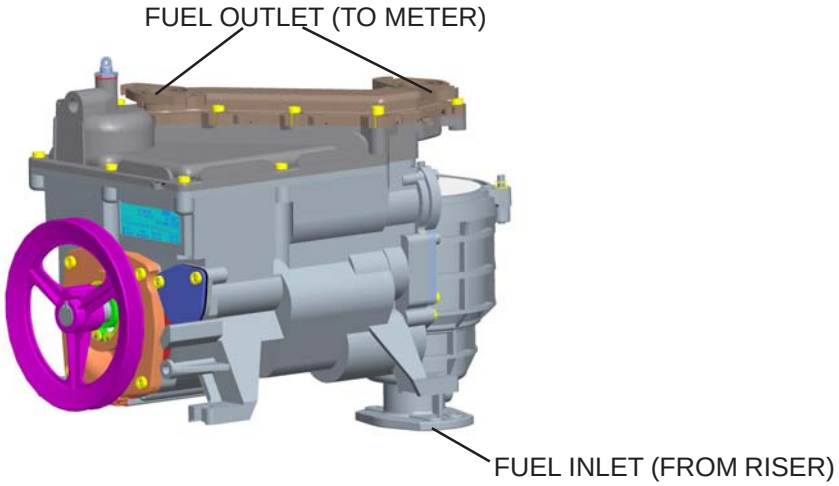
Before starting the maintenance procedure, please refer to section 2.

The pump is accessed from both sides of the dispenser (see section 2.3 for the identification of the dispenser sides).

Tools required

- Replacement pumping unit (refer to the Parts Manual for exact part identification)
- 22mm, 15mm, 13mm and 10mm spanners
- Screwdriver

Description of Parts



INSTRUCTIONS

1) Follow the instructions given in section 2.4 to gain access to the hydraulic area.

2) Identify the pump to be replaced. Locate the associated filter box on side B of the dispenser.

3) Using a 15mm spanner, loosen and remove the two bolts on the flexible connection to the filter box. Remove the gasket. Move the flexible connection clear of the filter box.

WARNING : BEWARE OF FUEL SPILLAGE.

4) Lift the non-return valve on the filter box. Drain the fuel in the pumping unit into a suitable container.

WARNING : BEWARE OF FUEL SPILLAGE.

5) Follow the instructions given in section 4.5 to remove the v-belt.

6) Using a 13mm spanner, remove the two screws and nuts on the meter connection at the top of the pump to disconnect the fuel outlet pipe.

7) Using a 13mm spanner, loosen and remove the four screws on the motor support bracket at the bottom of the pump.

8) If vent pipes are fitted as an option, use a 22mm spanner to disconnect the bolts on the pump unit and driptray. Remove the vent pipe completely.

9) Pull the motor cabling clear of the filter box.

10) Carefully disconnect the meter(s).

WARNING : BEWARE OF FUEL SPILLAGE.

11) From side B of the dispenser, slide the pump and filter box out towards the filter box end.

Note : ensure the motor cabling is clear of the filter box.

WARNING : BEWARE OF FUEL SPILLAGE DURING THE REMOVAL.

12) Remove the plug/protective hygiene cover on the filter of the new pump.

13) Position the new pump by sliding it into the unit from side B of the dispenser.

Note : ensure the motor cabling is clear of the filter box.

14) Using a 13mm spanner, re-fit the four screws on the support bracket below the pump unit to secure the pump into position.

15) Using a 13mm spanner, re-fit the two screws and nuts on the fuel outlet pipe on top of the pump using new o-rings.

16) Follow the instructions given in section 4.5 to re-fit and adjust the motor v-belt.

17) If removed, re-fit the vent pipes.

18) Using a 15mm spanner, re-fit the flexible connection to the filter box.

19) Ensure that all tools and unused materials are removed.

20) Secure the hydraulic doors to both sides of the dispenser and lock.

21) Re-instate power to the dispenser.

22 Test operation of the new pump.

23) Dispose of all waste accordingly.

4.9 Changing the TQP pump

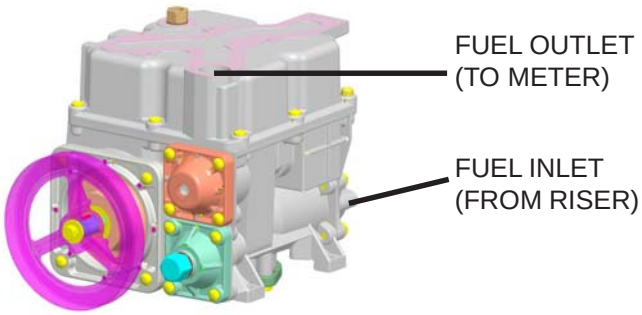
Before starting the maintenance procedure, please refer to section 2.

The pump is accessed from both sides of the dispenser (see section 2.3 for the identification of the dispenser sides).

Tools required

- Replacement pumping unit (refer to the Parts Manual for exact part identification)
- 22mm, 15mm, 13mm and 10mm spanners
- 7mm allen key
- Screwdriver
- Loctite 577 sealant

Description of Parts



INSTRUCTIONS

1) Follow the instructions given in section 2.4 to gain access to the hydraulic area.

2) Identify the pump to be replaced.

3) **TQP PUMPS WITH EXTERNAL FILTER BOX ONLY:-**

- Locate the associated filter box on side B of the dispenser.
- Using a 15mm spanner, loosen and remove the bolts on the flexible connection to the filter box. Remove the gasket. Move the flexible connection clear of the filter box.

WARNING : BEWARE OF FUEL SPILLAGE.

- Lift the non-return valve on the filter box. Drain the fuel in the pumping unit into a suitable container.

WARNING : BEWARE OF FUEL SPILLAGE.

4) **TQP PUMPS WITH INTERNAL FILTER ONLY:-**

- Locate the drain plug on top of the filter flange on the relevant TQP pump.
- Using a 7mm allen key, loosen and remove the drain plug. Drain excess fuel into a suitable container.

WARNING : BEWARE OF FUEL SPILLAGE.

- Using a 13mm spanner, loosen the two screws on the flange on the flexible connection at the back of the TQP pump.
- Disconnect the flange and flexible connection from the TQP pump and move clear of the pump.

WARNING : BEWARE OF FUEL SPILLAGE.

5) Using a 10mm spanner, loosen and remove the two screws on the meter connection at the top of the pump to disconnect the fuel outlet pipe.

WARNING : BEWARE OF FUEL SPILLAGE.

6) If vent pipes are fitted as an option, use a 22mm spanner to disconnect the bolts on the pump unit and driptray. Remove the vent pipe completely.

NOTE : Adjacent motor(s) will need to be lowered into the driptray in order to access the screws fixing the pump to pump support bracket.

7) Follow the instructions given in section 4.5 to remove the v-belt.

8) Carefully lift motor (and bracket) out of the slots in the pump support bracket and lower into driptray taking care not to damage the motor cables.

9) Using a 13mm spanner, loosen and remove the four screws on the pump support bracket below the pump. Carefully remove the four isolation pads and retain for re-fitting.

10) **TQM PUMPS WITH INTERNAL FILTER ONLY**

- From side A of the dispenser, slide the pump out towards the pulley end.
- Remove the pump unit completely.

WARNING : BEWARE OF FUEL SPILLAGE.

11) Remove the plug/protective hygiene cover on the filter on the new pump.

12) Position the new pump by sliding it into the unit from the appropriate side of the dispenser (side A if internal filter or side B if external filter box). Ensure the isolation pads are re-fitted between the pump and bracket.

Note : where applicable, ensure the motor cabling is clear of the filter box.

13) Using a 13mm spanner, re-fit the four screws on the bracket below the pump unit to secure the pump into position.

14) Using a 10mm spanner, re-fit the two screws on the meter connection to the fuel outlet pipe on top of the pump using new o-rings.

15) If lowered, re-fit the motor(s) into the slots on the pump support bracket and tighten the tension screws and locking nuts.

16) Check the alignment of the pulley between the motor and the pump.

17) Follow the instructions given in section 4.5 to re-fit and adjust the motor v-belt.

18) If removed, re-fit the vent pipes.

19) **TQP PUMPS WITH INTERNAL FILTER ONLY:-**

- Using a 7mm allen key, re-fit the drain plug using Loctite 577.
- Using a 13mm spanner, re-fit the screws to secure the flexible connection to the rear of the TQP pump using a new gasket if required.

4.10 Changing the motor

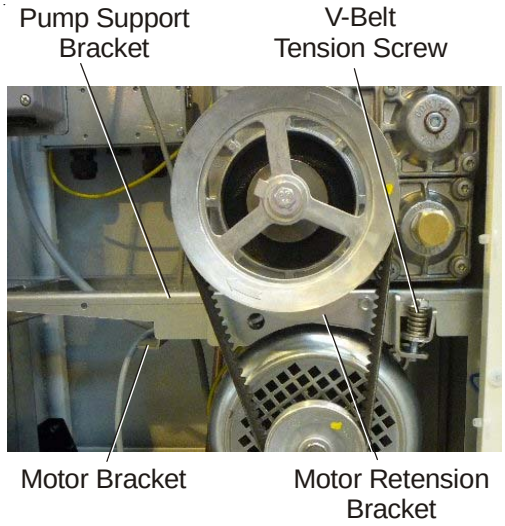
Before starting the maintenance procedure, please refer to section 2.

The motor is accessed from both sides of the dispenser (see section 2.3 for the identification of the dispenser sides) and the cabling requires access to the calculator head.

Tools required

- Replacement motor including cables and bracket (refer to the Parts Manual for exact part identification)
- 10mm, 13mm, 24mm and 32mm spanners
- Small screwdriver
- Wire cutters
- Replacement Weights & Measurements seals

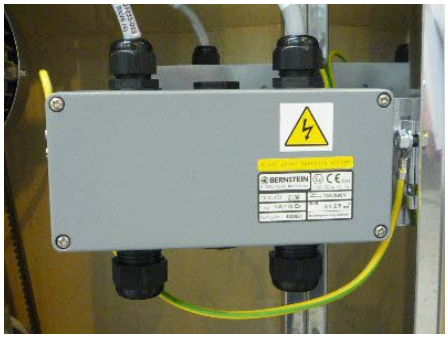
Description of Parts



INSTRUCTIONS

1) Follow the instructions given in sections 2.4 and 2.5 to gain access to the hydraulic area and the cable glands.

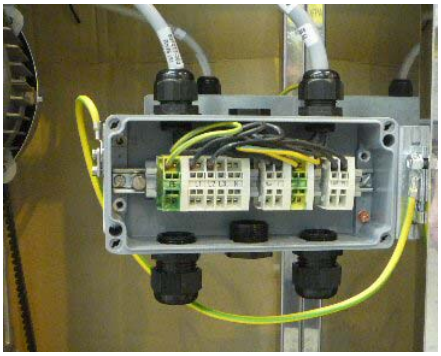
2) Locate the junction box on side B. Using a small screwdriver, rotate the 4 retaining screws holding the cover, until they pop out. Remove the junction box cover completely.



3) Identify the motor to be replaced.

4) From side B of the dispenser, identify the motor power cable and trace to the junction box.

Note : The cable has an identification tag at each end.



5) Loosen the gland in the junction box using a 24mm spanner.

6) Using a small screwdriver, disconnect the motor power cable in the junction box and remove the cable.

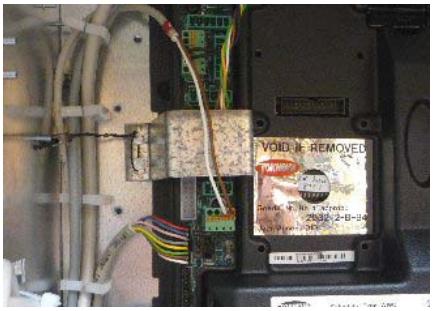
7) Remove the motor power cable from the junction box, and pull the cable through to the motor.

8) Follow the instructions given in section 2.5 to gain access to the calculator head.

9) From side B of the dispenser, identify the motor control cable and trace to the calculator head.

Note : The cable has an identification tag at each end.

10) Cut any cable ties as required using the wire cutters. Remove one side of the foam barrier clamp using a 5mm spanner to uscrew the retaining nuts.



11) If a sealing cover is fitted, break the W&M seal using the wire cutters. Using a screwdriver, loosen and remove the screw on the centre plate cover. Remove the centre plate cover completely to gain access to the motor control connection.

12) Disconnect the motor control cable connection from the mainboard in the calculator head.

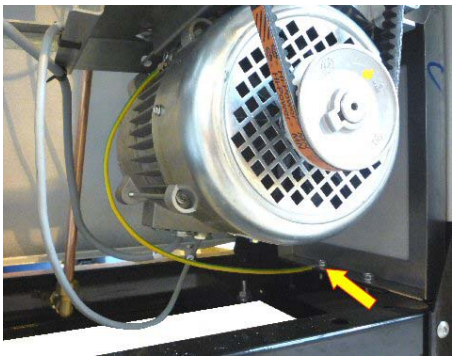
Note : Remember the position of this connection.

13) Using a small screwdriver, remove the connector from the motor control cable.

14) Pull the motor control cable down from the calculator head through the unit to the motor.

15) Using a 10mm spanner, disconnect the motor earth wire.

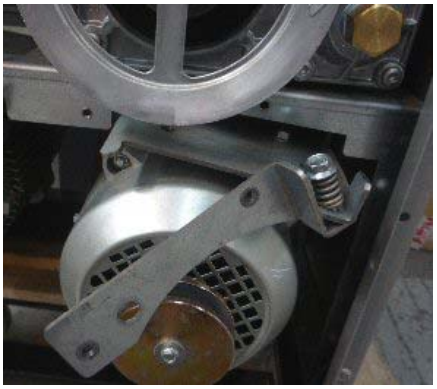
Note : Ensure that the cables are only attached at the motor end.



16) Using a 13mm spanner, unscrew the belt tensioning screw. Do not remove.

17) Unsing a 10mm spanner, remove the 2 screws holding the motor retension bracket.

Remove the v-belt.



18) Support the motor with one hand and carefuly slide it out and clear of the support bracket.

19) Using a 13mm spanner, remove the motor tension bracket from the motor. Remove the four screws on the motor bracket and remove the bracket completely.

20) Re-fit the motor bracket to the new motor. Using a crosshead screwdriver, disconnect the earth wire from the motor and fit to the new motor.

21) From side A of the dispenser, position the motor into the pump support bracket.

22) Replace the motor retension bracket.

23) Follow the instructions given in section 4.5 to re-fit and adjust the motor v-belt.

24) Feed the motor control cable up the unit through the glands and into the calculator head. Replace the foam barrier and clamp.

    Note : Ensure that the cable is routed correctly and contained accordingly.

25) Using a small screwdriver, re-fit the connector to the motor control cable.

26) Re-connect the motor control cable connection to the mainboard in the calculator head.

27) If removed, re-fit the centre plate cover and apply new Weights & Measurements seals.

28) Feed the motor power cable through the dispenser to the junction box.

29) Feed the cable through the gland into the junction box and tighten the relevant gland using a 32mm spanner.

30) Using a small screwdriver, re-connect the motor power cable in the junction box.

31) Using a small screwdriver, re-fit the junction box cover.

32) Ensure that all tools and unused materials are removed.

33) Close the calculator head access door and lock.

34) Re-fit the nozzle panel.

35) Re-fit the hydraulic doors to the dispenser and lock.

36) Re-instate power to the dispenser.

37) Test operation of the new motor and check the direction of the motor rotation is correct.

38) Dispose of all waste accordingly.

4.10.1 MOTOR RELAYS

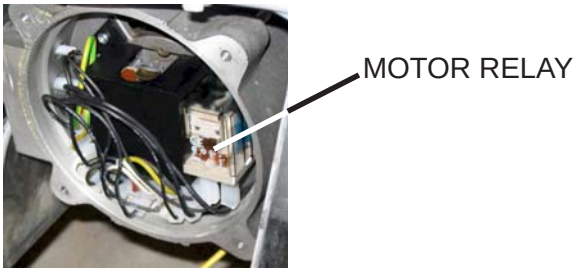
Before starting the maintenance procedure, please refer to section 2.

The motor relays are accessed from side B of the dispenser (see section 2.4 for the identification of the dispenser sides).

Tools required

- Various sized allen keys
- Small magnetic cross head screwdriver
- Cross head screwdriver

Description of Parts



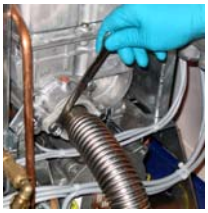
INSTRUCTIONS

1) Follow the instructions given in section 2.4 to gain access to the hydraulic area.

2) **<u>TQP PUMPS ONLY</u>**

- Locate the drain plug on top of the filter flange on the relevant TQP pump.
- Using a 7mm allen key, loosen and remove the drain plug. Drain excess fuel into a suitable container.

WARNING : BEWARE OF FUEL SPILLAGE.



- Using a 13mm spanner, loosen the two bolts on the flange on the flexible connection at the back of the EPZ pump.
- Disconnect the flange and flexible connection from the EPZ pump.

WARNING : BEWARE OF FUEL SPILLAGE.

3) **<u>PAS V3 PUMPS ONLY</u>**

- Using a 17mm spanner, loosen and remove the bolts on the flexible connection to the filter box. Remove the gasket. Move the flexible connection clear of the filter box.

WARNING : BEWARE OF FUEL SPILLAGE.

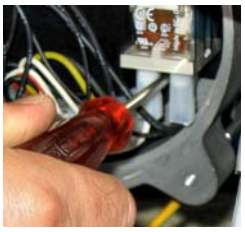
- Lift the non-return valve on the filter box. Drain the fuel in the pumping unit into a suitable container.

WARNING : BEWARE OF FUEL SPILLAGE.

4) Locate the rear cover of the motor. Use an allen key to loosen and remove the four hex head screws on the rear cover.

5) Remove the rear cover completely and place in a safe position.

6) Use a magnetic cross head screwdriver to loosen and remove the top mounting screw above the motor relay.



7) Use a cross head screwdriver to loosen the bottom mounting screw below the motor relay.

Note: Do not remove this screw.

8) Remove the connectors from the motor relay and re-fit to the new relay.

9) Position the new motor relay, re-fit the top mounting screw and tighten the bottom mounting screws to secure in position.

10) Re-fit the rear cover and use the allen key to tighten the four hex head screws to secure in position.

WARNING: ENSURE THE RELAY WIRES ARE CLEAR PRIOR TO RE-FITTING THE REAR COVER. IF REQUIRED, PUSH THE WIRES BACK INTO THE MOTOR.

11) Ensure that all tools and unused materials are removed.

12) Secure the hydraulic door to the dispenser and lock.

13) Re-instate power to the dispenser.

14) Dispose of all waste accordingly.

4.10.2 MOTOR CENTRIFUGAL SWITCH (SINGLE PHASE MOTORS ONLY)

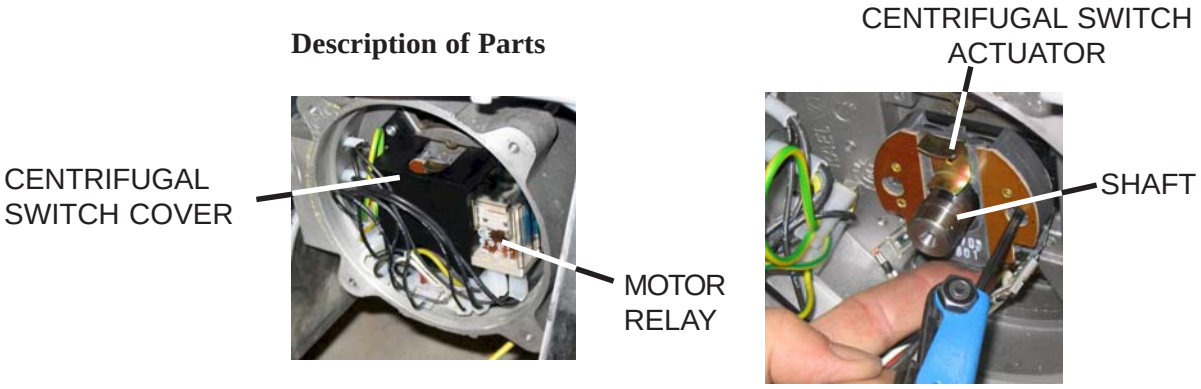
Before starting the maintenance procedure, please refer to section 2.

The centrifugal switch is accessed from side B of the dispenser (see section 2.4 for the identification of the dispenser sides).

Tools required

- Various sized allen keys
- Small magnetic cross head screwdriver
- Cross head screwdriver

Description of Parts



INSTRUCTIONS

1) Follow the instructions given in section 2.4 to gain access to the hydraulic area.

2) Follow instructions in section 4.10.1 to remove the motor relay from the centrifugal switch cover.

3) Disconnect the furthest left spade from the terminal rail.

4) Use a magnetic cross head screwdriver to loosen and remove the two screws on the terminal rail. Move the terminal rail clear of the centrifugal switch cover.

5) Use the magnetic cross head screwdriver to loosen and remove the remaining two screws on the black plastic centrifugal switch cover.

6) Carefully remove the switch cover completely and place in a safe position.

7) Use a small allen key to loosen the grub screw on the rotating section of the centrifugal switch. Remove the rotating section completely and place in a safe position.

8) Use an alley key to loosen the two screws on the centrifugal switch.

9) Remove the two screws, centrifugal switch and black plastic block.

10) Disconnect the terminals from the centrifugal switch and re-connect to the replacement centrifugal switch.

11) Re-fit the two screws and black plastic block to the new centrifugal switch and secure to the motor.

IMPORTANT : Position the centrifugal switch so that the inner actuator finger is as far away from the shaft as possible.

12) Re-fit the rotating section to the centrifugal switch and secure to the motor by tightening the grub screw.

13) Re-fit the centrifugal switch cover and secure in position by tightening the two short screws.

    Note: Use the shorter screws for the centrifugal switch cover and the longer screws for the terminal rail.

14) Re-fit the two screws onto the terminal rail and secure to the motor.

15) Re-connect the furthest left spade to the terminal rail.

    IMPORTANT: This connector must be re-connected.

16) Re-fit the motor relay and secure in position by tightening the top and bottom mounting screws.

17) Re-fit the rear cover and use the allen key to refit the four hex head screws to secure in position.

WARNING: ENSURE ALL RELAY WIRES ARE CLEAR PRIOR TO RE-FITTING THE REAR COVER. IF REQUIRED, PUSH THE WIRES BACK INTO THE MOTOR.

18) Ensure that all tools and unused materials are removed.

19) Secure the hydraulic door to the dispenser and lock.

20) Re-instate power to the dispenser.

21) Dispose of all waste accordingly.

4.11 Changing the TQM Meter

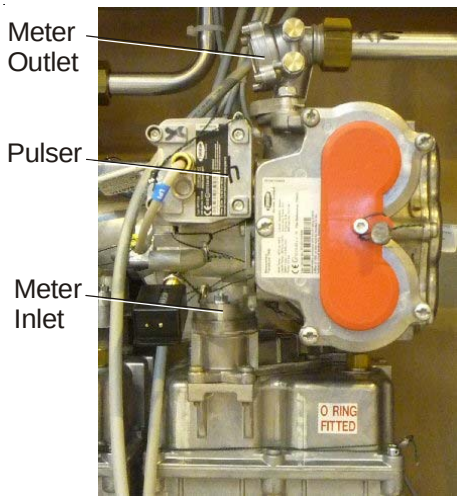
Before starting the maintenance procedure, please refer to section 2.

Identify the relevant side of the dispenser with the meter to be replaced (see section 2.4 for the identification of the dispenser sides).

Tools required

- Replacement meter excluding pulser (refer to the Parts Manual for exact part identification)
- Replacement Weights & Measurements seals
- 10mm and 13mm spanners
- 3mm allen key
- Flat head & cross head screwdriver
- Wire cutters

Description of Parts



INSTRUCTIONS

1) Follow the instructions given in section 2.4 to gain access to the hydraulic area.

2) Use the wirecutters to remove the W&M seals from the meter and pulser.

3) Using a 3mm allen key, loosen and remove the four hex cap screws on the pulser casing. Disconnect the pulser and cable from the pulser casing and move clear of the meter.

4) **TQM PUMPS ONLY**

- Using a 10mm spanner, loosen and remove the two screws on the pump connection at the bottom of the meter to disconnect the meter inlet pipe.
- Disconnect the inlet pipe completely.

WARNING : BEWARE OF FUEL SPILLAGE.

5) **PAS V3 PUMPS ONLY**

- Using a 13mm spanner, loosen and remove the two screws and nuts on the pump connection at the bottom of the meter to disconnect the meter inlet pipe.
- Disconnect the inlet pipe completely.

WARNING : BEWARE OF FUEL SPILLAGE.

6) Using a 13mm spanner, loosen and remove the two screws on the meter outlet pipe at the top of the meter.

7) Disconnect the meter outlet pipe and remove o-ring completely.

WARNING : BEWARE OF FUEL SPILLAGE.

8) Carefully lift the meter out of the dispenser and place in a safe position.

WARNING : BEWARE OF FUEL SPILLAGE.

9) Position the new meter onto the pump and tighten the two screws on the pump connection to secure in position.

10) Re-fit the meter outlet pipe to the top of the meter using new o-rings and secure in position by tightening the two screws

11) Fit the new pulser into the pulser casing.

12) Using a 3mm allen key, re-fit and tighten the four screws on the pulser casing.

13) Apply new W&M seals to the pulser and meter.

14) Ensure that all tools and unused materials are removed.

15) Re-fit the hydraulic doors to the dispenser and lock.

16) Re-instate power to the dispenser.

17) Test operation of the new meter.

18) Dispose of all waste accordingly.

CONTENTS

5 MAINTENANCE PROCEDURES - ELECTRONICS

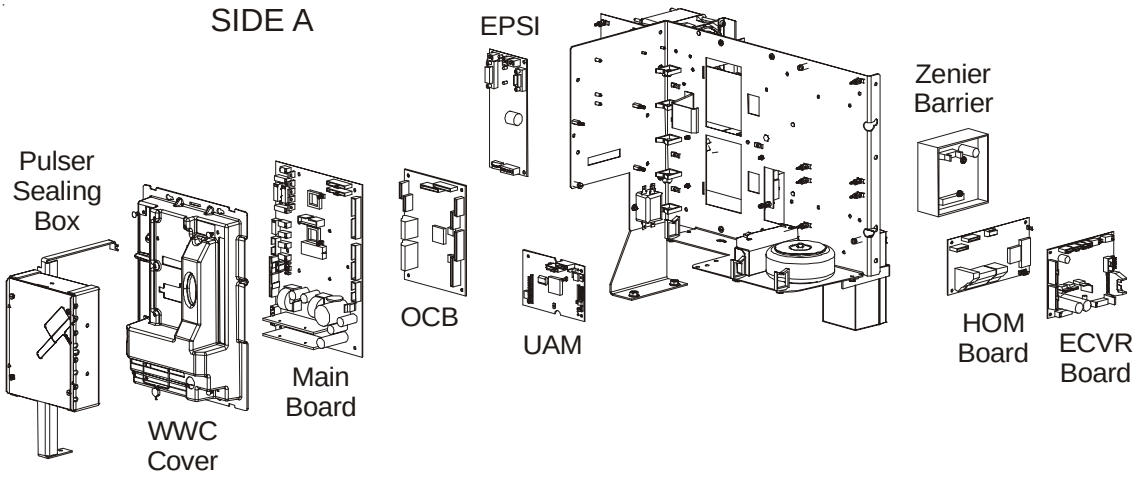
Each side of the dispenser house different electronics depending on the dispenser model and the options ordered.

Note: 4 Active Hose Models have two separate WWCs and therefore the location of the components may be different to what is specified in this section.

5.1 Calculator Head Components

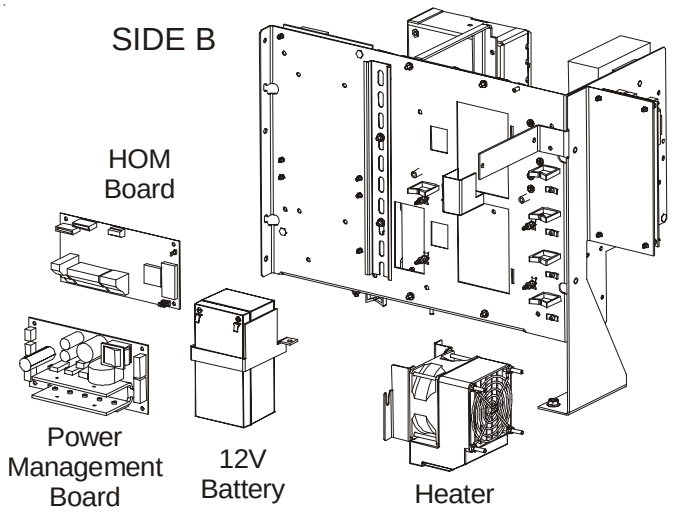
Side A of the dispenser typically houses the following:-

- WWC Mainboard
- Battery & Toroidal Power Transformer



Side B of the dispenser typically houses the following:-

- Hydraulic Option Module (HOM) Board (on side wall of head)
- EPSI Board (optional)
- Sound Option Module (SOM) Board (optional)



5.2 Changing a fuse in the calculator head

Before starting the maintenance procedure, please refer to section 2.

Ensure the dispenser is isolated and all power is turned off.

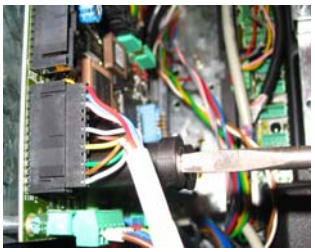
The fuses are accessed from side A of the calculator head (see section 2.3 for the identification of the dispenser sides).

Tools required

- Replacement fuse
- Flathead screwdriver

INSTRUCTIONS

1) Follow the instructions given in section 2.5 for gaining access to the calculator head.
2) Locate the fuse needing replaced (on DIN rail, main board or electronic board).
3) Access the fuse:-
   - **Fuses on the electronic boards only** - using the flathead screwdriver, make a $^{1}/_{4}$ turn anti-clockwise to open the relevant fuse casing to access the fuse.



   - **Fuses on the DIN rails only** - unclip the fuse holder to access fuse.

4) Remove the blown fuse.
5) Fit a new fuse into the casing.

6) Close fuse casing/holder:-
   - **Fuses on the electronic boards only** - using the flathead screwdriver, make a $^{1}/_{4}$ turn clockwise to close the relevant fuse casing.
   - **Fuses on the DIN rails only** - close the fuse holder until it clicks shut.
7) Ensure that all tools and unused materials are removed.
8) Close the calculator head door and lock.
9) Re-instate power to the dispenser and test its operation.
10) Dispose of all waste accordingly.

5.3 Changing the battery pack in the calculator head

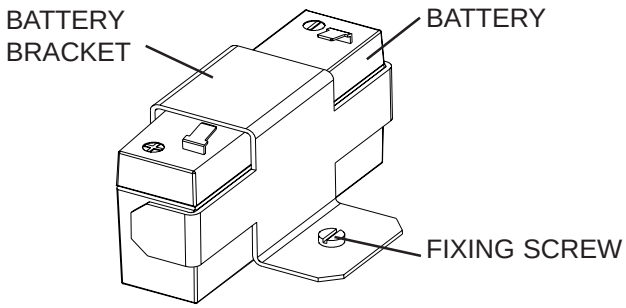
Before starting the maintenance procedure, please refer to section 2.

The battery is accessed from side A of the dispenser (see section 2.3 for the identification of the dispenser sides).

Tools required

- Replacement battery
- 7mm spanner or nut runner

Description of Parts



INSTRUCTIONS

1) Follow the instructions given in section 2.5 to gain access to the calculator head.

2) Locate the battery pack on the bottom of the head.

3) Unplug the two spades connected to the battery.

4) Using a 7mm nut runner, loosen and remove the holding nut on the battery bracket.

5) Remove the battery from the bracket.

6) Fit the new battery into the bracket and re-fit the holding nut.

7) Re-connect the spades to the battery ensuring that the correct connection is made.

Note : Connect the BROWN wire to + terminal on the battery.

8) Ensure that all tools and unused materials are removed.

9) Close the calculator head door and lock.

10) Re-instate power to the dispenser.

11) Dispose of all waste accordingly.

5.4 Changing the MP-T1 Pulser

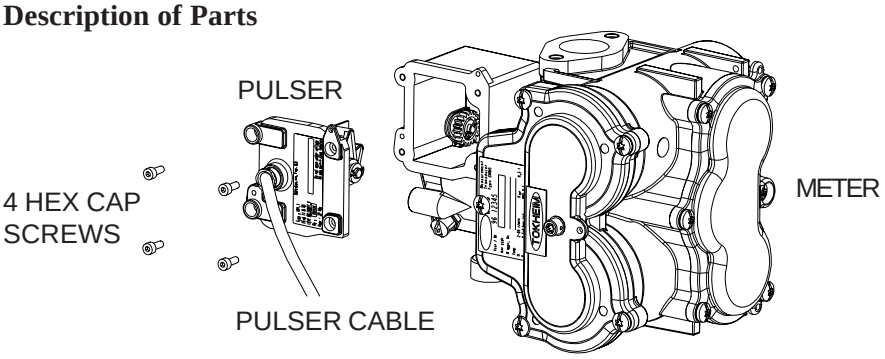
Before starting the maintenance procedure, please refer to section 2.

Identify the relevant side of the dispenser with the pulser to be replaced (see section 2.3 for the identification of the dispenser sides).

Tools required

- Replacement pulser including cable (refer to the Parts Manual for exact part identification)
- Replacement Weights & Measurements seals
- Small flathead screwdriver
- 3mm allen key
- Wirecutters

Description of Parts



INSTRUCTIONS

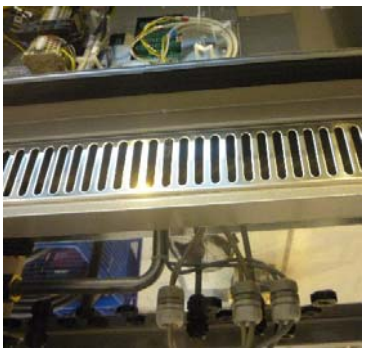
1) Follow the instructions given in section 2.4 to gain access to the hydraulic area.

2) Locate the pulser to be replaced and break the seal using wirecutters. Identify the pulser cable.

   Note : the pulser cable has identification tags at each end.

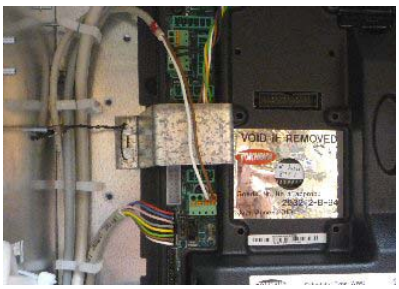
3) Identify the relevant side panel to be removed and follow the instructions given in section 2.4 to gain access to the cable glands.

4) Follow the instructions given in section 2.5 to gain access to the calculator head.



5) Trace the cable up the relevant side of the dispenser to the calculator head. Cut the cable ties using wirecutters and loosen the relevant gland.

6) Locate the pulser cable connection in the calculator head:-



- **HOM Board connection** - break the W&M seals using wirecutters. Using a small screwdriver, loosen and remove screw on HOM board sealing bracket. Locate the pulser cable connection on the HOM board.

- **Mainboard connection** - disconnect all connections on the Comms board and IEB (where fitted). Break the W&M seals on the pulser sealing bracket. Using a small screwdriver, loosen and remove the two screws on the pulser sealing bracket and remove completely. Locate the pulser cable connection on the mainboard.

7) Disconnect the pulser connection completely.

Note : Take care to note the position of this connection on the relevant board.

8) Using a small screwdriver, remove the connector from the pulser cable.

WARNING : NOTE THE ORDER OF THE COLOURED WIRES IN THE CONNECTOR.

9) Pull the pulser cable down from the calculator head, through the unit to the pulser.

10) Using a 3mm allen key, loosen and remove the four bolts on the pulser casing. Remove the pulser and cable from the casing.

11) Fit the new pulser into the pulser casing.

12) Using a 3mm allen key, re-fit and tighten the four bolts on the pulser casing.

13) Feed the cable back up the unit, through the gland and into the calculator head. Replace the cable ties and tighten the relevant gland.

Note : Ensure that the cable is routed correctly and contained accordingly.

14) Where applicable, use a small flathead screwdriver to re-fit the connector to the pulser cable. Re-connect the pulser cable connection to the relevant board in the calculator head.

Note : Refer to the wiring diagram in section 7.

15) If removed, re-fit the centre plate cover.

16) Ensuring that the installation of the pulser is complete and correct, apply new Weights & Measurement seals to the centre plate cover and to the pulser as required.

Note: Qualification for carrying out his task may vary by country.

17) Ensure that all tools and unused materials are removed.
18) Re-fit the side panel to the dispenser.
19) Close the calculator head door and lock.
20) Re-fit the hydraulic door(s) and lock.
21) Re-instate power to the dispenser.
22) Test the operation of the new pulser.
23) Dispose of all waste accordingly.

5.5 Changing a Preset Keypad

Before starting the maintenance procedure, please refer to section 2.

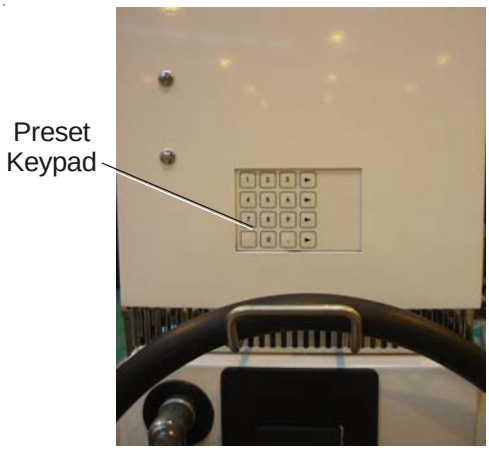
Ensure the dispenser is isolated and all power is turned off.

Identify the relevant side of the dispenser with the keypad to be replaced (see section 2.3 for the identification of the dispenser sides).

Tools required

- Replacement keypad (refer to the Parts Manual for exact part identification)
- 3mm spanner
- Wirecutters

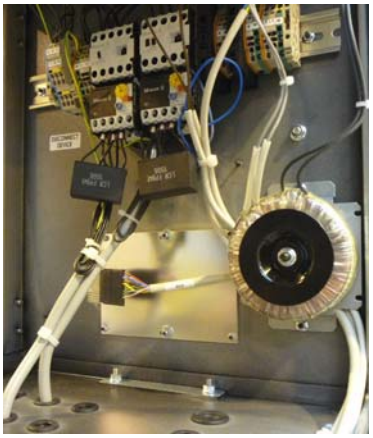
Description of Parts



INSTRUCTIONS

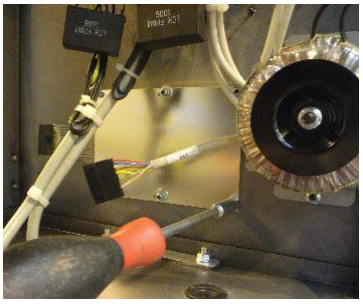
1) Follow the instructions given in section 2.5 to gain access to the calculator head.

2) Locate the relevant keypad to be replaced.



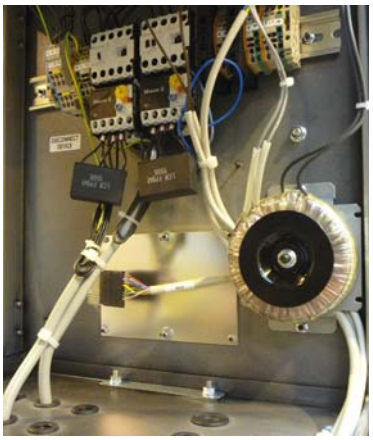
3) Unplug the keypad connector.

   Using the 3mm spanner, unscrew the 6 M3 Nyloc nuts holding the keypad to the calc box and remove the keypad.



4) Fit the new preset keypad onto the studs in the calc box and replace the 6 Nyloc nuts.

   Re-connect the keypad connector.



5) Ensuring all cables are safely inside the calculator head, close the calculator door and lock.
6) Ensure all tools and unused materials are removed.
7) Re-instate power to the dispenser.
8) Test the operation of the preset keypad.
9) Dispose of all waste accordingly.

5.6 Replacing the Mainboard

Before starting the maintenance procedure, please refer to section 2.

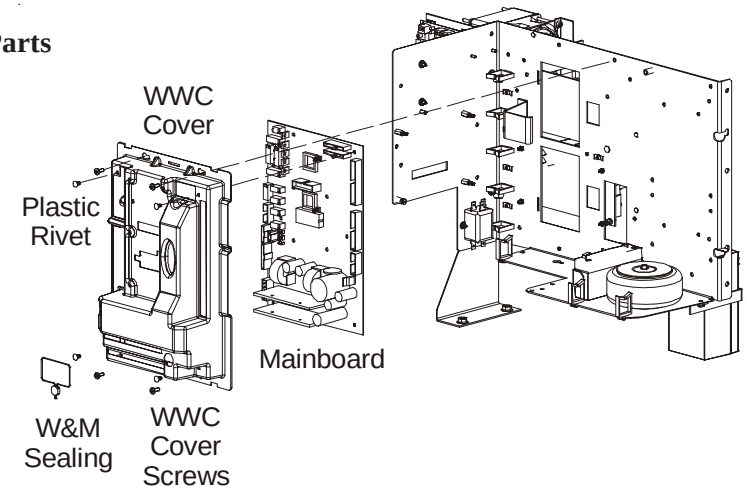
Ensure the dispenser is isolated and all power is turned off.

The Mainboard is accessed from side A of the calculator head (see section 2.3 for the identification of the dispenser sides).

Tools required

- Replacement Mainboard (refer to the Parts Manual for exact part identification)
- Flathead screwdriver
- Crosshead screwdriver
- Replacement W&M seals
- Wirecutters
- Long nose pliers

Description of Parts



INSTRUCTIONS

1) Follow the instructions given in section 2.5 to gain access to the calculator head.
2) Follow the instructions in section 5.9 to remove the Comms Board and IEB (where fitted).
3) **REMOVAL OF WWC COVER ASSEMBLY:-**

- Locate the WWC cover assembly (including Mainboard where fitted) on the WWC centre plate on side A of the dispenser.
- Use wirecutters to cut the W&M seals on the heat sinks on the bottom of the WWC cover.
- Locate the connectors and cables on the WWC cover. Disconnect ALL connectors and cables from the WWC cover.

Note: Take care to note the position of the connector(s) on the WWC cover.

- Use the crosshead screwdriver to loosen the four screws on the WWC cover key slots.
- Carefully remove the WWC cover assembly from the WWC centre plate.

4) **REMOVAL OF MAINBOARD:-**

- Use a flathead screwdriver to loosen and remove the four plastic rivets on the WWC cover to release the mainboard.

- Carefully remove the mainboard from the WWC centre plate cover.

- Position the new mainboard and re-fit the four plastic rivets to secure to the WWC cover.

5) Re-fit the WWC cover assembly (including Mainboard where fitted) to the WWC and secure by tightening the four screws.

6) Re-connect ALL cable and connectors to the WWC mainboard.

7) Re-fit Comms Board and IEB (where fitted) to the WWC cover assembly as described in section 5.9.

8) Re-apply W&M seals to the heat sinks on the bottom of the WWC cover.

9) Ensure that all tools and unused materials are removed.

10) Close the calculator head doors on both sides of the dispenser and lock.

11) Re-instate power to the dispenser.

12) Test the operation of the new board(s).

13) Dispose of all waste accordingly.

5.7 Changing the CSD Board

Before starting the maintenance procedure, please refer to section 2.

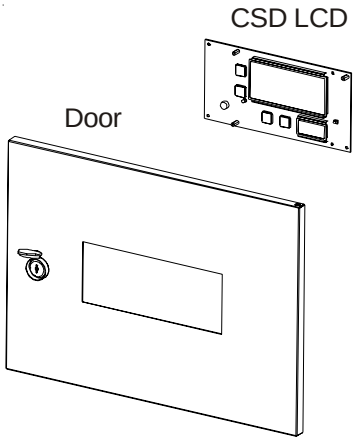
Ensure the dispenser is isolated and all power is turned off.

The Customer Sales Display boards (CSD) are accessed from either side of the calculator head (see section 2.3 for the identification of the dispenser sides).

Tools required

- Replacement CSD board (refer to the Parts Manual for exact part identification)
- 7mm & 5.5mm nut runners
- Replacement W&M seals
- Wirecutters
- Flathead screwdriver

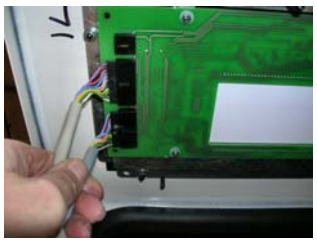
Description of Parts



INSTRUCTIONS

1) **REPLACE CSD BOARD:-**

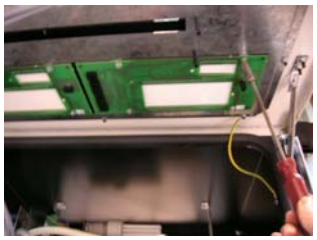
- Disconnect the display cable from the CSD board.



- Disconnect the infrared cable from the CSD board.

- Use a 5.5mm nut runner to loosen and remove the four nuts and washers on the CSD board.
- Remove the CSD board completely.

- Fit the new CSD board to the display bracket and re-fit the four nuts and washers to secure in position.
- Re-connect the display cable and the infrared cable to the CSD board.



2) Ensure that all tools and unused materials are removed.
3) Close the calculator head door and lock.
4) Re-instate power to the dispenser.
5) Test operation of the new board(s).
6) Dispose of all waste accordingly.

5.8 Replacing the Customer Sales Display (CSD) flexi glass and seal

Before starting the maintenance procedure, please refer to section 2.

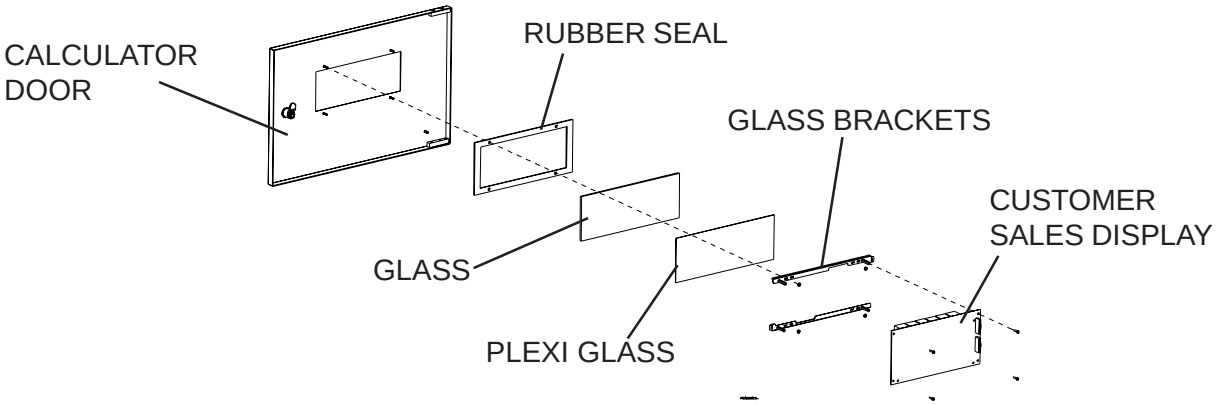
Ensure the dispenser is isolated and all power is turned off.

Identify the relevant side of the dispenser with the CSD to be replaced (see section 2.3 for the identification of the dispenser sides).

Tools required

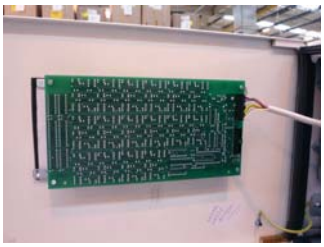
- Replacement Glass or Seal (refer to the Parts Manual for exact part identification)
- Small flat-head screwdriver
- 5.5mm nut runner

Description of Parts

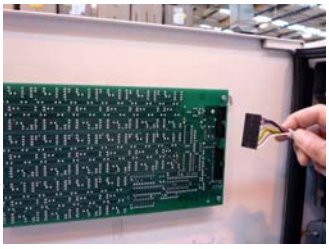


INSTRUCTIONS

1) Follow the instructions given in section 2.5 to gain acccess to the calculator head on the relevant side of the dispenser.



2) Disconnect the display cable from the CSD.

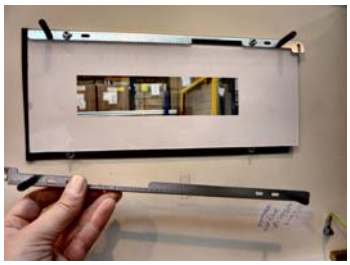


3) Use a flat-head screwdriver to remove the four screws securing the CSD to the glass brackets.

4) Remove the CSD from the glass brackets.

5) Use a 5.5mm nut runner to remove the two nuts securing the bottom glass bracket to the calculator door.

6) Use the 5.5mm nut runner to loosen the two nuts securing the top glass bracket to the calculator door.

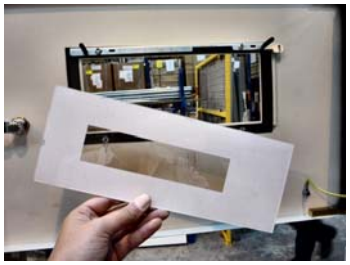


7) Carefully remove the plexi glass.

8) Using the 5.5mm nut runner, remove the two nuts securing the top glass bracket. Remove the bracket.

9) Carefully prise the glass away from the rubber seal and remove.

10) Carefully pull the rubber seal from the calculator door.



11) Fit the new rubber seal to the calculator door.

12) Position the glass and plexi glass on to the door seal.

13) Fit the top and bottom glass brackets and secure using the four nuts.

14) Fit the CSD to the glass brackets and secure using the four screws.

15) Connect the display cable to the CSD.

16) Ensure that all tools and unused materials are removed.

17) Close the calculator head door and lock.

18) Re-instate power to the dispenser.

19) Test the operation of the new board(s).

20) Dispose of all waste accordingly.

5.9 Changing the Comms Board or I/O Extension Board

Before starting the maintenance procedure, please refer to section 2.

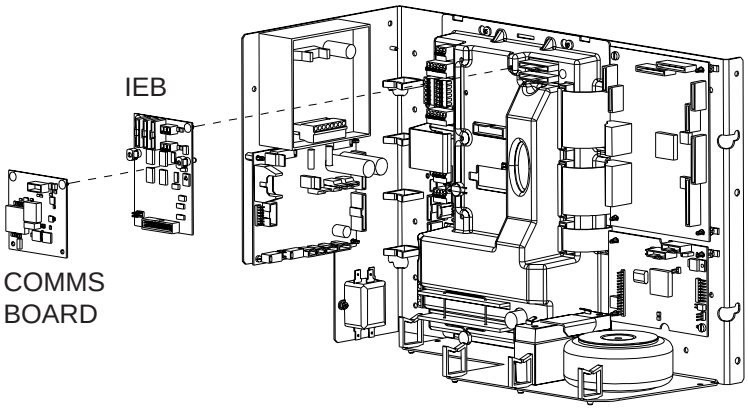
Ensure the dispenser is isolated and all power is turned off.

The Comms Board and I/O Extension Board (IEB) are accessed from side A of the calculator head (see section 2.3 for the identification of the dispenser sides).

Tools required

- Replacement Comms Board or IEB (refer to the Parts Manual for exact part identification)
- Long nose pliers
- Flathead screwdriver

Description of Parts



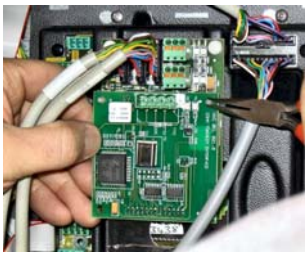
INSTRUCTIONS

1) Follow the instructions given in section 2.5 to gain access to the calculator head on side A of the dispenser.

2) **REPLACE COMMS BOARD:-**

- Locate the Comms Board on the WWC centre plate cover (or IEB where fitted) on side A of the dispenser.
- Locate the connectors on the Comms Board. Disconnect ALL connectors on the board by squeezing the clips and carefully pulling the connector to release.

Note: Take care to note the position of the connector(s) on the Comms Board.



- Use the long nose pliers to carefully squeeze the plastic pillars to release the Comms Board.
- Carefully remove the Comms Board.
- Position new Comms Board onto the plastic pillars on the WWC centre plate cover (or IEB where fitted) using the long nose pliers.

3) **REPLACE IEB:-**

- Remove the Comms Board as described.
- Locate the IEB on the WWC centre plate on side A of the dispenser.
- Locate the connectors on the IEB. Disconnect ALL connectors on the board by squeezing the clips and carefully pulling the connector to release.

Note: Take care to note the position of the connector(s) on the IEB.

- Use a flathead screwdriver to carefully prise off the two plastic rivets on the IEB.
- Carefully remove the IEB.
- Position new IEB onto the WWC Centre plate and use the long nose pliers to re-fit the two plastic rivets to secure.
- Replace Comms Board as described.

4) Ensure that all tools and unused materials are removed.

5) Close the calculator head door and lock.

6) Re-instate power to the dispenser.

7) Test operation of the new board(s).

8) Dispose of all waste accordingly.

5.10 Replacing the HOM Board

Before starting the maintenance procedure, please refer to section 2.

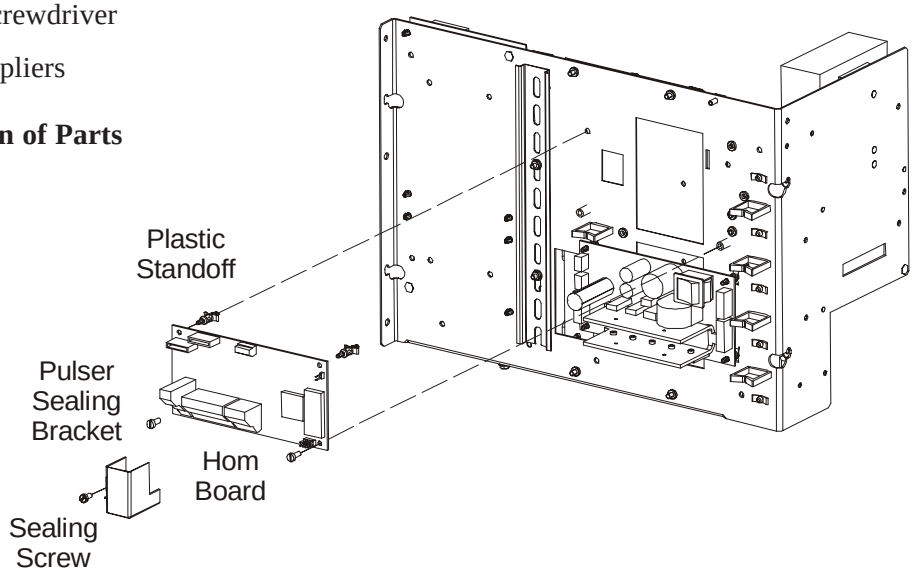
Ensure the dispenser is isolated and all power is turned off.

The Hydraulic Option Module (HOM) Board is accessed from either side of the calculator head (see section 2.3 for the identification of the dispenser sides).

Tools required

- Replacement HOM Board (refer to the Parts Manual for exact part identification)
- Replacement W&M seals
- Flathead screwdriver
- Long nose pliers

Description of Parts



INSTRUCTIONS

1) Follow the instructions given in section 2.5 to gain access to the calculator head side B of the dispenser.

2) Locate the HOM Board on side B of the calculator head (on the RHS facing side B).

3) Use the wirecutters to cut the W&M seals on the sealed pulser connection on the HOM Board.

4) Use a flathead screwdriver to loosen and remove the single screw on the pulser connection sealing bracket. Remove the bracket completely and place in a safe position.

5) Disconnect ALL cables from the HOM board.

Note: Take care to note the position of the cables on the HOM Board.

6) Use the flathead screwdriver to loosen and remove the single screw on the HOM Board.

7) Use the long nose pliers to squeeze the three plastic standoffs to release the HOM Board.
8) Remove the HOM Board completely.

9) Position the new HOM Board onto the plastic standoffs.
10) Re-fit the screw to secure the new HOM Board to the head.
11) Re-connect all cables to the new HOM Board.
12) Re-fit the pulser connection sealing bracket and secure in position using the sealing screw.

13) Re-apply W&M seals to the pulser connection sealing bracket.

    Note: qualification for carrying out this task may vary by country.

14) Ensure that all tools and unused materials are removed.
15) Close the calculator head door and lock.
16) Re-instate power to the dispenser and test its operation.
17) Dispose of all waste accordingly.

5.11 Replacing the Programming Switch

Before starting the maintenance procedure, please refer to section 2.

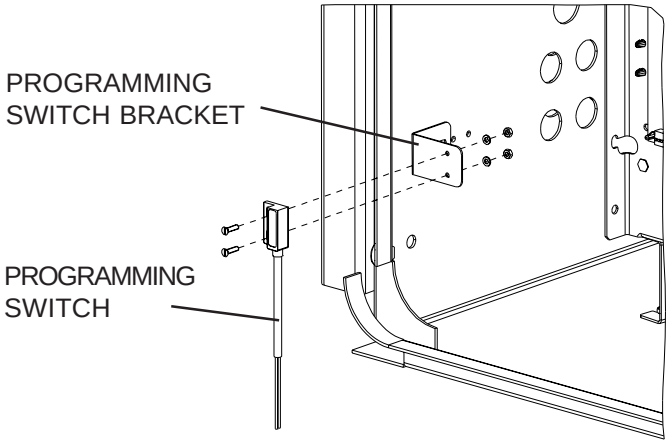
Ensure the dispenser is isolated and all power is turned off.

The Programming Switch is accessed from side B of the calculator head (see section 2.3 for the identification of the dispenser sides).

Tools required

- Replacement Programming Switch (refer to the Parts Manual for exact part identification)
- Small flathead screwdriver
- 5.5mm nut runner

Description of Parts



INSTRUCTIONS

1) Follow the instructions given in section 2.5 to gain access to the calculator head.

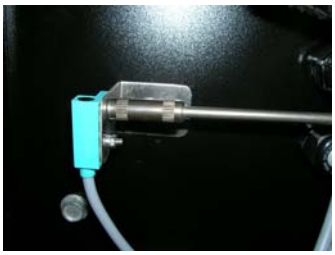
2) Locate the programming switch on side B of the calculator head.

3) Trace the programming switch cable to the mainboard on side A of the dispenser.

4) Disconnect the programming switch connector from the mainboard.

5) Use a small flathead screwdriver to remove the programming switch cable from the connector.

Note: Take care to note the position of the cable wires in the connector.



6) On side B of the dispenser, use a 5.5mm nut runner to remove the two nuts, spring washers and screws securing the programming switch to the programming switch bracket.

7) Remove the programming switch from the dispenser.
8) Secure the new programming switch to the programming switch bracket by re-fitting the two screws, spring washers and nuts.
9) Route the programming switch cable to the mainboard on side A of the dispenser.

10) Use the small flathead screwdriver to connect the programming switch cable to the programming switch connector.
11) Re-attach the connector to the correct position on the mainboard.
12) Ensure that all tools and unused materials are removed.
13) Close the calculator head door and lock.
14) Re-instate power to the dispenser.
15) Test the operation of the new programming switch.
16) Dispose of all waste accordingly.

5.12 Changing the OCB or UAM

Before starting the maintenance procedure, please refer to section 2.

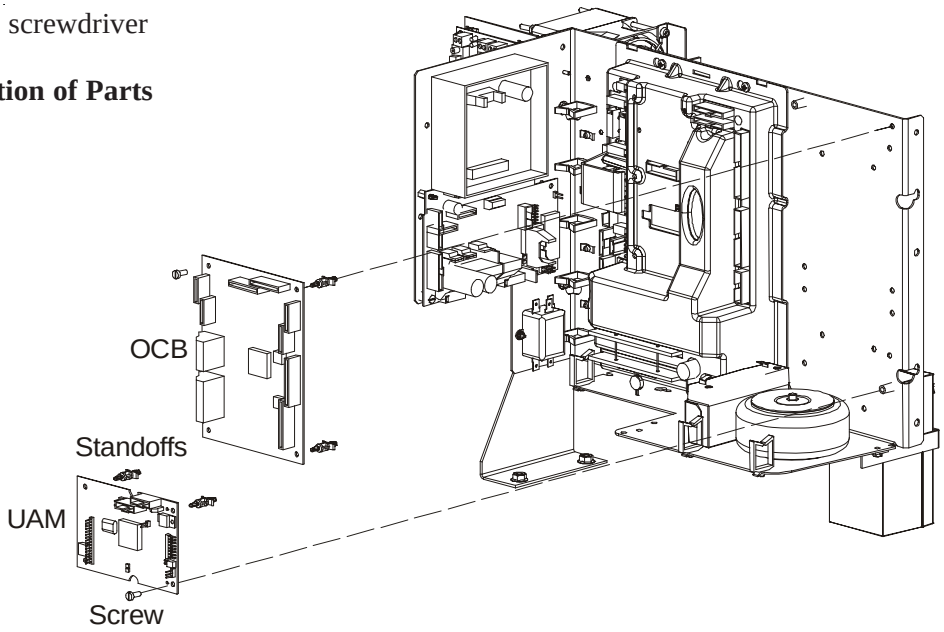
Ensure the dispenser is isolated and all power is turned off.

The Option Controller Board (OCB) and User Access Module (UAM) are accessed from side A of the calculator head (see section 2.3 for the identification of the dispenser sides).

Tools required

- Replacement OCB or UAM (refer to the Parts Manual for exact part identification)
- Long nose pliers
- Flathead screwdriver

Description of Parts



INSTRUCTIONS

1) Follow the instructions given in section 2.5 to gain access to the calculator head on side A of the dispenser.
2) Locate the OCB or UAM on the WWC centre plate on side A of the dispenser.
3) Disconnect all connectors on the OCB or UAM.
4) Use the flathead screwdriver to loosen and remove the screw at the bottom right hand corner of the board.
5) Use the pliers to squeeze together the standoffs in order to release the OCB or UAM from the centre plate.
6) Fit the new OCB or UAM onto the standoffs on the centreplate.
7) Re-fit the screw on the OCB or UAM to secure in position.
8) Replace all connectors on the board.
9) Ensure that all tools and unused materials are removed.
10) Close the calculator head door and lock.
11) Re-instate power to the dispenser and test its operation.
12) Dispose of all waste accordingly.

5.13 Changing the EPSI

Before starting the maintenance procedure, please refer to section 2.

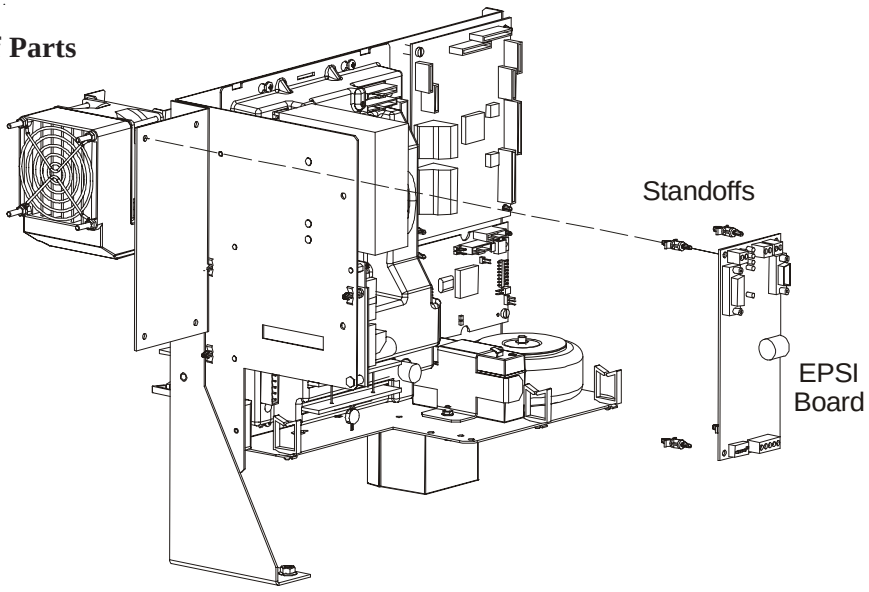
Ensure the dispenser is isolated and all power is turned off.

The EPSI Board are accessed from side A of the calculator head (see section 2.3 for the identification of the dispenser sides).

Tools required

- Replacement EPSI Board (refer to the Parts Manual for exact part identification)
- Long nose pliers

Description of Parts



INSTRUCTIONS

1) Follow the instructions given in section 2.5 to gain access to the calculator head on side A of the dispenser.
2) Locate the EPSI Board on the WWC Centreplate on side A of the dispenser.
3) Disconnect all connectors on the EPSI Board.
4) Use the pliers to squeeze together the standoffs in order to release the EPSI Board from the centreplate.
5) Fit the new EPSI Board onto the standoffs on the centreplate ans secure in position.
6) Replace all connectors on the board.
7) Ensure that all tools and unused materials are removed.
8) Close the calculator head door and lock.
9) Re-instate power to the dispenser and test its operation.
10) Dispose of all waste accordingly.

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CONTENTS

6 MAINTENANCE PROCEDURES - VAPOUR RECOVERY

6.1 Replacing the v-belt on the ECVR Unit

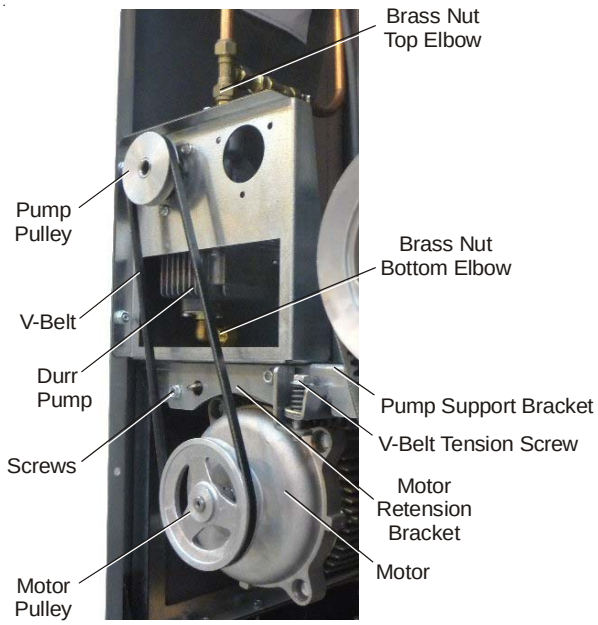
Before starting the maintenance procedure, please refer to section 2.

The V-belt is accessed side A of the dispenser (see section 2.3 for the identification of the dispenser sides).

Tools required

- Replacement v-belt (refer to the Parts Manual for exact part identification)
- 10mm spanner
- 13mm spanner

Description of Parts



INSTRUCTIONS

1) Follow the instructions given in section 2.4 to gain access to the hydraulic area.
2) Locate the ECVR v-belt to be changed.
3) Using a 13mm spanner, loosen the motor V-belt tension screw. Do not remove.
4) Use the 10mm spanner to remove the two screws holding the motor retension bracket.

   Let the bracket drop, resting on the motor.

5) Raise the motor slighty with one hand and remove the v-belt with the other hand.
6) Fit new motor v-belt.
7) Replace the screws holding the motor retension bracket, using the 10mm spanner and tighten.
8) Using the 13mm spanner, tighten the motor v-belt tension screw until the correct tension is achieved.

9) Ensure that all tools and unused materials are removed.
10) Re-fit the hydraulic panel to the dispenser and lock.
11) Re-instate power to the dispenser.
12) Test operation of the new v-belt.
13) Dispose of all waste accordingly.

6.2 Replacing the Durr pump on the ECVR Unit

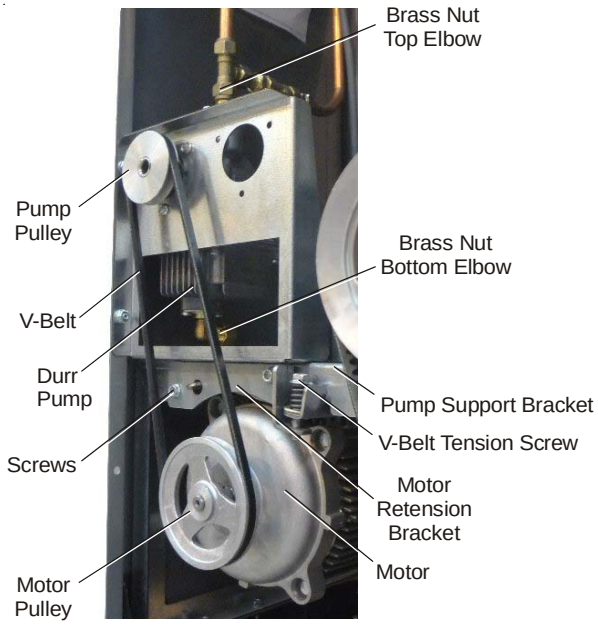
Before starting the maintenance procedure, please refer to section 2.

The pump is accessed from both sides of the dispenser (see section 2.3 for the identification of the dispenser sides).

Tools required

- Replacement pump (refer to the Parts Manual for exact part identification)
- 22mm and 10mm spanners
- 3mm allen key
- Thread Sealant
- 8mm nut runner

Description of Parts



INSTRUCTIONS

1) Follow the instructions given in section 2.4 to gain access to the hydraulic area.

2) Follow the instructions given in section 6.1 to remove the ECVR motor v-belt.

3) Identify the pump to be replaced. Using a 3mm allen key, loosen and remove the relevant pump pulley.

4) Using a 22mm spanner, loosen the brass nut on the elbow at the top of the pump.

5) From side B of the dispenser, use a 22mm spanner to loosen the nut at the opposite end of the copper pipe at the top of the pump.

6) Detach the copper pipe from the top elbow and remove completely.

Note : Retain the copper pipe to re-fit to the new pump.

7) From side B of the dispenser, use a 22m spanner to loosen the brass nut on the elbow at the bottom of the pump.

8) Loosen and detach the flexible pipe from the elbow at the bottom of the pump.

9) From side A of the dispenser, use an 8mm nut runner to remove the three screws behind the pump pulley.

10) Lift out the pump and elbow fittings through the top opening.

11) Position the new pump into the unit.

12) Using the 8mm nut runner, re-fit the three screws to secure the pump into position.

13) From side B of the dispenser, re-connect the flexible pipe to the elbow at the bottom of the pump.

14) Using a 22mm spanner, tighten the brass nut on the elbow at the bottom of the pump.

15) Re-connect the copper pipe to both elbows at the top of the pump.

16) Using a 22mm spanner, tighten the brass nut on the elbow at the top of the pump.

17) From side A of the dispenser, use a 22mm spanner to tighten the brass nut on the elbow at the top of the pump.

18) Apply a little thread sealant to the grub screw and re-fit the pump pulley in position using a 3mm allen key.

19) Re-fit and adjust the v-belt as described in section 6.1.

20) Ensure that all tools and unused materials are removed.

21) Re-fit the hydraulic doors to the dispenser and lock.

22) Re-instate power to the dispenser.

23) Test the operation of the new pump.

24) Dispose of all waste accordingly.

6.3 Replacing the motor on the ECVR Unit

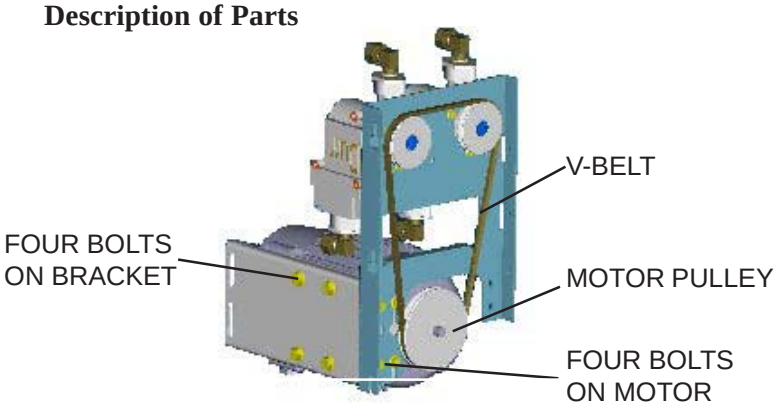
Before starting the maintenance procedure, please refer to section 2.

The motor is accessed from both sides of the dispenser (see section 2.3 for the identification of the dispenser sides).

Tools required

- Replacement motor (refer to the Parts Manual for exact part identification)
- 13mm and 10mm spanners
- 6mm and 2mm allen keys
- Small flathead screwdriver
- Wirecutters

Description of Parts



INSTRUCTIONS

1) Follow the instructions given in section 2.4 to gain access to the hydraulic area.

2) Using a 6mm allen key, loosen and remove the ten bolts on the junction box cover on side B of the dispenser. Remove the junction box cover completely.

3) From side B of the dispenser, identify the motor power cable and trace to the junction box.

Note : the cable has an identification tag at each end.

4) Cut the cable ties using wirecutters and loosen the relevant gland.
5) Using a small flathead screwdriver, disconnect the motor power cable in the junction box.
6) Pull the motor cable through from the junction box to the motor.

7) Identify the relevant side panel to remove to access the motor control cable. Remove the bolts holding the side panel in position. Prise the left side of the panel from the frame, slide the panel towards the right then remove the panel completely.

   Note : there may be a requirement to lift the panel up slightly.

8) Trace the cable up the relevant side of the dispenser to the calculator head. Cut the cable ties using wire cutters and loosen the relevant gland.

   Note : the cable has an identification tag at each end.

9) Follow the instructions given in section 2.5 to gain access to the calculator head. Locate the ECVR circuit board.

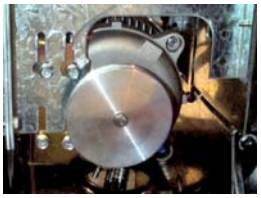
10) Using a small flathead screwdriver, disconnect the motor control cables (positive and negative) from the ECVR circuit board in the calculator head.

11) Pull the motor control cable down from the calculator head, through the unit, to the motor.

    Note : ensure that the cables are only attached at the motor end.

12) Using a 10mm spanner, loosen the four bolts on the motor on side A of the dispenser. The motor will drop down into the slots, held in place by the top two bolts.

    Note : support the motor during this procedure.



13) Follow the instructions given in section 6.1 to remove the ECVR motor v-belt.

14) Push the motor towards side B of the dispenser to release it. Lift out the motor from the unit.

15) Using a 13mm spanner, loosen and remove the four bolts on the motor bracket. Remove the bracket completely.

16) Using a 2mm allen key, loosen and remove the motor pulley.

17) Using a 2mm allen key, fix the motor pulley to the new motor.

18) Using a 13mm spanner, fix the bracket to the new motor.

19) Position the new motor into the unit, locating the four bolts in the slots.

20) Lift up the motor into the raised position and re-fit and adjust the v-belt as described in section 6.1.

    Note : support the motor during this procedure.

21) Feed the motor control cable up the unit, through the gland and into the calculator head. Replace cable ties and tighten the relevant gland.

Note : ensure that the cable is routed and contained accordingly.

22) Using the small screwdriver, re-connect the motor control cables (positive and negative) to the ECVR circuit board.

23) Feed the motor power cable up the unit, through the gland and into the junction box. Replace the cable ties and tighten the relevant gland.

Note : ensure that the cable is routed and contained accordingly.

24) Using the small screwdriver, re-connect the motor power cable in the junction box.

25) Using the 6mm allen key, re-fit the junction box cover.

26) Ensure that all tools and unused materials are removed.

27) Secure the side panel to the dispenser.

28) Close the calculator head door and lock.

29) Re-fit the hydraulic doors to the dispenser and lock.

30) Re-instate power to the dispenser.

31) Test the operation of the new motor.

32) Dispose of all waste accordingly.

6.4 Replacing the solenoid valve on the ECVR Unit

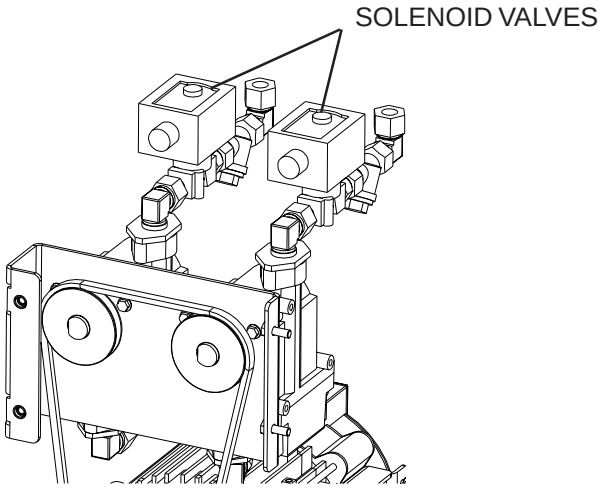
Before starting the maintenance procedure, please refer to section 2.

The solenoid valves are accessed from both sides of the dispenser (see section 2.3 for the identification of the dispenser sides).

Tools required

- Replacement solenoid valve (refer to the Parts Manual for exact part identification)
- 19mm spanner
- Small flathead screwdriver
- Wirecutters

Description of Parts



INSTRUCTIONS

1) Follow instructions given in sections 2.4 and 2.5 to gain access to the hydraulic area, calculator head and cable glands.

2) Locate the solenoid valve to be replaced.

3) Trace the solenoid cable up through the glands to the ECVR Board on side B of the calculator head.

Note : the cable has an identification tag at each end.

4) Remove the relevant connector from the ECVR Board.
5) Using a small flathead screwdriver, disconnect the solenoid cable from the connector.
6) Trace the solenoid cable back to the relevant gland(s). Use wirecutters to remove any cable ties securing the solenoid cable.
7) Using a 19mm spanner, loosen the relevant gland(s).

8) Pull the solenoid cable down through the glands to the ECVR unit.

9) Remove the nut securing the solenoid to the plunger.

10) Lift the solenoid off the plunger and remove from the unit.

11) Place the new solenoid valve onto the plunger and secure in position using the nut.

12) Feed the solenoid cable up through the relevant gland(s) and into the calculator head. Replace the cable ties and tighten the gland(s) securely.

Note : ensure that the cable is routed and contained accordingly.

13) Route the solenoid cable to the ECVR Board.

14) Using the small flathead screwdriver, re-fit the connector to the solenoid cable.

15) Re-connect the connector to the ECVR Board.

16) Ensure that all tools and unused materials are removed.

17) Re-fit the side panel to the dispenser.

18) Close the hydraulic door(s) and lock.

19) Close the calculator head door and lock.

20) Re-instate power to the dispenser.

21) Test the operation of the new solenoid valve.

22) Dispose of all waste accordingly.

6.5 Replacing the VFM Unit

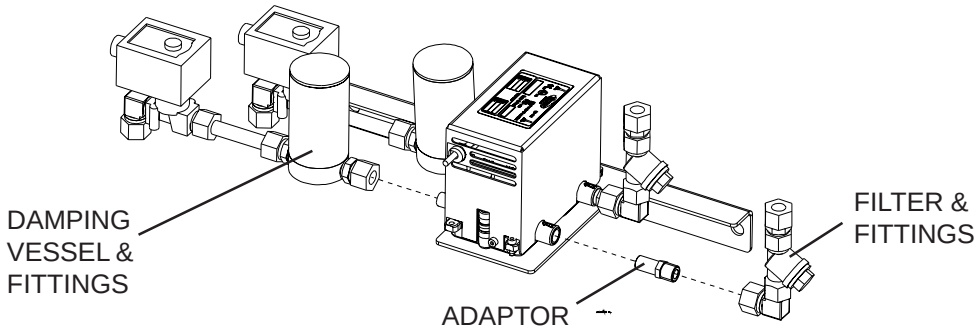
Before starting the maintenance procedure, please refer to section 2.

The VFM unit is accessed from both sides of the dispenser (see section 2.3 for the identification of the dispenser sides).

Tools required

- Replacement VFM unit (refer to the Parts Manual for exact part identification)
- 14mm, 22mm and 24mm spanners
- Small flathead screwdriver
- Wirecutters
- 10mm ratchet

Description of Parts



INSTRUCTIONS

1) Follow instructions given in sections 2.4 and 2.5 and to gain access to the hydraulic area, calculator head and cable glands.

2) Locate theVFM unit to be replaced.

3) Trace the VFM cable up through the glands to the VFM Board on side A of the calculator head.

4) Remove the VFM connector from the VFM Board.

5) Using a small flathead screwdriver, disconnect the VFM cable from the connector.

6) Trace the VFM cable back to the relevant gland(s). Use wire cutters to remove any cable ties securing the VFM cable.

7) Using a 24mm spanner, loosen the relevant gland(s).

8) Free the VFM cable and pull down through the dispenser to the VFM unit.

9) From side A of the dispenser, use a 22mm spanner to loosen the brass nut securing the damping vessel and fittings to the adaptor. Disconnect the vessel and fittings from the adaptor.

WARNING : BEWARE OF FUEL SPILLAGE.

10) Using a 14mm spanner, remove the small adaptor from the VFM unit.

Note : the adaptor is sealed with loctite.

11) From side B of the dispenser, use a 22mm spanner to loosen the brass nut securing the VR filter and fittings to the VFM unit. Disconnect the filter and fittings from the VFM unit.

WARNING : BEWARE OF FUEL SPILLAGE.

12) Use a 10mm ratchet or spanner to remove the four screws at the base of the unit securing the VFM unit to the SCS bracket.

13) Remove the VFM unit from the dispenser.

14) Secure the new VFM unit to the SCS bracket by re-fitting the four screws to the bottom of the VFM unit.

15) From side A of the dispenser, use a 22mm spanner to refit the damping vessel and fittings to the VFM unit.

16) From side B, use a 14mm spanner to fit the adaptor to the new VFM unit. Use loctite to seal the join between the adaptor and the VFM unit.

17) Use a 22mm spanner to re-fit the VR filter and fittings to the adaptor.

18) Feed the new VFM cable up through the relevant glands to the VFM board in the calculator head. Use a 24mm spanner to tighten the glands and replace any cable ties.

19) Use the small screwdriver to attach the VFM cable to the connector.

20) Re-fit the connector onto the VFM board.

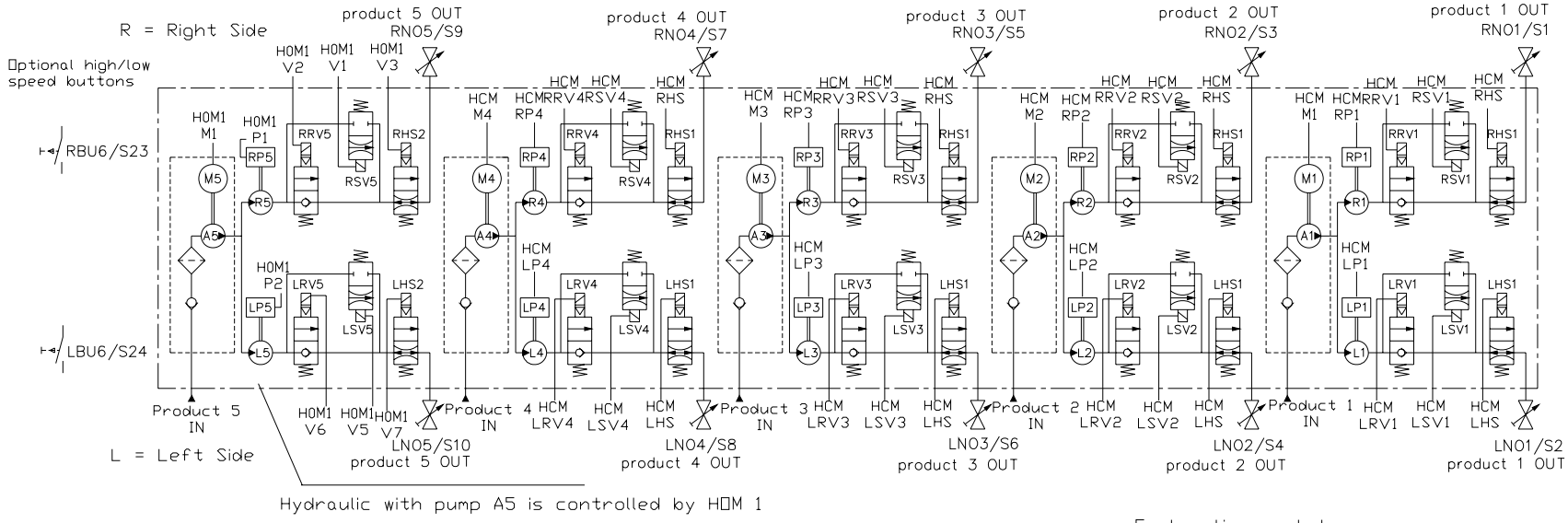
21) Ensure that all tools and unuserd materials are removed.
22) Re-fit the side panel to the dispenser.
23) Close the calculator head door and lock.
24) Re-fit the hydraulic door(s) to the dispenser and lock.
25) Re-instate power to the dispenser.
26) Test the operation of the new VFM unit.
27) Dispose of all waste accordingly.

CONTENTS

7 DRAWINGS

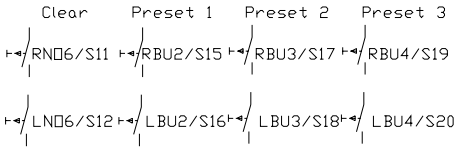
7.1 Hydraulic Set Up 50

7.1.1 Q110 MODELS 1-1, 1-1C, HD 1-1, HD 1-1C & Q200T MODELS 1-1, 1-2, HD 1-1



Explanation abbreviations:
HCM = Connection on I/O Board/Mainboard
RNOx = Right Nozzle switch x (connection on HCM)
LNOx = Left Nozzle switch x (connection on HCM)
RRVx = Right Reduction Valve x
LRVx = Left Reduction Valve x
RSVx = Right Stop Valve x
LSVx = Left Stop Valve x
RHSx = Right Hand Speed valve x
LHSx = Left Hand Speed valve x
Rx = Right volume meter x
Lx = Left volume meter x
RPx = Right Pulser x
LPx = Left Pulser x
HOMx = Hydraulic Option Module x
Mx = Motor product x
Sx = Sensor address x
Ax = Pump x

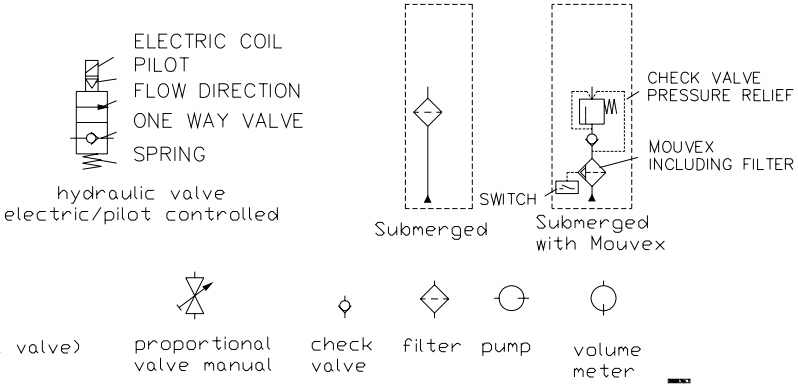
Optional Preset buttons



Remarks:
On HOM one extra HS valve per side
Standard One HS valve per side

Possible flow rate through nozzle (manual valve)
0, 40, 80 and 40/80 litres/minute

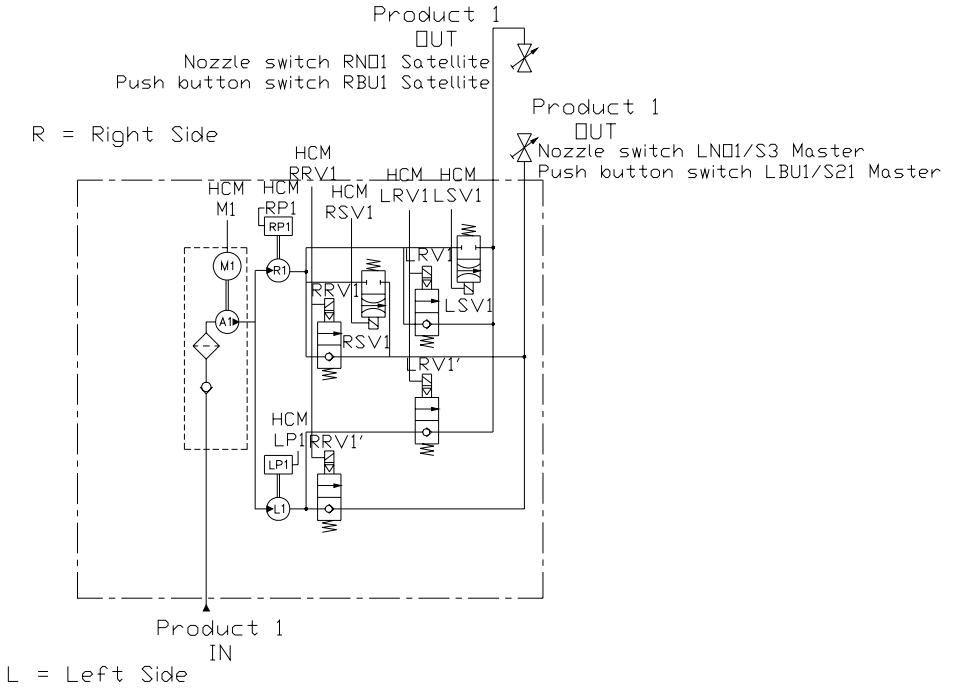
Explanation symbols



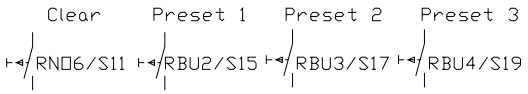
7.2 Hydraulic Set Up 51

7.2.1 Q110 MODELS VHS 1-1, VHS 1-1C & Q210 MODEL VHS 1-1

Explanation abbreviations:
HCM = Connection on I/O Board/Mainboard
RNOx = Right Nozzle switch x (connection on HCM)
LNOx = Left Nozzle switch x (connection on HCM)
RRVx = Right Reduction Valve x
LRVx = Left Reduction Valve x
RSVx = Right Stop Valve x
LSVx = Left Stop Valve x
RHSx = Right Hand Speed valve x
LHSx = Left Hand Speed valve x
Rx = Right volume meter x
Lx = Left volume meter x
RPx = Right Pulser x
LPx = Left Pulser x
HOMx = Hydraulic Option Module x
Mx = Motor product x
Sx = Sensor address x
Ax = Pump x
RBU1 = Right Satellite Slave BUtton
LBU1 = Left Satellite Slave BUtton
RBU5 = Right Satellite Master BUtton
LBU5 = Left Satellite Master BUtton

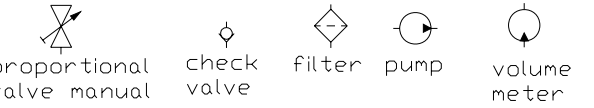


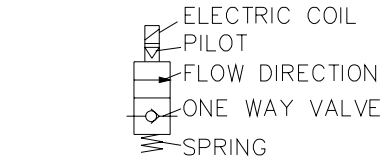
Optional Preset buttons



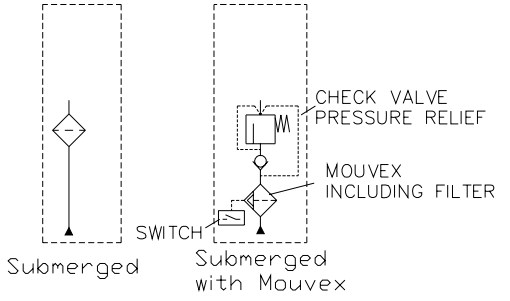
Possible flow rate through nozzle (manual valve) maximum 130 litres/minute

Explanation symbols



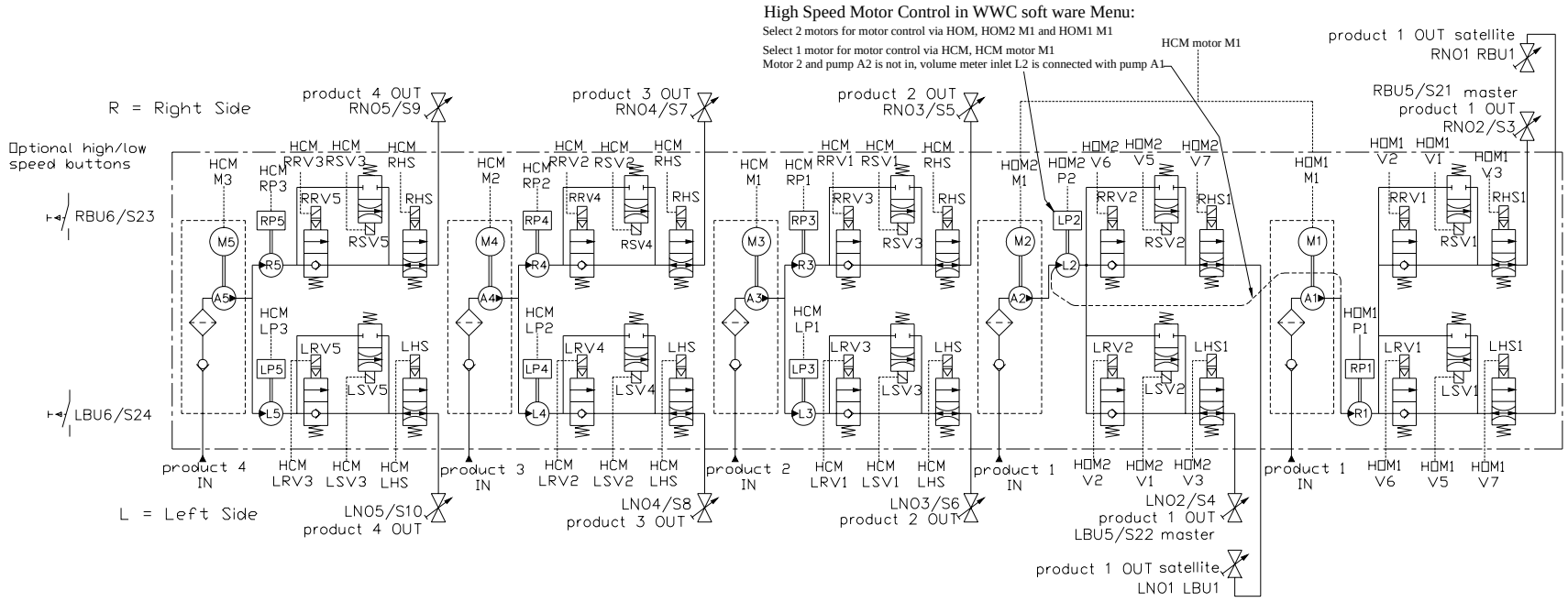


hydraulic valve electric/pilot controlled



7.3 Hydraulic Set Up 53

7.3.1 Q210 MODELS HD1-1, HD1-1P, VHS1-1P, HD2-2, HD2-2D, HD2-2DP, SHD2-2



Explanation abbreviations:
HCM = Connection on I/O Board/Mainboard
RNOx = Right NOzzle switch x (connection on HCM)
LNOx = Left NOzzle switch x (connection on HCM)
RRVx = Right Reduction Valve x
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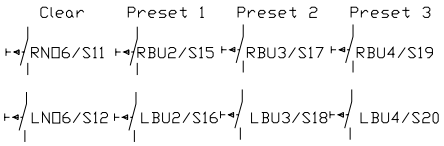
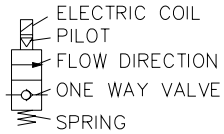
LSVx = Left Stop Valve x
RHSx = Right Hand Speed valve x
LHSx = Left Hand Speed valve x
Rx = Right volume meter x
Lx = Left volume meter x
RPx = Right Pulser x
LPx = Left Pulser x
HOMx = Hydraulic Option Module x
Mx = Motor product x
Sx = Sensor address x
Ax = Pump x
RBU1 = Right Satellite Slave BUtton
LBU1 = Left Satellite Slave BUtton
RBU5 = Right Satellite Master BUtton
LBU5 = Left Satellite Master BUtton

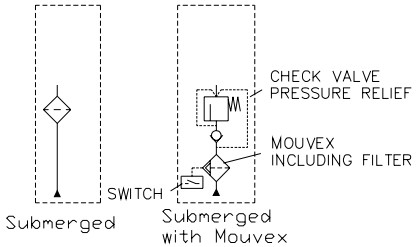
Explanation symbols

Optional Preset buttons



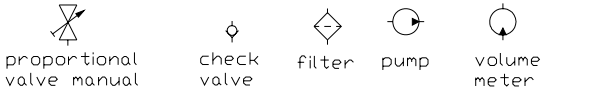


hydraulic valve electric/pilot controlled



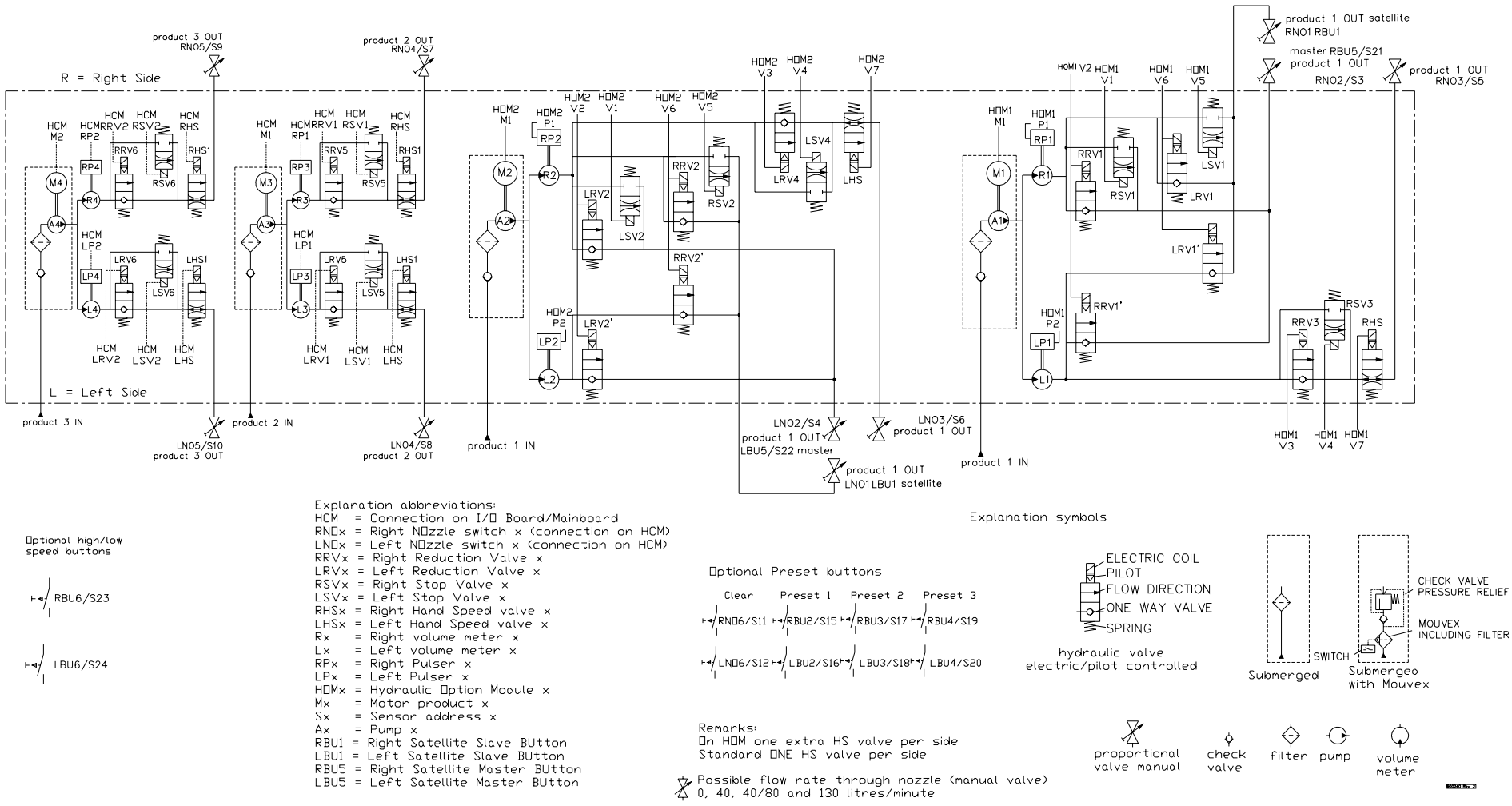
Remarks:
On HOM one extra HS valve per side
Standard ONE HS valve per side

Possible flow rate through nozzle (manual valve)
0, 40, 80 and 40/80 litres/minute



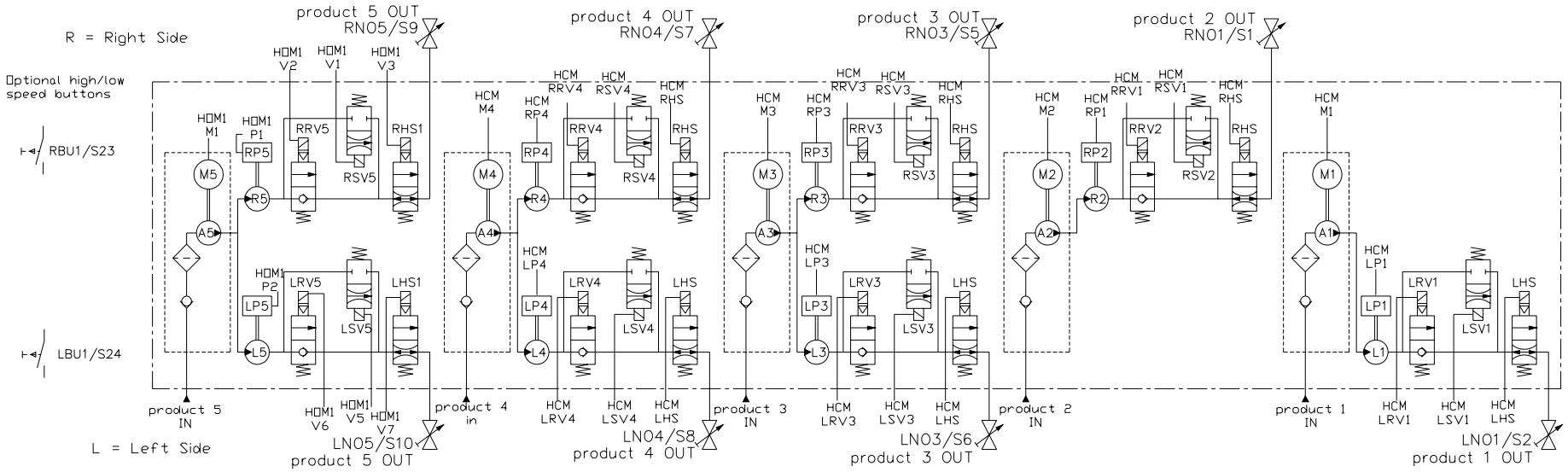
7.4 Hydraulic Set Up 55

7.4.1 Q110 MODEL SVHS 1-2C



7.5 Hydraulic Set Up 58

7.5.1 Q210 MODELS 2-2, 2-2D, HD 2-2, HD 2-2D



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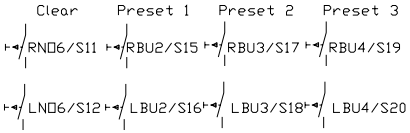
LHSx = Left Hand Speed valve x
Rx = Right volume meter x
Lx = Left volume meter x
RPx = Right Pulser x
LPx = Left Pulser x
HOMx = Hydraulic Option Module x
Mx = Motor product x
Sx = Sensor address x
Ax = Pump x

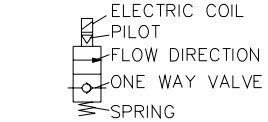
Explanation symbols

Optional Preset buttons

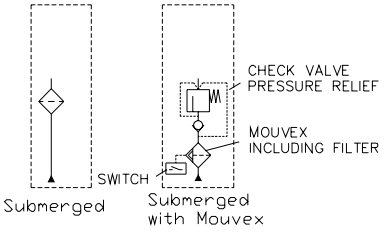


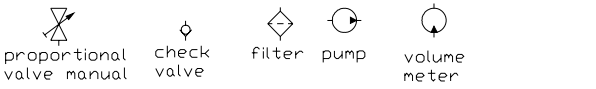
Remarks:
On HOM one extra HS valve per side
Standard ONE HS valve per side

Possible flow rate through nozzle (manual valve)
0, 40, 80 and 40/80 litres/minute



hydraulic valve electric/pilot controlled





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