



# Quantum 410 Installation Manual



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## REVISION RECORD

Date	Revision	Page	Reason
31/08/2006	1	All	Original Issue
20/09/2007	2	Front cover	New photo
20/09/2007	2	3-4	Main Contents revised
20/09/2007	2	1-1,1-7,1-8	New info added for X conditions; certificate no updated
20/09/2007	2	4-1	Section 4 Contents revised
20/09/2007	2	4-3	Section 4.3.1 removed
20/09/2007	2	2-1	Section 2 Contents updated
20/09/2007	2	2-7, 2-10 to 2-12	Model schematics THS 1-2,HS 1-4,VHS 1-2,VHS 1-4,THSM 1-2,VHSM 1-2 revised
20/09/2007	2	2-20 to 2-22	New info added for VR ethanol flame arresters
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	4	5.5.3	Addition of Spin on filter
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	5	2.2.1	Standard speed models. Removal of some models.
	5	2.2.2	Multi prod.with HS models. Removal of some models.
	5	2.2.3	Multi prod.with VHS models. Removal of some models.
	5	2.2.3	Multi prod.with VHS models. Removal of some models.
	5	2.3.1	Change to text on drawing to reflect suction & submerged
	5	3.2.3	Addition of VHS 2-4 drawing
	5	5.4.3	New dispenser earthing photograph
	5	5.6.4	Addition of new outdoor payment terminals and vidium power drawings

Date	Revision	Chapter	Reason
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	7.2	3.1.3	New dimension drawing Q410 LC Standard Head
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	9	2-1	Section 2 Contents updated
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	9	3-1	Section 3 Contents updated
	9	3-6	Section 3.2.3 Ground Frame part numbers table added
	9	5-1	Section 5 Contents updated
	9	5-9	New section added, "Installation of TQP-HS Pumps"
	9	5-12	New section added, "Fitting a Risbridger Check Valve"
	9	5-14	Section 5.6.1 Junction Box Wiring updated
	9	Back Cover	Glossary updated
07/01/2014	9.1	5-3	Q410 LC should only be lifted using forklift slots
	9.1	5-7	5.4.3 Leak plate sealing added
14/04/2015	10	5.6.6	Added section on connecting VR pipes.
27/05/2015	11	5.5.7	Added Installation of New Submerged.
	11	2.5	Added Submerged Connections.

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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 installation and commissioning of the product.

#### **Section 2 - Site Preparation**

This section details the procedures to be carried out in preparation for receipt of equipment at site and the necessary actions prior to installation.

#### **Section 3 - Drawings**

All necessary drawings required for reference during the installation and commissioning are listed and contained in this section.

#### **Section 4 - Packaging and Handling**

This section provides instructions for unpacking and safe handling of the equipment including access to the hydraulic and calculator areas.

#### **Section 5 - Installation**

The instructions for the correct installation of the equipment are contained within this section.

#### **Section 6 - Commissioning**

This section highlights the actions and checks, to be carried out, in preparation for the commissioning activity and the procedures required from commissioning of the equipment to handover.

### **1.2 Product Scope**

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

The Quantum 410 range of fuel dispensers, with the exception of the LPG version. For information on Quantum LPG dispensers refer to the relevant LPG manual as provided by Tokheim.

All dispensers in the Quantum 410 range use the same standard sub-assemblies and offer a wide range of configurations and includes provision for options such as integrated payment terminal, 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

### 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. Some cladding and panels can be extremely light, therefore in windy conditions care must be taken when removing and storing. 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.

#### 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
<b>For more information see User Manual available at this station</b>		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.

Dispensers fitted with a Stage II Vapour Recovery system, are in conformity with the requirements of European Directive 2009/126/EC.

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.

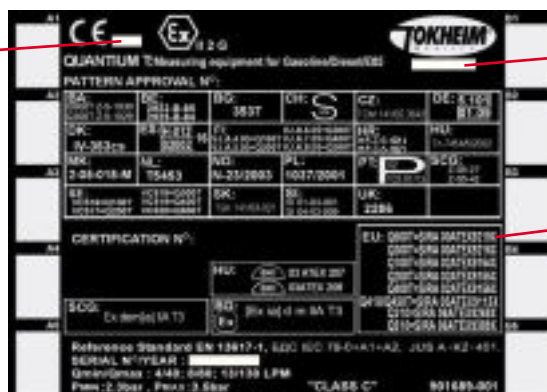
### 1.6.1 DISPENSER MARKING FOR THE ATEX DIRECTIVE

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

“X” CONDITIONS -  
refer to section 1.6.2

### 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

If requested by the site owner a calibration check could be performed as part of the commissioning procedure. (refer to section 6).

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## 2 SITE PREPARATION

### 2.1 General

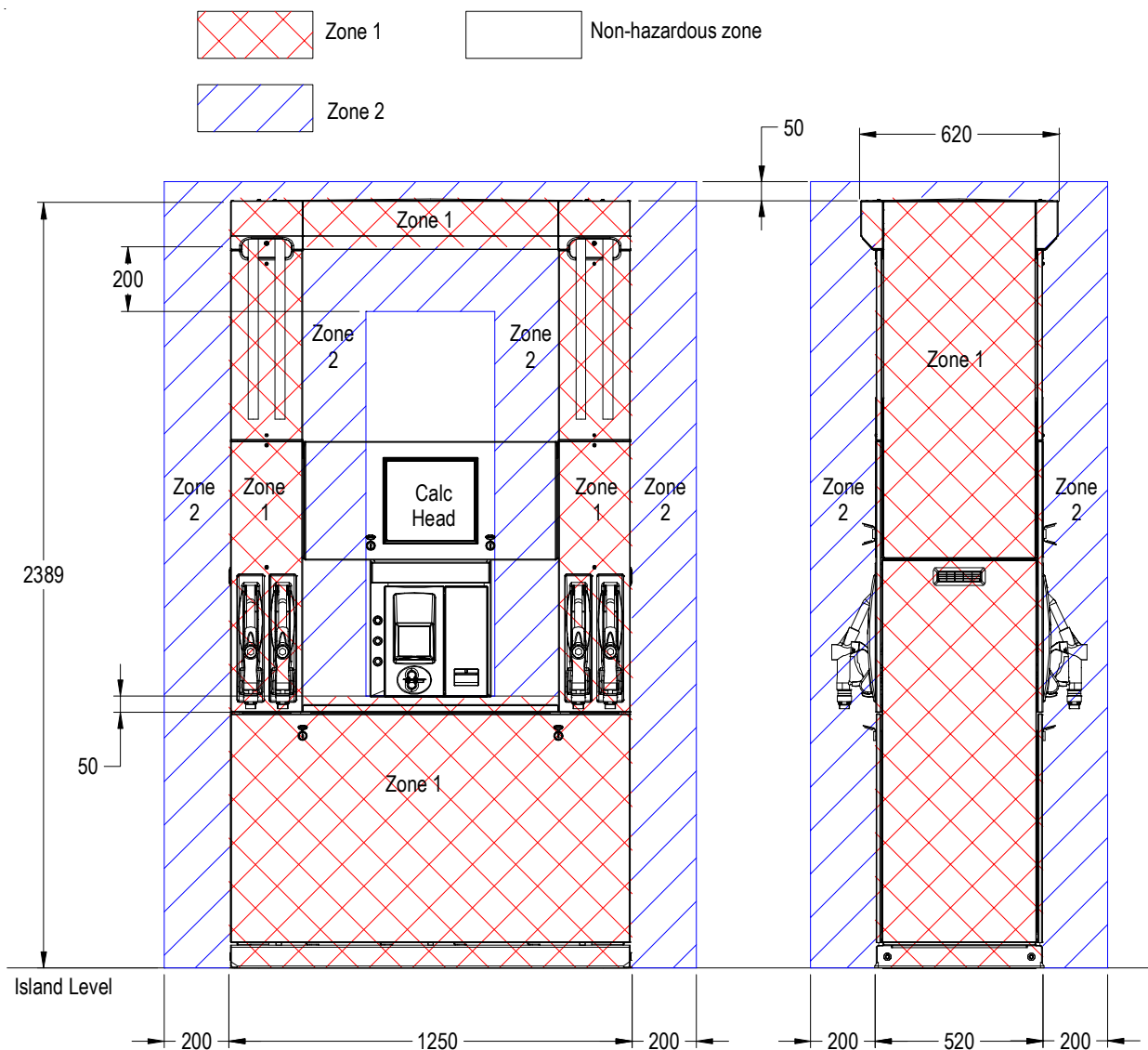
Tokheim dispensers must only be installed on a level island or forecourt surface.

The ground plan will depend on the model ordered. See drawings in Section 3.

#### 2.1.1 ZONING DIAGRAMS

The classification of vapour barriers are indicated in the following diagrams. The zone classifications shown are always the highest applicable to that location within the dispenser.

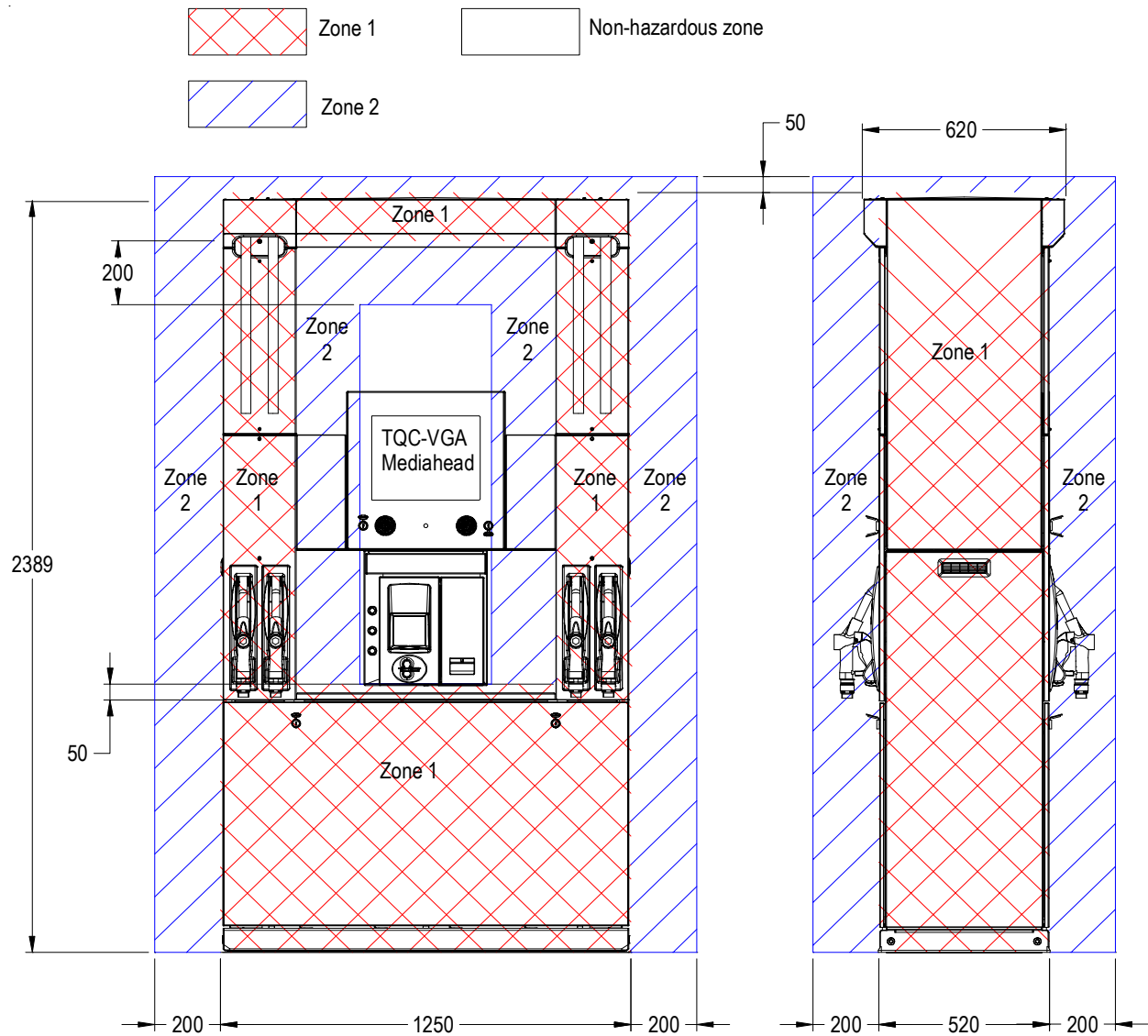
#### Q410 DISPENSER - STANDARD CONFIGURATION



Note:- On this drawing all zone 2 areas are external of the dispenser.  
Zone 1 is internal in the dispenser.

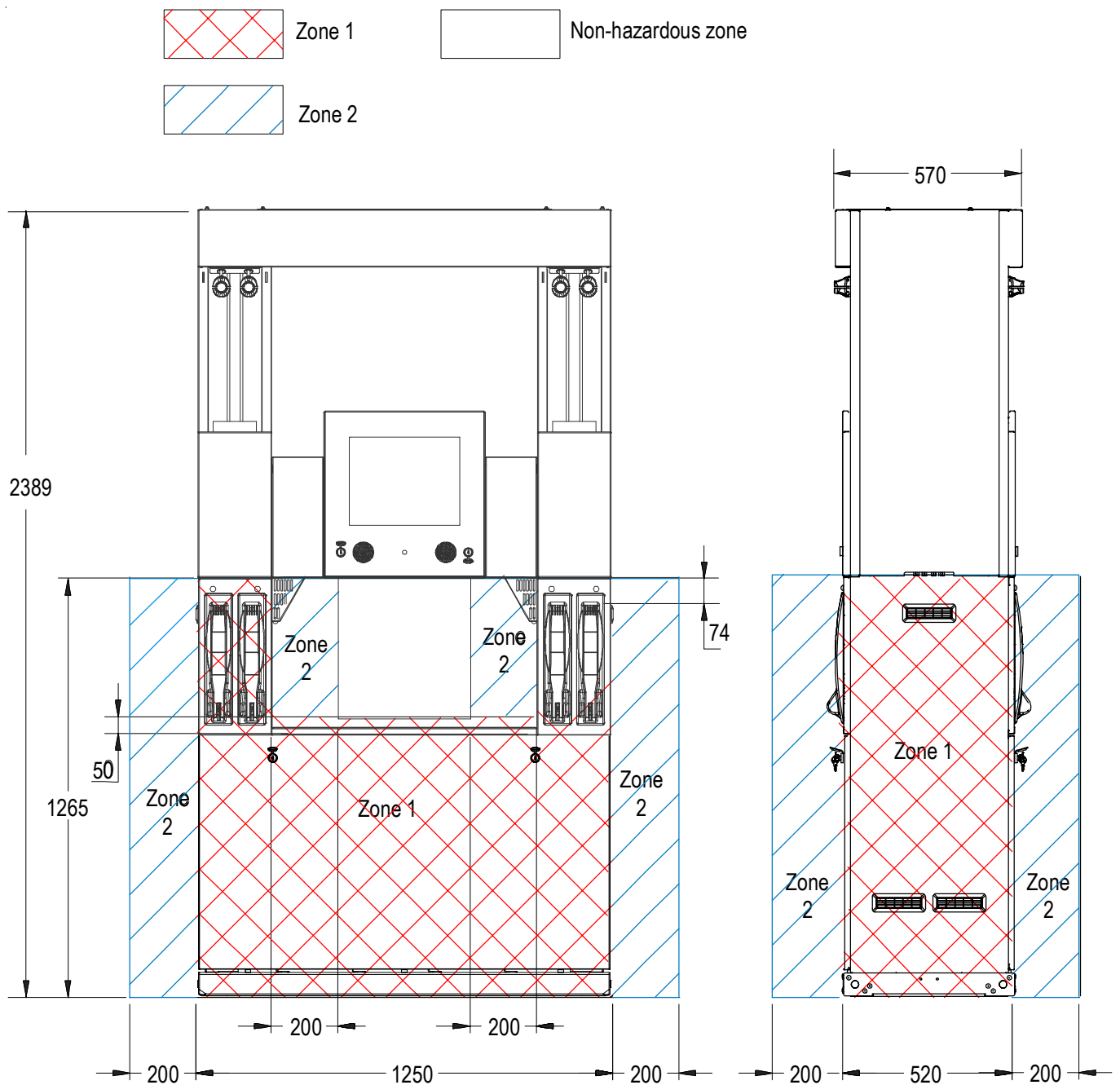


## Q410 DISPENSER - TQC-VGA MEDIA HEAD CONFIGURATION



Note:- On this drawing all zone 2 areas are external of the dispenser.  
Zone 1 is internal in the dispenser.

Q410 LC DISPENSER - STANDARD CONFIGURATION



Note:- On this drawing all zone 2 areas are external of the dispenser.  
Zone 1 is internal in the dispenser.

## 2.2 Basic Model Schematics

### KEY



EPZ (TQP-RS)  
Pump



PAS (TQP-HS)  
Pump



Solenoid Valve



TQM Meter



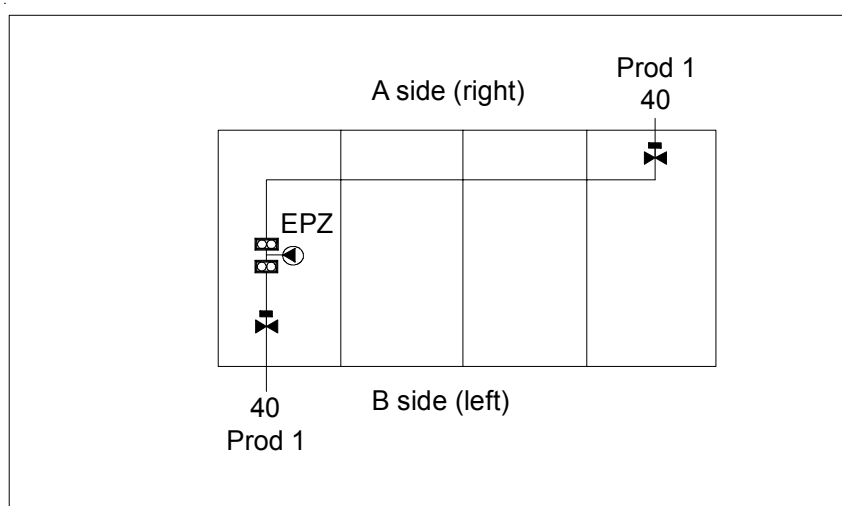
Satellite pipe connection

**Note :** The following schematics are for information purposes only and do not represent the actual positions of the components.

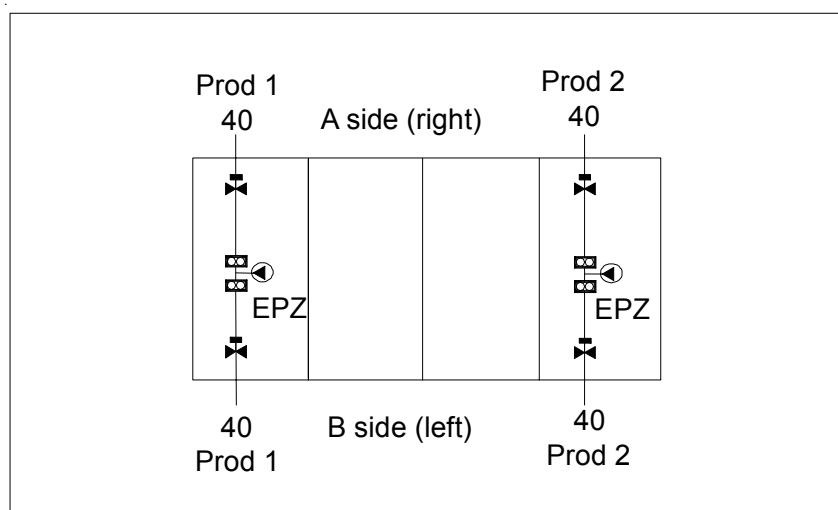
**Note :** The Schematics show configurations where pumping units are fitted.  
For submerged configurations there would be no pumping units.

### 2.2.1 STANDARD SPEED MODELS

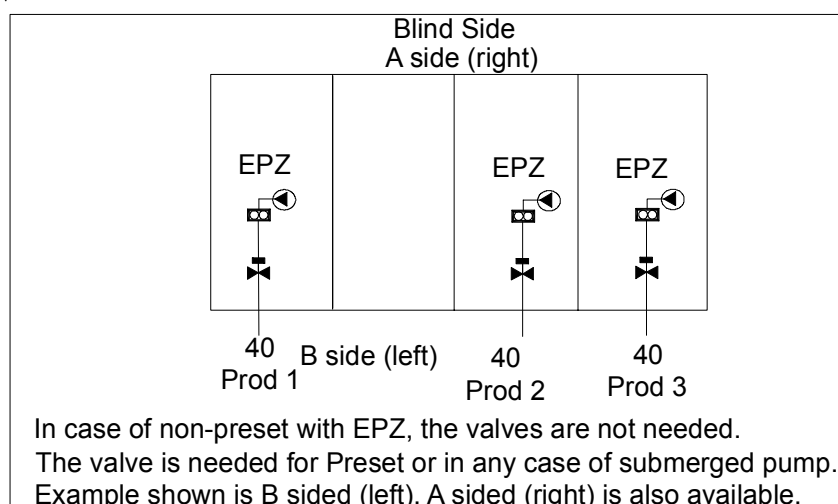
#### Model 1-2



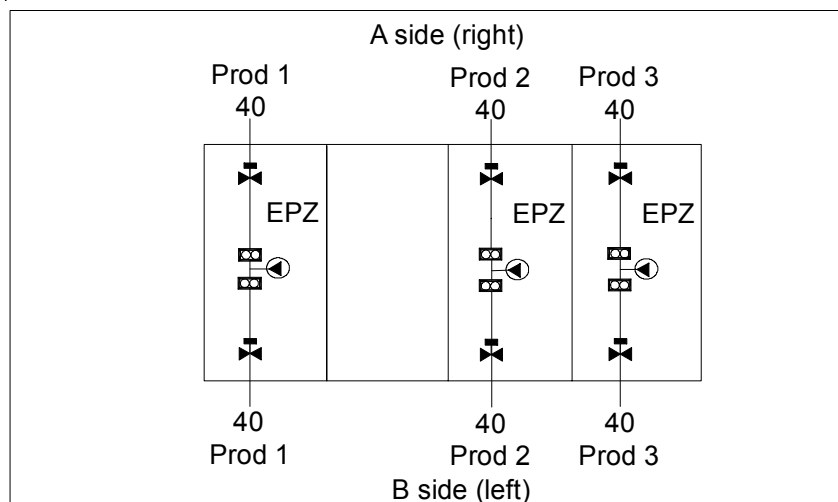
Model 2-4



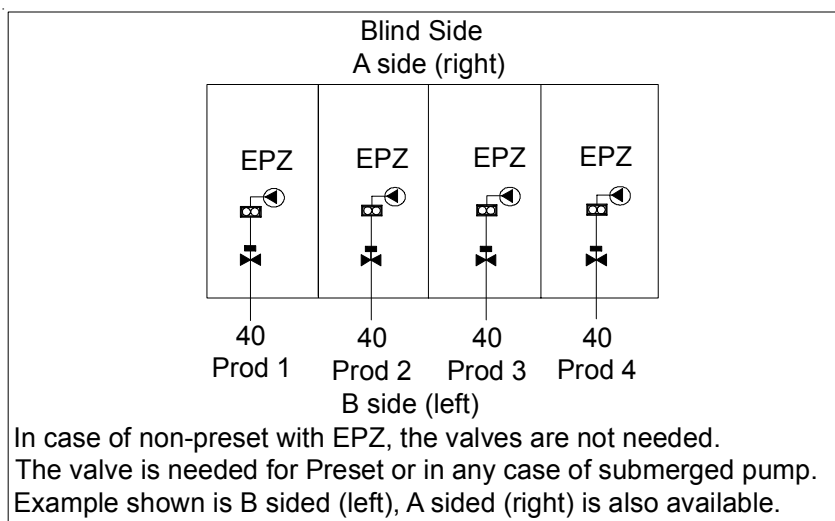
Model 3-3



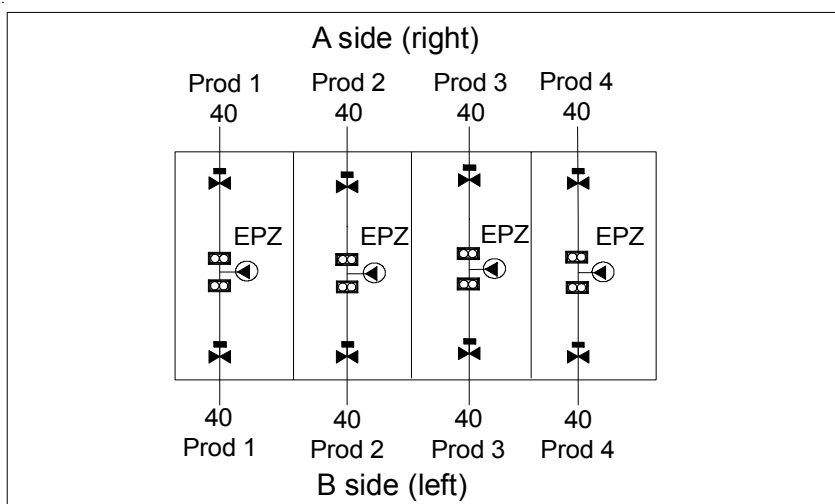
Model 3-6



## Model 4-4

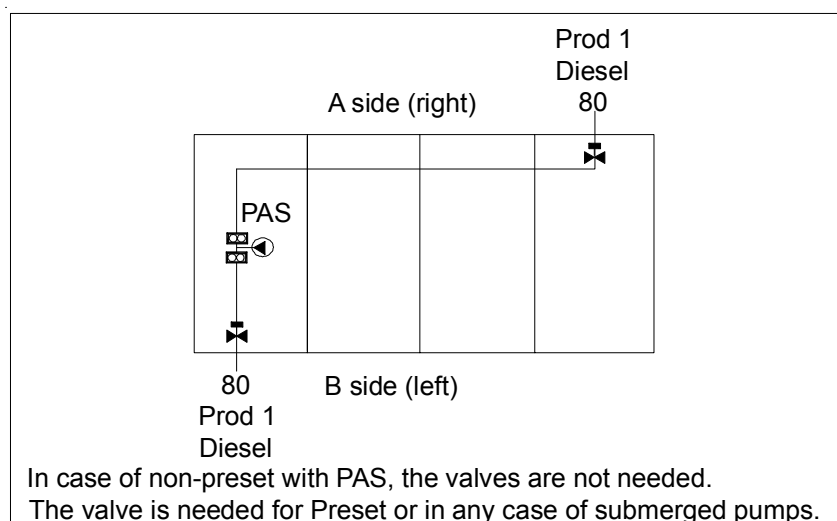


## Model 4-8



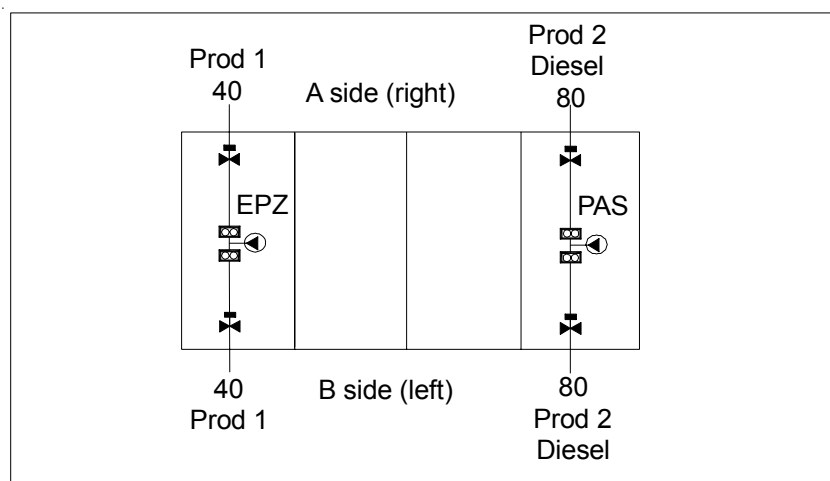
## 2.2.2 MULTI PRODUCT WITH HIGH SPEED DIESEL MODELS

### Model HS 1-2



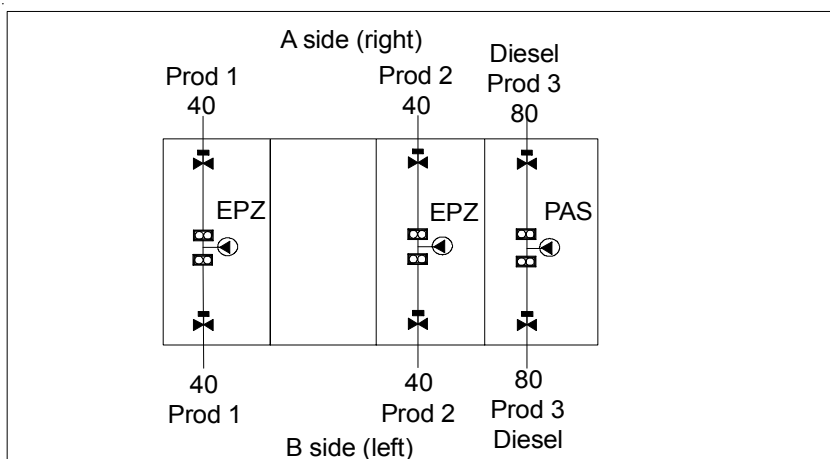
: Option exists to interchange products 1 & 2 (“High speed in first coloumn”)

### Model HS 2-4

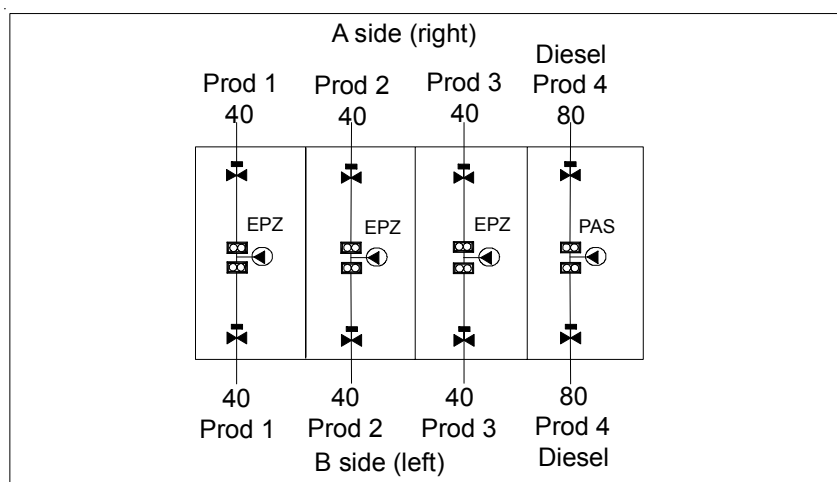


: Option exists to interchange products 1 & 2 (“High speed in first coloumn”)

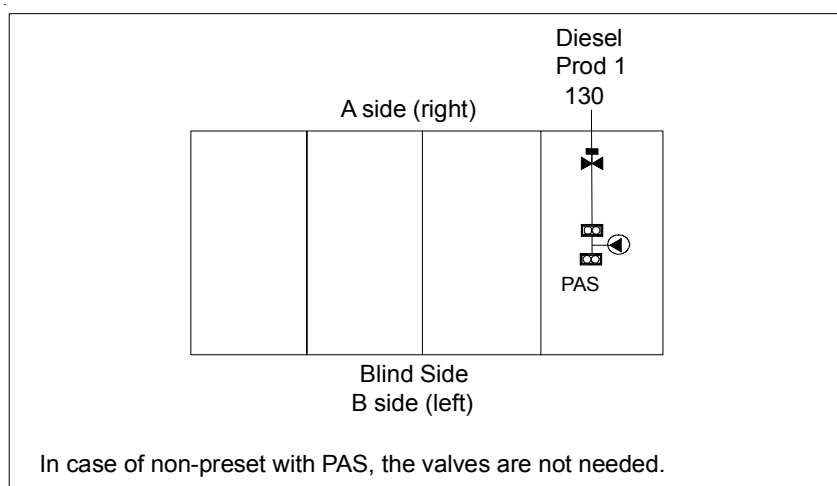
### Model HS 3-6



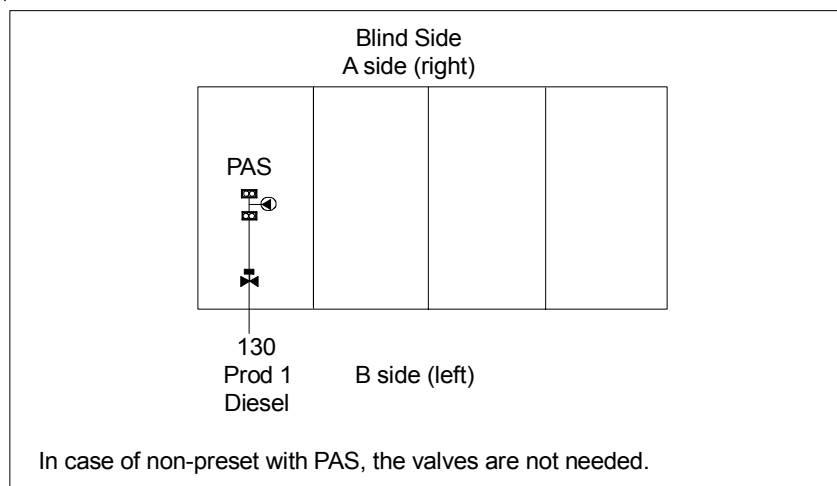
: Option exists to interchange products 1 & 2 (“High speed in first coloumn”)

**Model HS 4-8**

: Option exists to interchange products 1 & 2 (“High speed in first coloumn”)

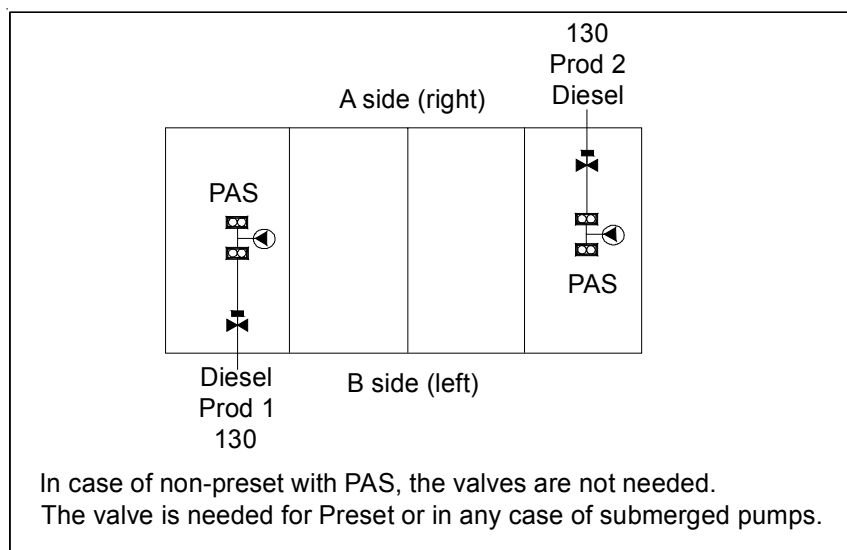
**2.2.3 MULTI PRODUCT WITH VERY HIGH SPEED DIESEL MODELS****Model VHS 1-1 A Side (Right)**

: Option exists to interchange products 1 & 2 (“High speed in first coloumn”)

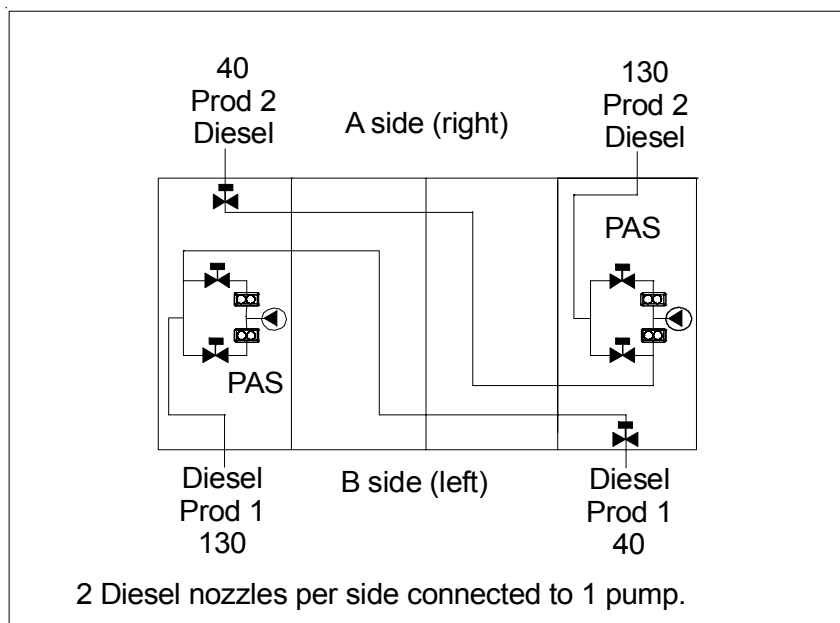
**Model VHS 1-1 B Side (Left)**

: Option exists to interchange products 1 & 2 (“High speed in first coloumn”)

Model VHS 1-2



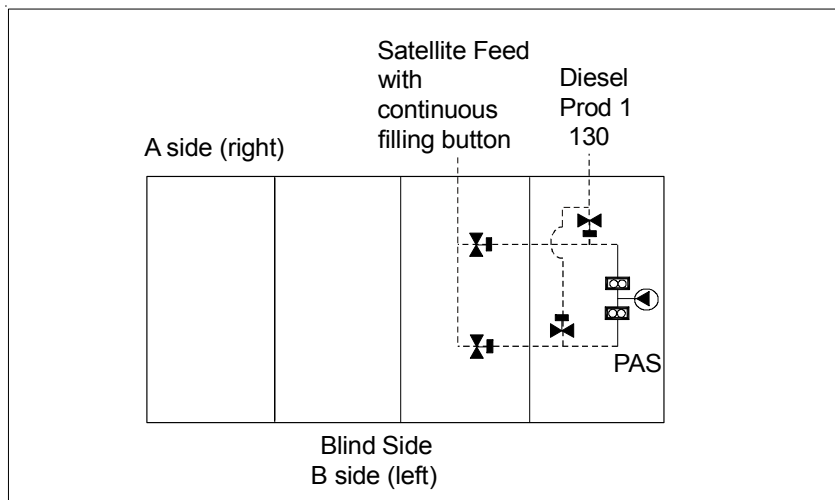
Model VHS 2-4 (1-4) (40 / 130 shared)



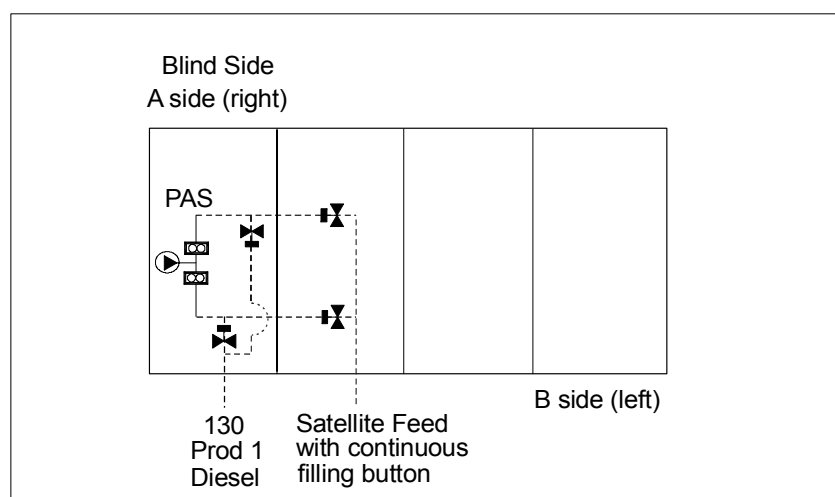


## 2.2.4 MASTER &amp; SATELLITE MODELS

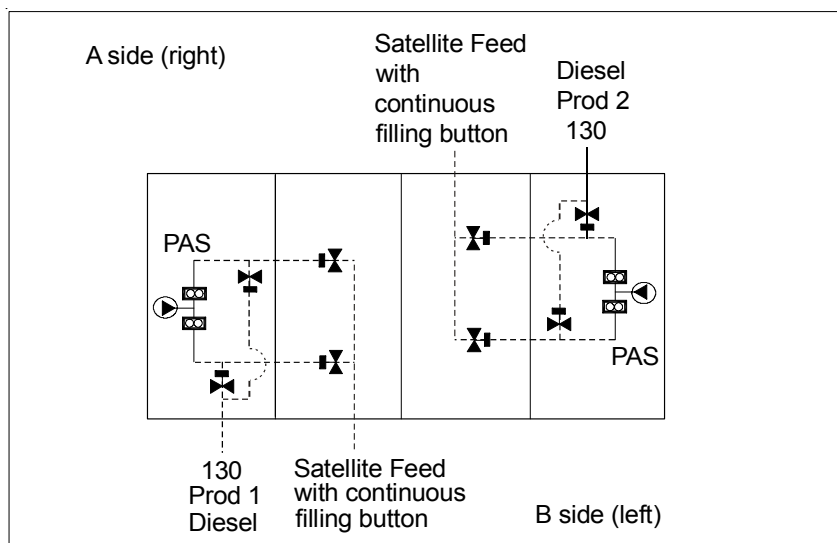
## Model VHSM 1-1 A Side (Right)



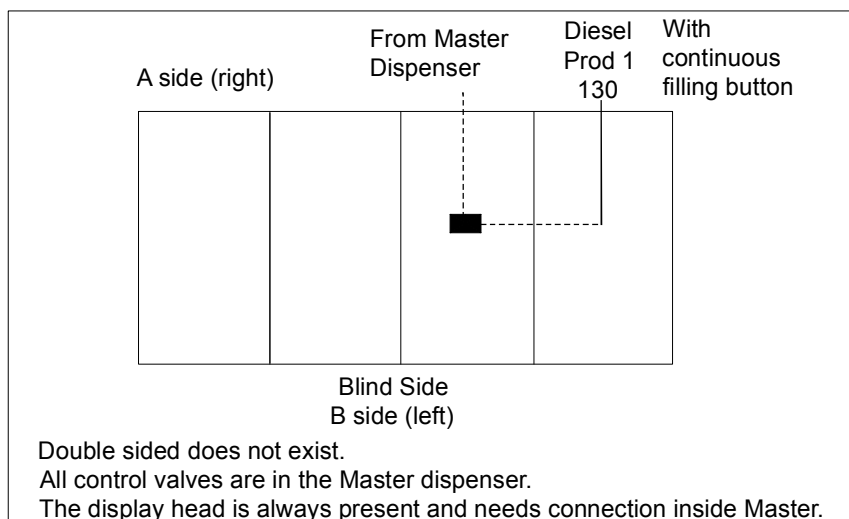
## Model VHSM 1-1 B Side (Left)



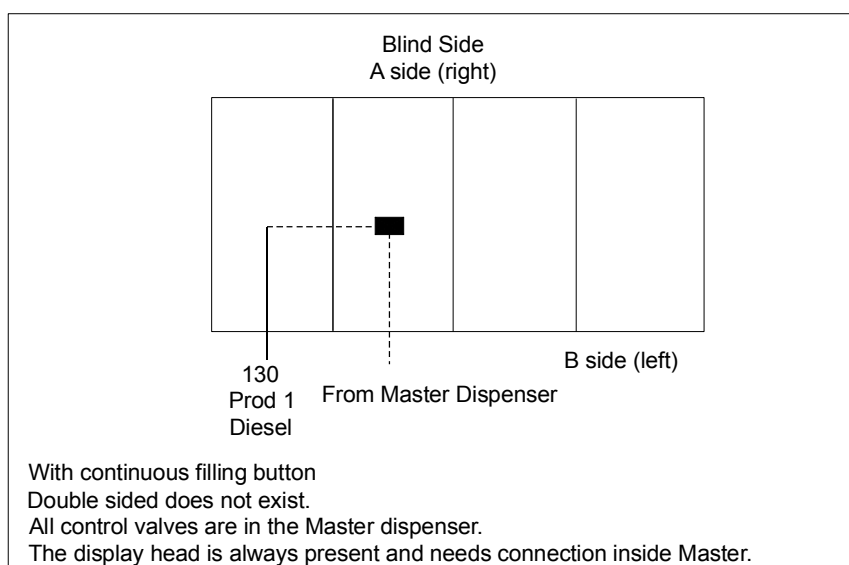
Model VHSM 1-2



Model SAT - Side A (Right)



Model SAT - Side B (Left)



## 2.3 Hydraulic Connections

The Installer is responsible for supplying the riser pipe to the heights given in this section and all pipework and connections below the dispenser.

For new installations, the riser pipes will be positioned directly below the filter box (where fitted), accessible from side B of the dispenser (see section 5.2 for the identification of side B). Different types of hydraulic connection are available depending on the dispenser configuration.

**PLEASE NOTE :- If the inlet riser pipe has a female connection, an adaptor must be used.**

If an adaptor is used, the dimensions shown will need to be reduced (maximum 36mm).

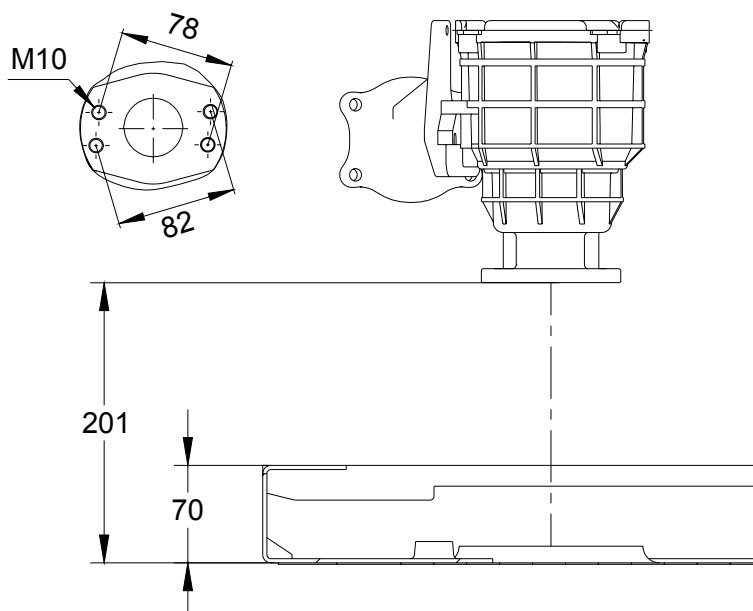
### GROUNDFRAMES

For **new installations**, ensure that the top of the groundframe is level with the height of the finished island, including any tiling and/or cladding.

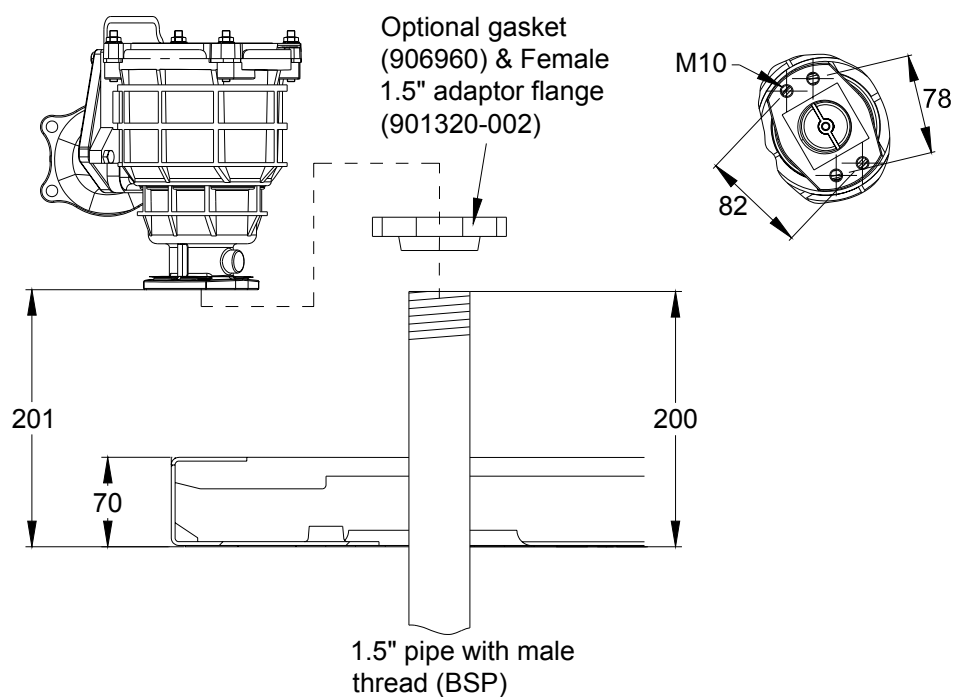
For **retrofit installations**, the fixing points on the existing Q400T groundframe are compatible with Q410 dispensers but the Q410 dispenser is wider (520mm) than the Q400T dispenser/groundframe (500mm). This means that, where any tiling and/or cladding is higher than the top of the groundframe, packing material will be required to make the surface level.

#### 2.3.1 DIRECT CONNECTION

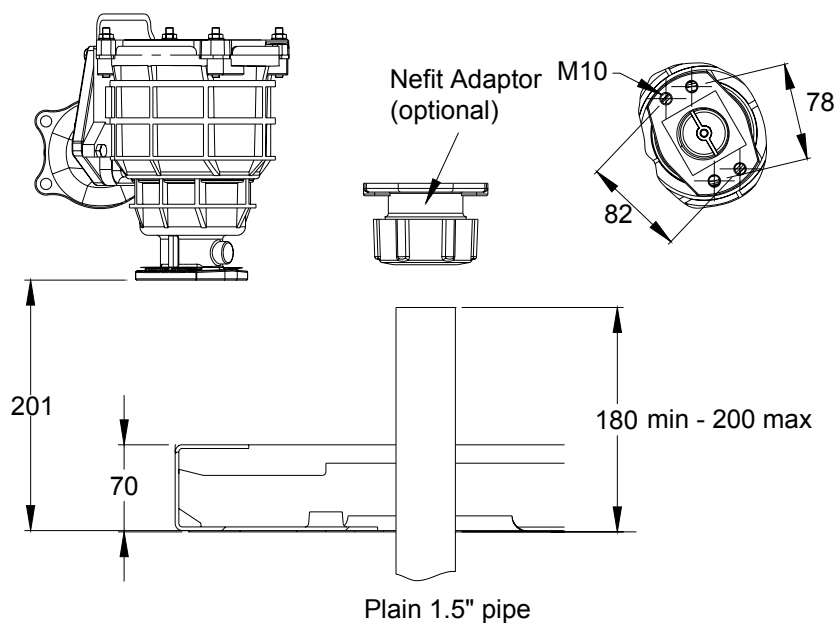
##### Standard Direct Connection (Suction)

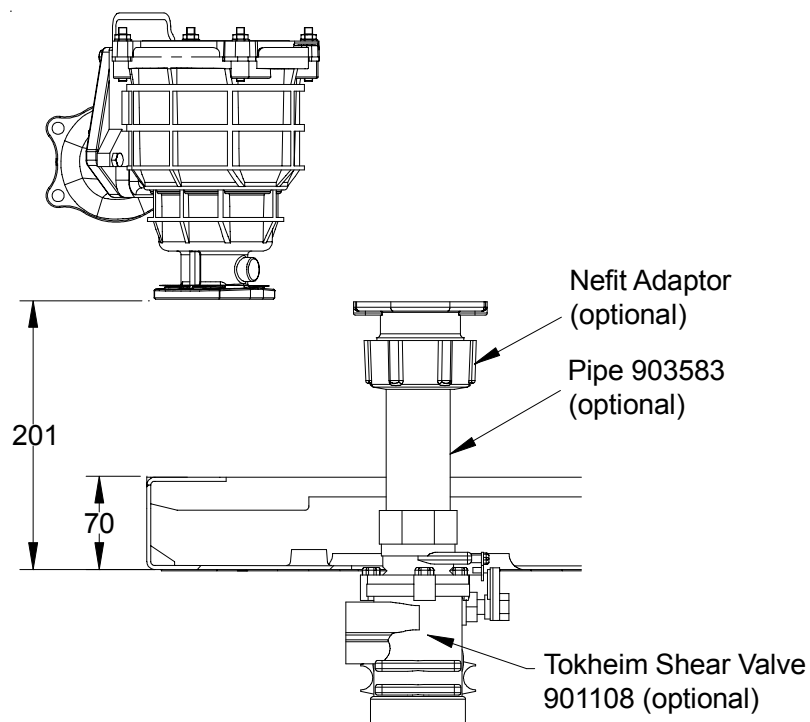
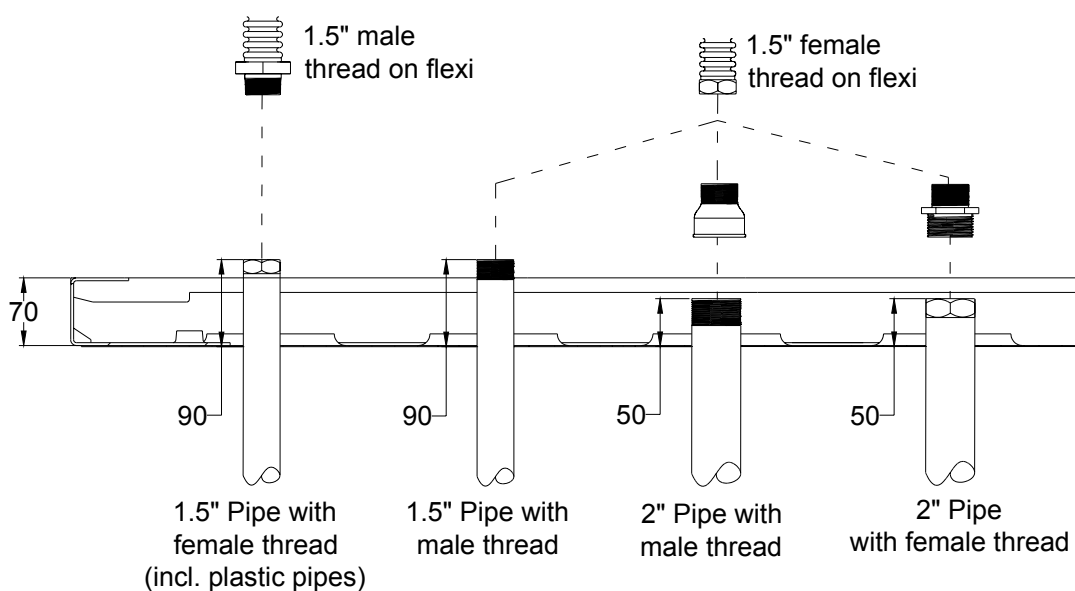


**Direct Connection with Adaptor Flange option (Submerged)**



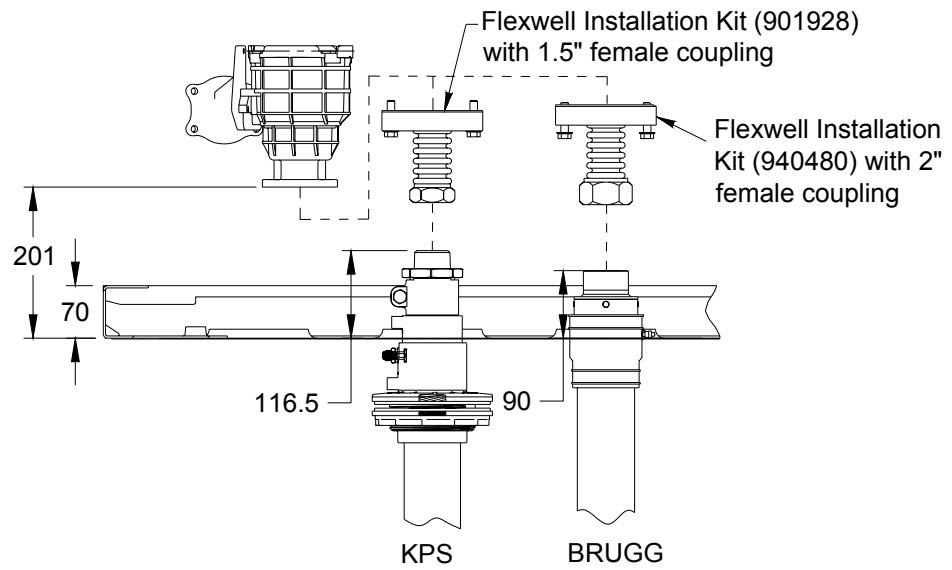
**Direct Connection with Nefit Adaptor option**



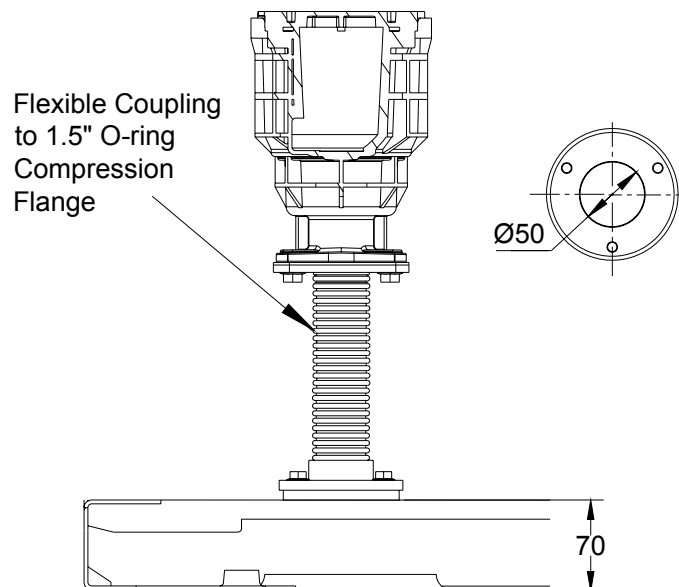
**Direct connection with Nefit Adaptor & Tokheim Shear Valve option****2.3.2 FLEXIBLE CONNECTION (SUCTION ONLY)****Recommended Riser Heights****Note :**

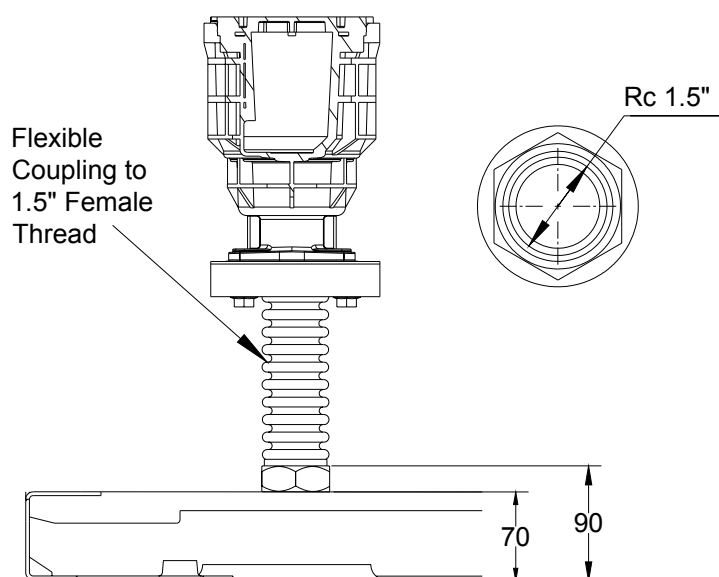
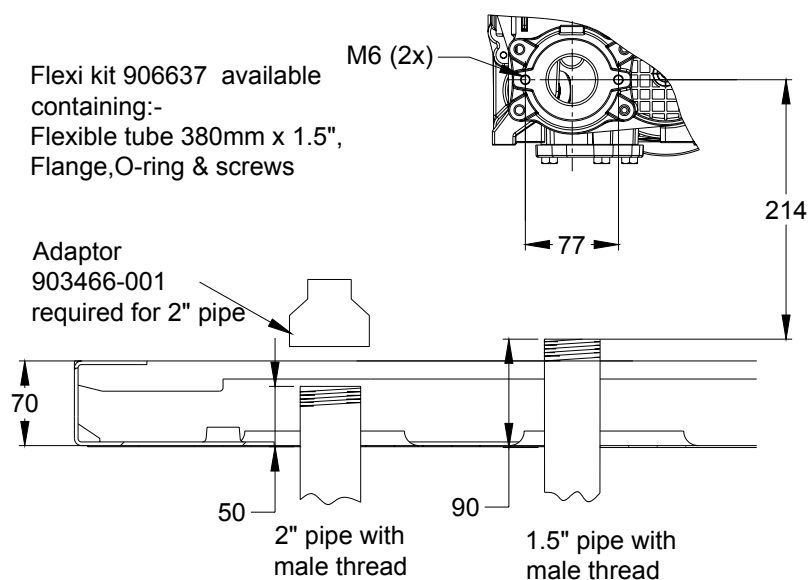
The rubber cover (manchet) for the drip tray must be lower than the pipe joints (& thread adaptors)

**Filterbox with Special KPG & Brugg Connections**

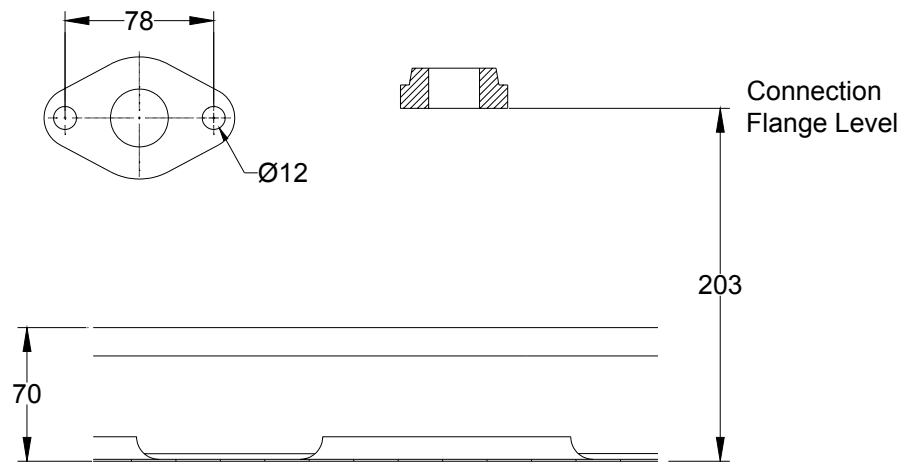


**Filterbox with Flexible Coupling to 1.5" O-Ring Compression Flange**

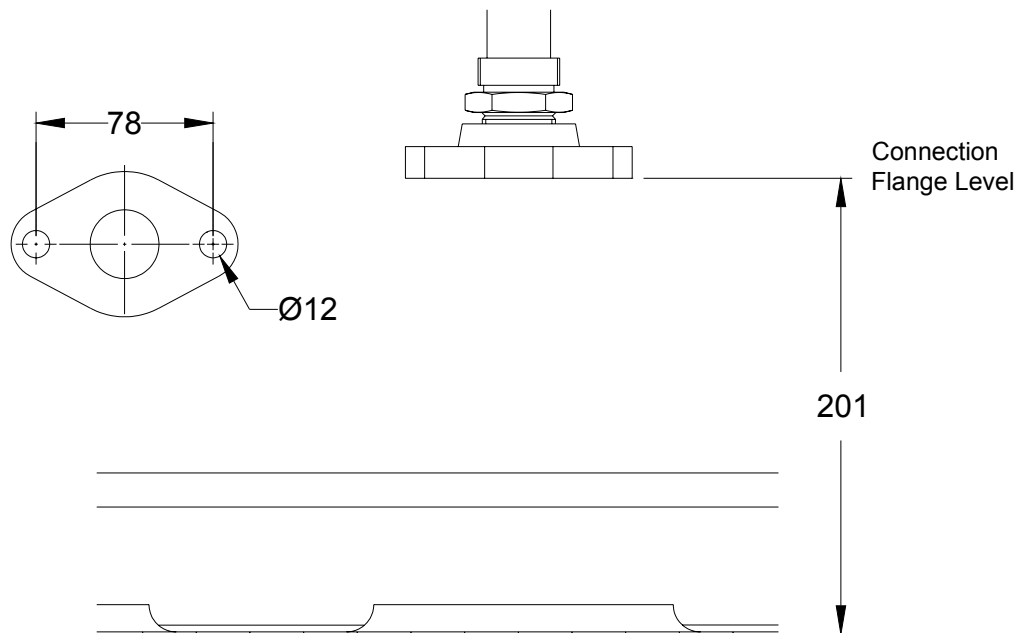


**Filterbox with Flexible Coupling to 1.5" Female Thread****EPZ Internal Filter & Flexible Coupling**

### 2.3.3 MASTER TO SATELLITE CONNECTION

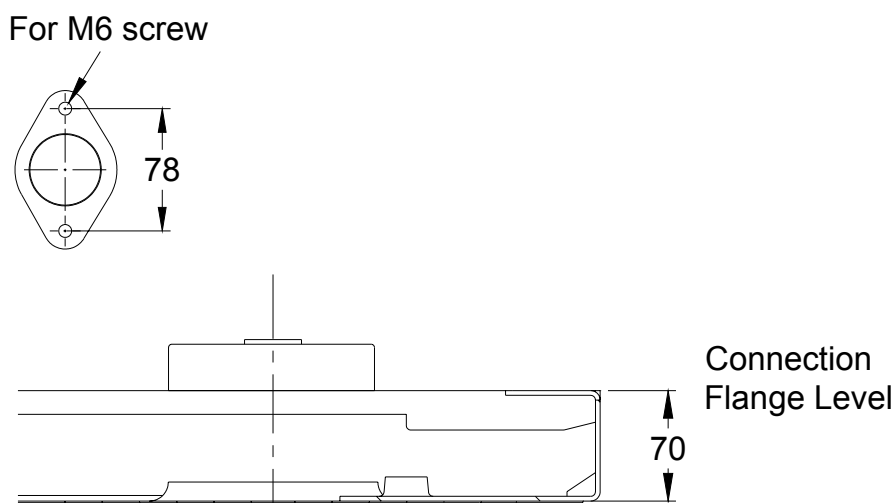
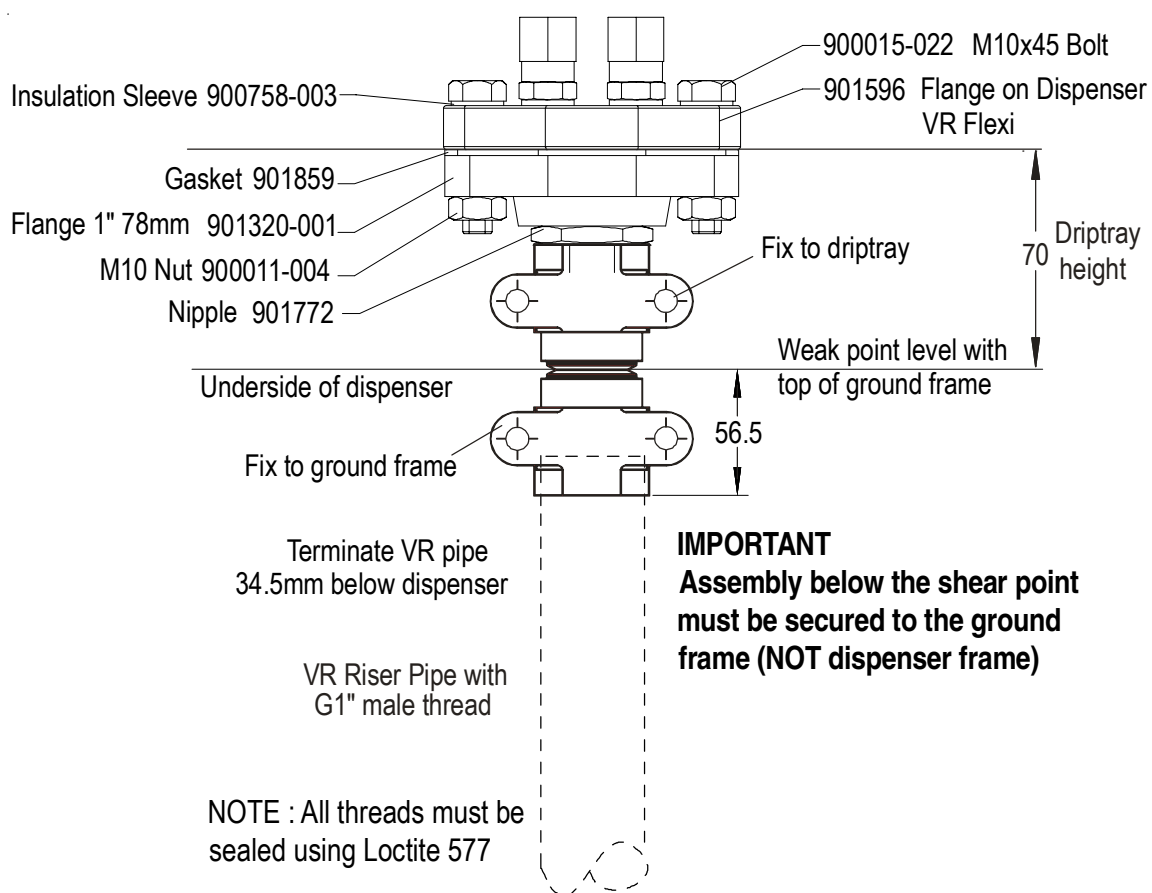


### 2.3.4 SATELLITE CONNECTION

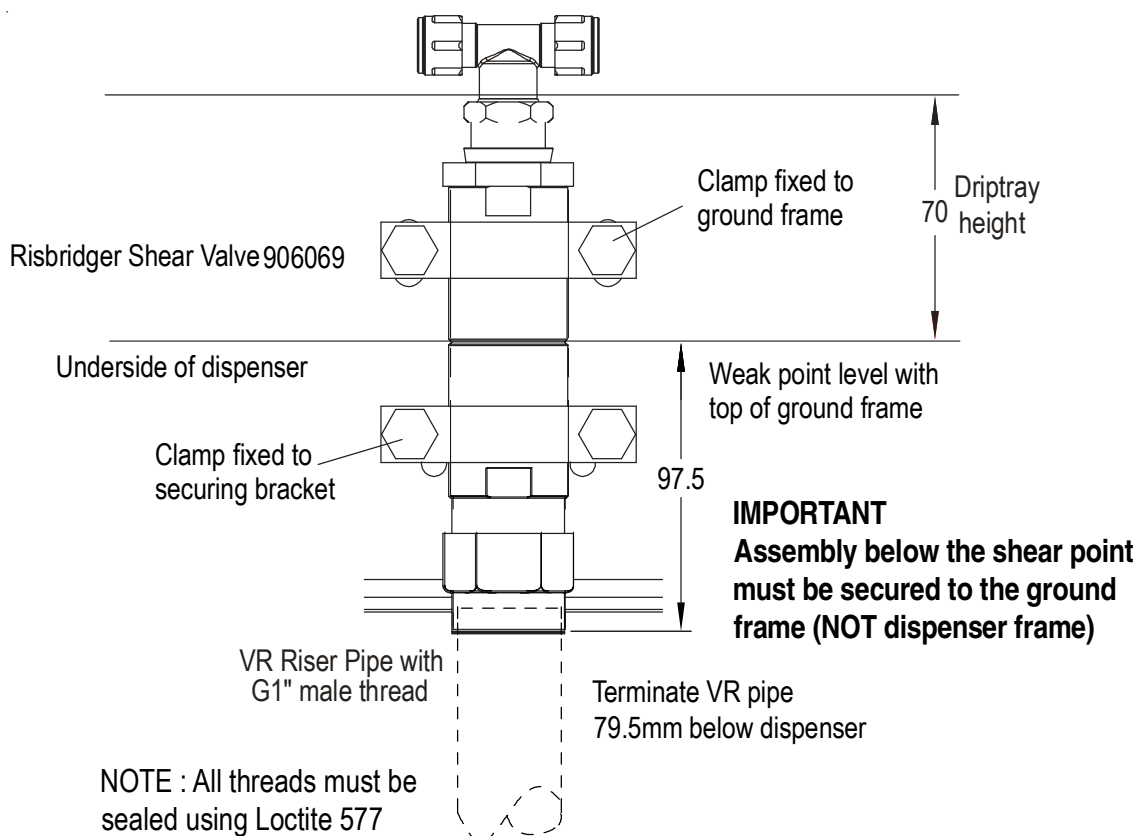




## 2.3.5 VAPOUR RECOVERY CONNECTIONS

Standard VR ConnectionVR Connection with OPW Shear Valve (Option)

**VR Connection with Risbridger Shear Valve (UK & EIRE) Kit**



**SPECIAL INFORMATION RELATING TO HIGH BLEND ETHANOL FUELS (HBEF) & VAPOUR RETURN (VR) RETURN LINES**

Following extensive explosion safety tests with HBEF by PTB, Tokheim recommends all pipework back to the vapour space of the HBEF storage tank should be protected by special flame arresters.

The vapour return line to the underground storage tank should be protected in the event of a vehicle collision with a dispenser and also for maintenance operations. The flame arrester(s) in the dispenser VR pump do not meet this requirement.

An additional flame arrester must be positioned under the dispenser and must be protected from potential damage during a vehicle collision so it remains connected to the vapour return line to the tank in the event that the dispenser is knocked off the island.

*Note : This flame arrester is a requirement of the installation, not a requirement of the dispenser.*

If the Stage II VR return lines are routed back to the HBEF tank then the VR return line from the dispenser vapour recovery system should protect the tank by including a flame arrester.

The correct type of flame arrester must be carefully selected:-

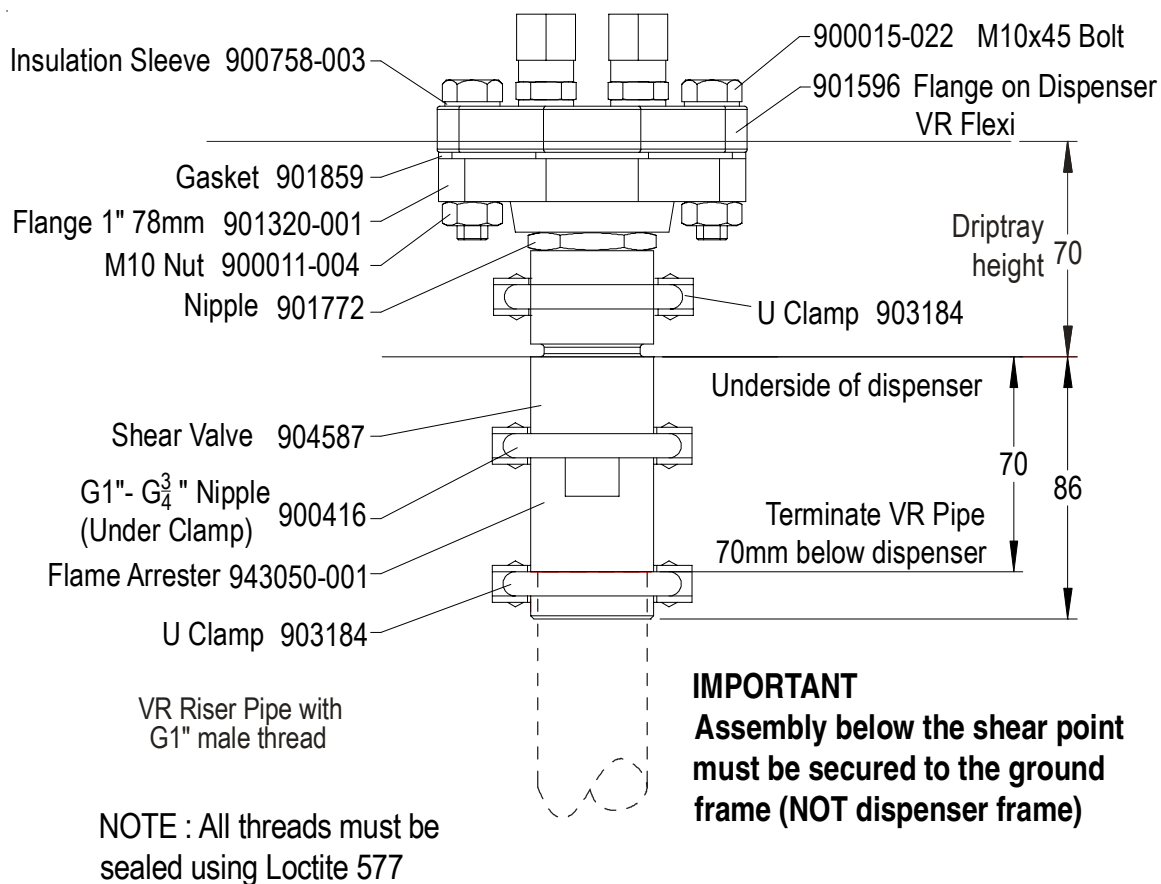
- Deflagration or detonation arrester dependent upon its position relative to the anticipated end of line
- Inline type (unless it can be guaranteed to be at the end of line during maintenance or after a vehicle collision)
- End of line types will need to be suitable for use with burning alcohol
- Arrester must be suitable for the correct Gas Group:-
  - Ethanol blends 60% to 90% require Gas Group IIA Arresters
  - Ethanol blends >90% require Gas Group IIB1 Arresters
- Arrester must be manufactured from materials suitable for use with ethanol and bio-ethanol blended fuels

Tokheim offer two kits for use with Quantium dispensers to fulfil these requirements, both kits using the inline deflagration flame arrester certified for use with Gas Group IIB1 thus suitable for all percentage ethanol blends. The kit must be installed in close proximity to the underside of the dispenser in accordance with the drawings in this section.

- The standard kit includes an intentionally weak section above the arrester to ensure that the device remains on the underground vapour pipe following a vehicle collision
- The alternative kit includes a certified shear valve (with poppets) above the arrester which additionally ensures that the line back to the tank is closed following a vehicle collision

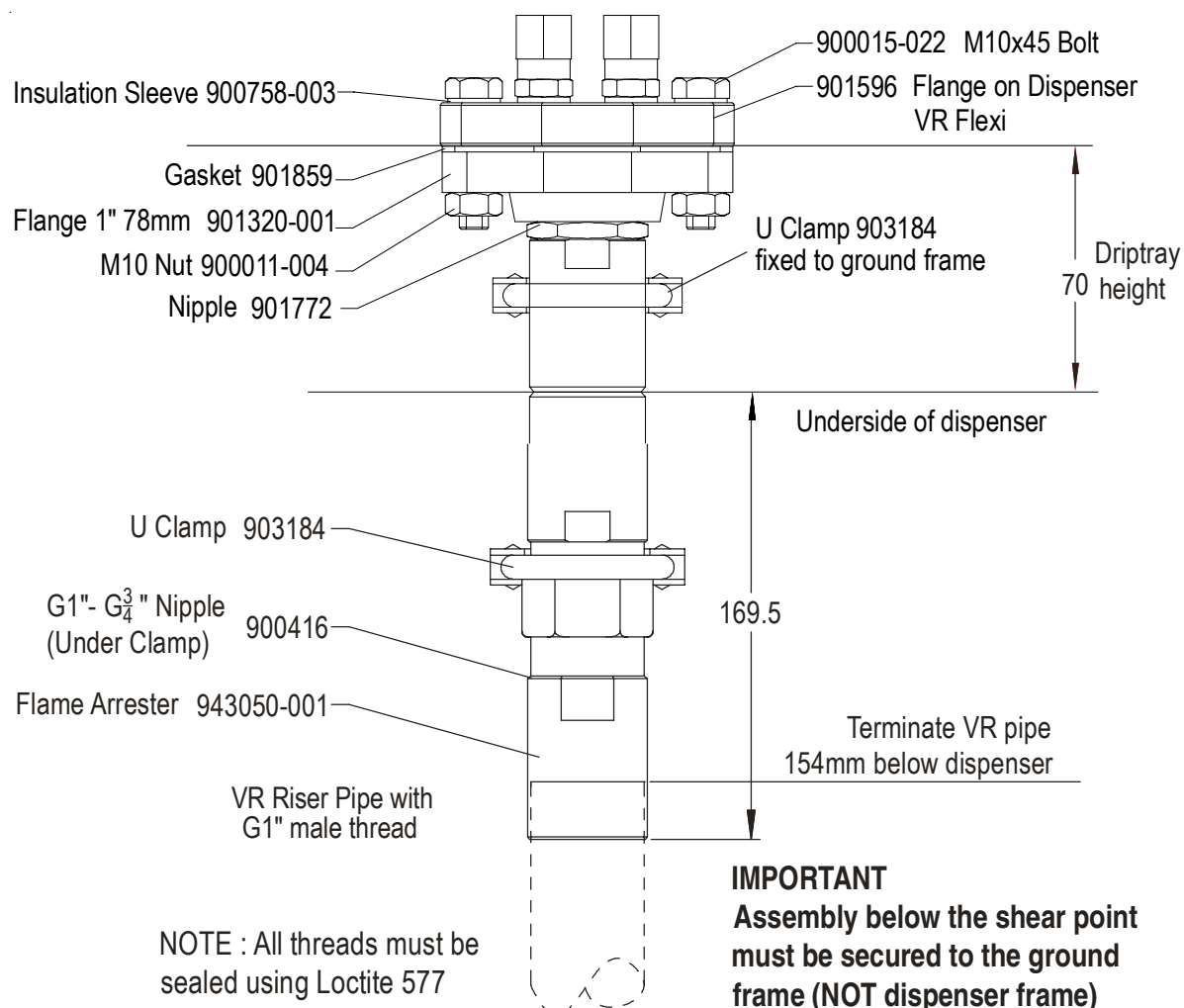
**VR Connection with Shear Point & Flame Arrester for Ethanol**

Kit 1 - Tokheim Part No 943143-001



**VR Connection with Risbridger Shear Valve & Flame Arrester for Ethanol**

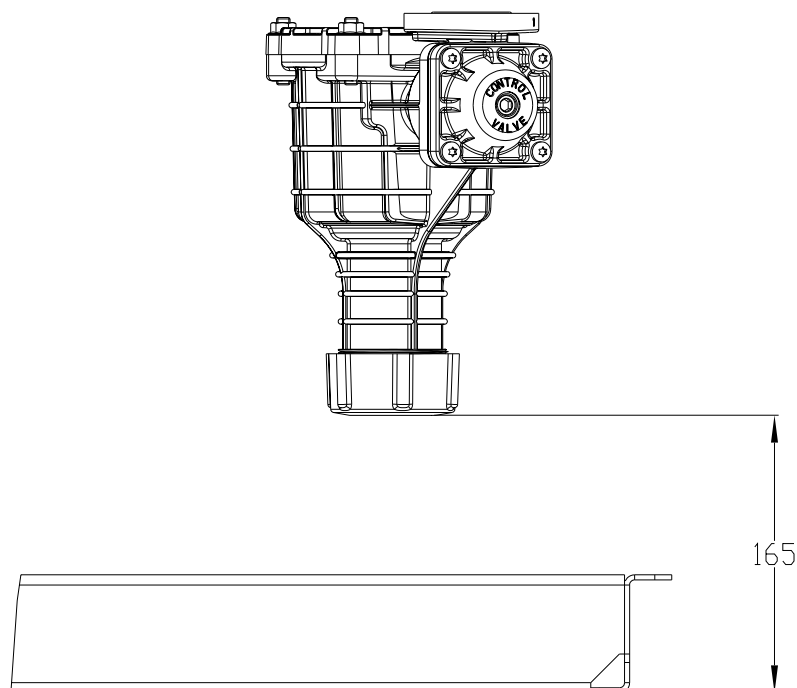
Kit 2 - Tokheim Part No 943143-002

**2.4 Electrical Connections**

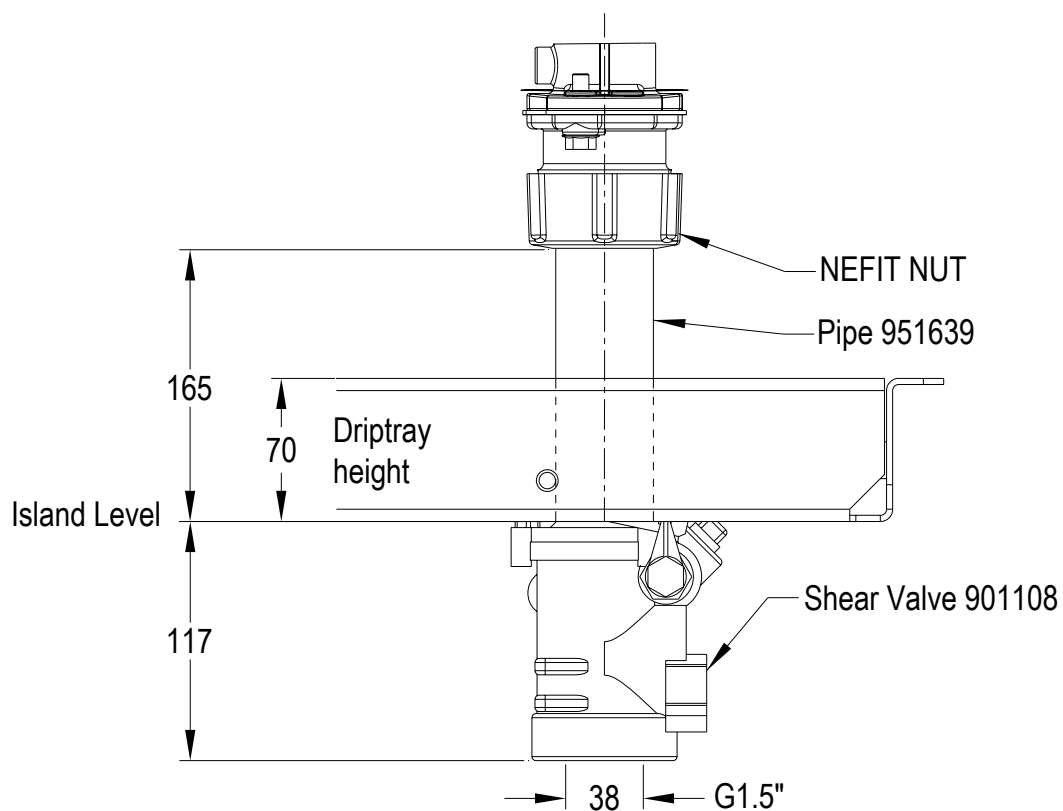
The electrical connection to be established between the kiosk and the dispenser exists in different configurations. The mains connection (power from the mains supply panel to the dispenser) and the data connection (link between forecourt controller and calculator) are customer, country and configuration specific. The number of cores and the cross section of the cable will be specified, as will the cable construction (armoured or Explosion proof) and guidance troughs, channels or cable trunks have to be carried out in accordance with national technical regulations.

## 2.5 Submerged Connections

### Submerged Connection only (with Filterbox, without Flexible coupling)



### Submerged Connection with Shear Valve (Filterbox only)



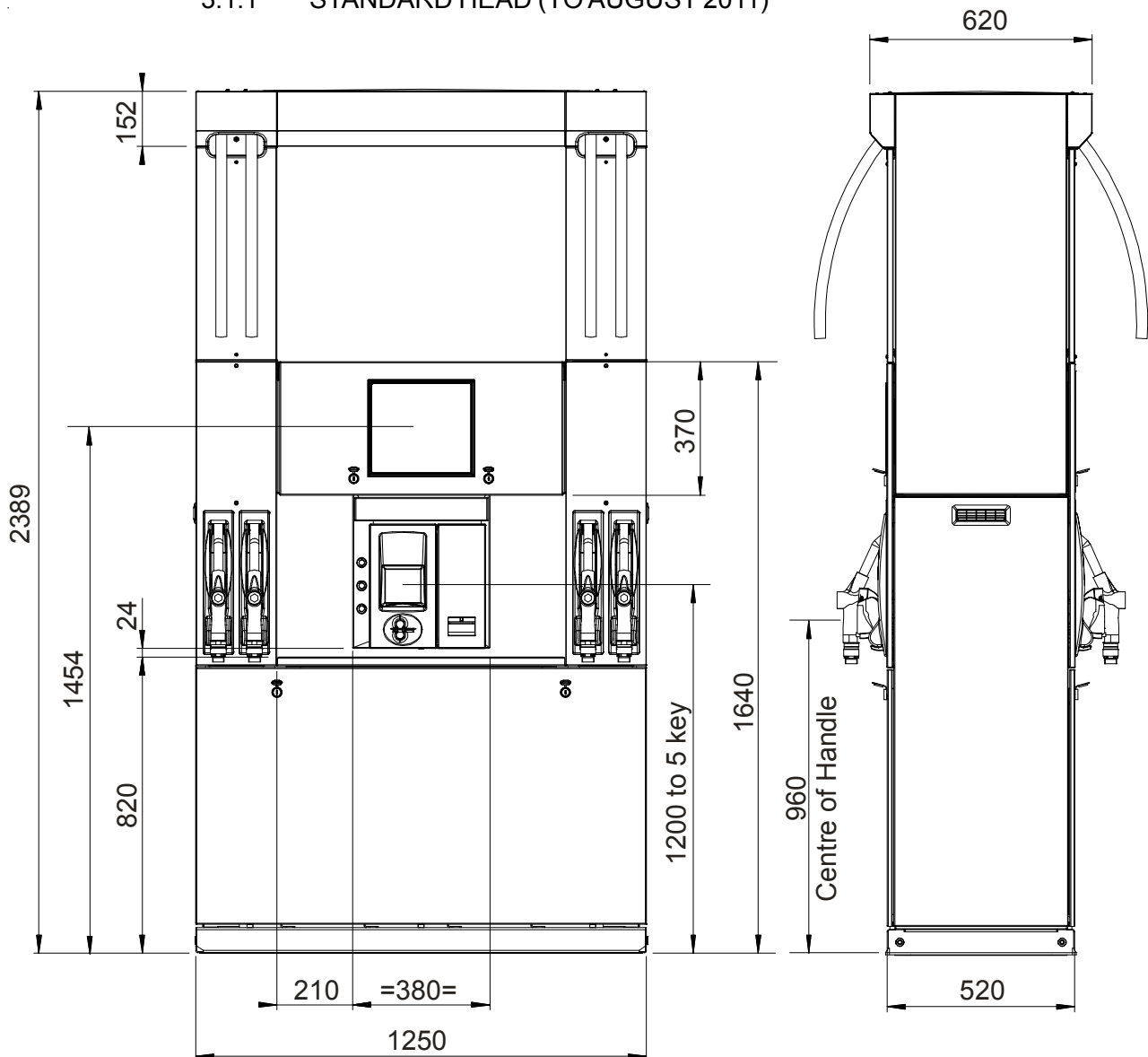
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### 3 DRAWINGS

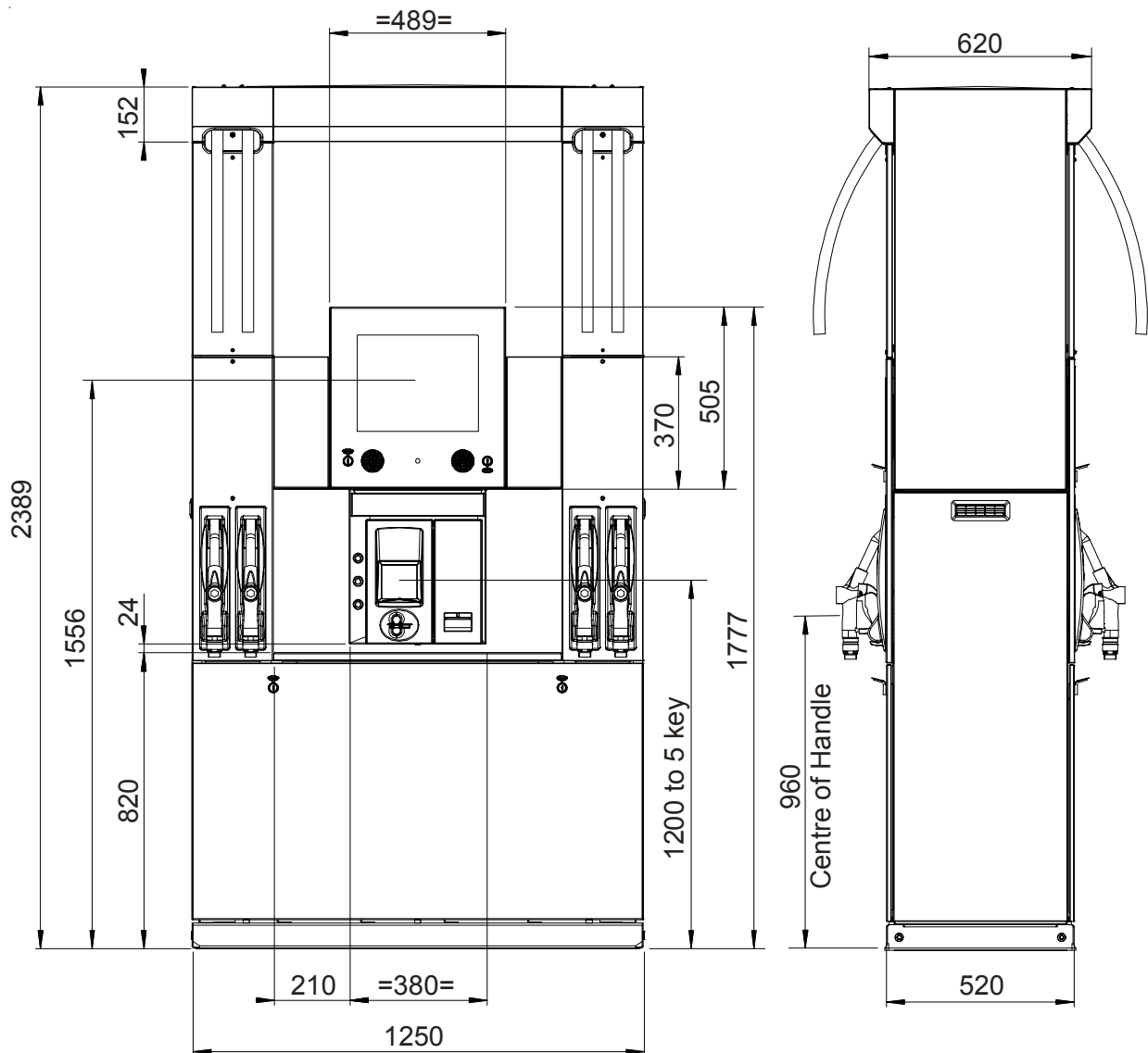
#### 3.1 Dispenser Dimensions.

##### 3.1.1 STANDARD HEAD (TO AUGUST 2011)

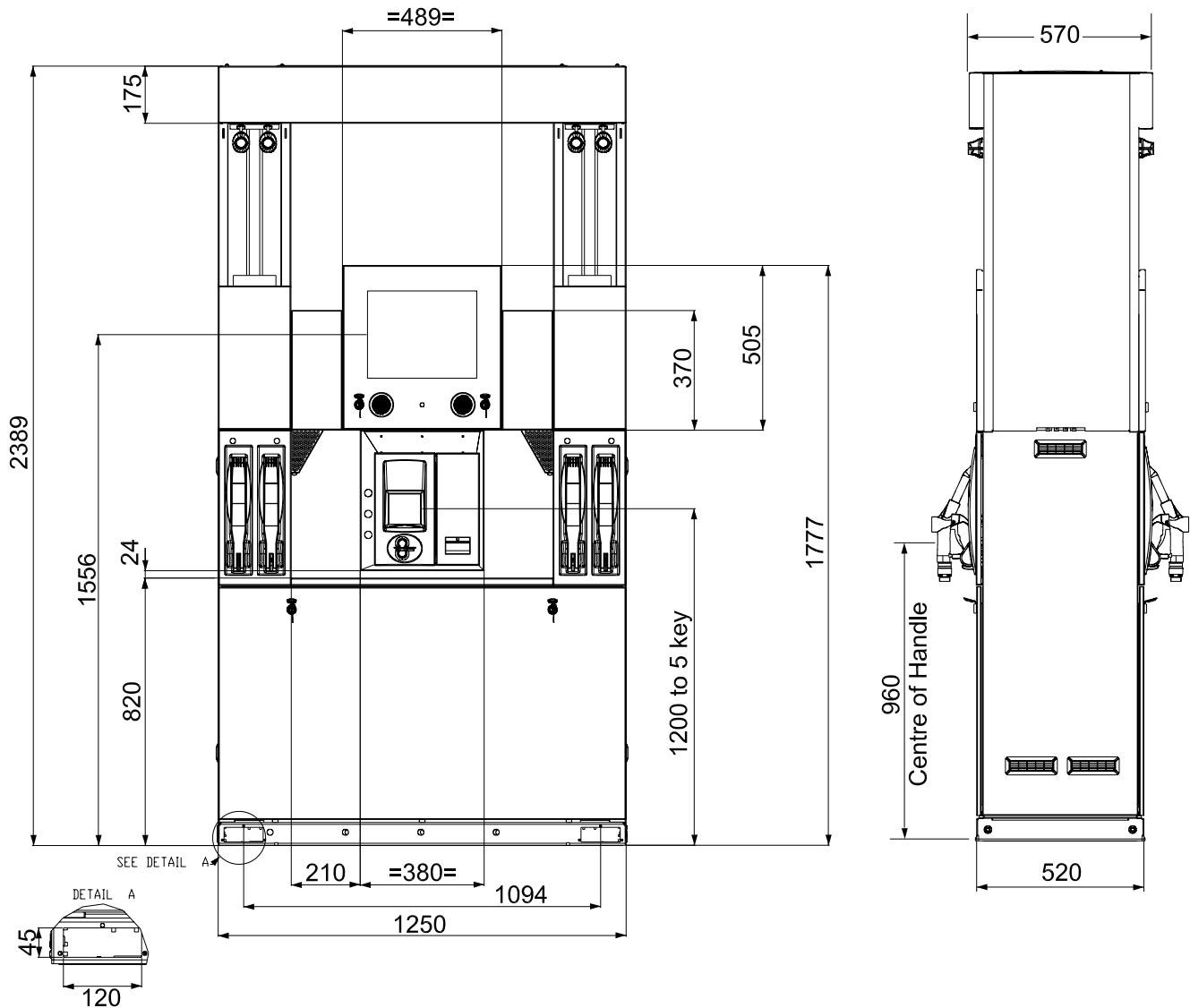




## 3.1.2 TQC -VGA MEDIA HEAD (FROM SEPTEMBER 2011)

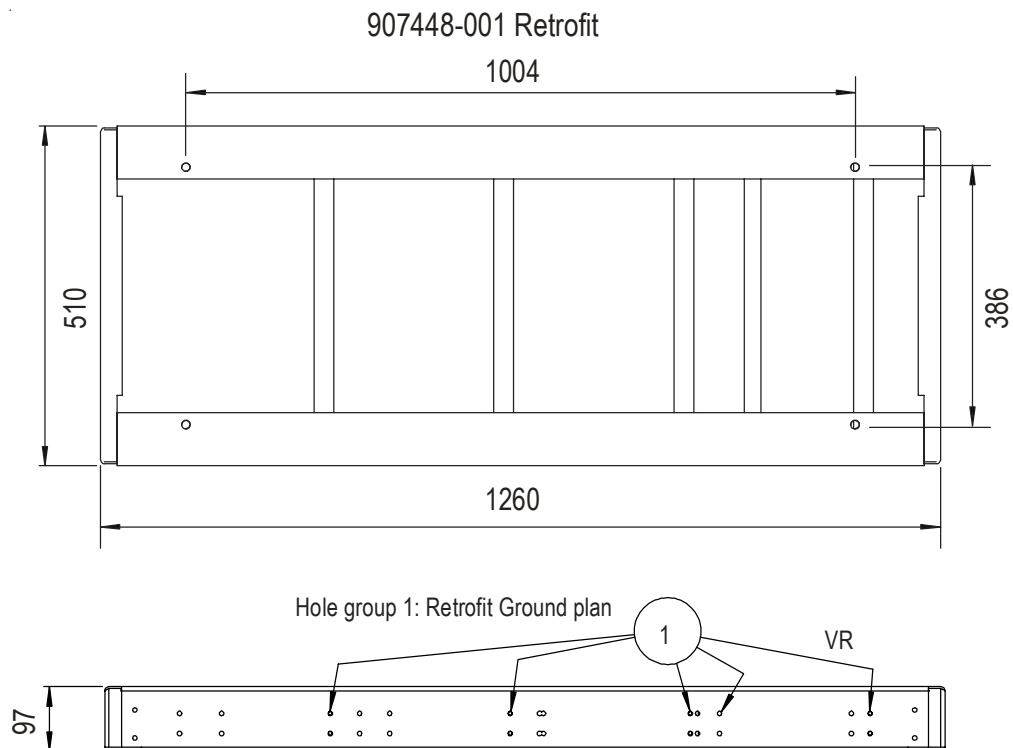


3.1.3 Q410 LC - STANDARD HEAD

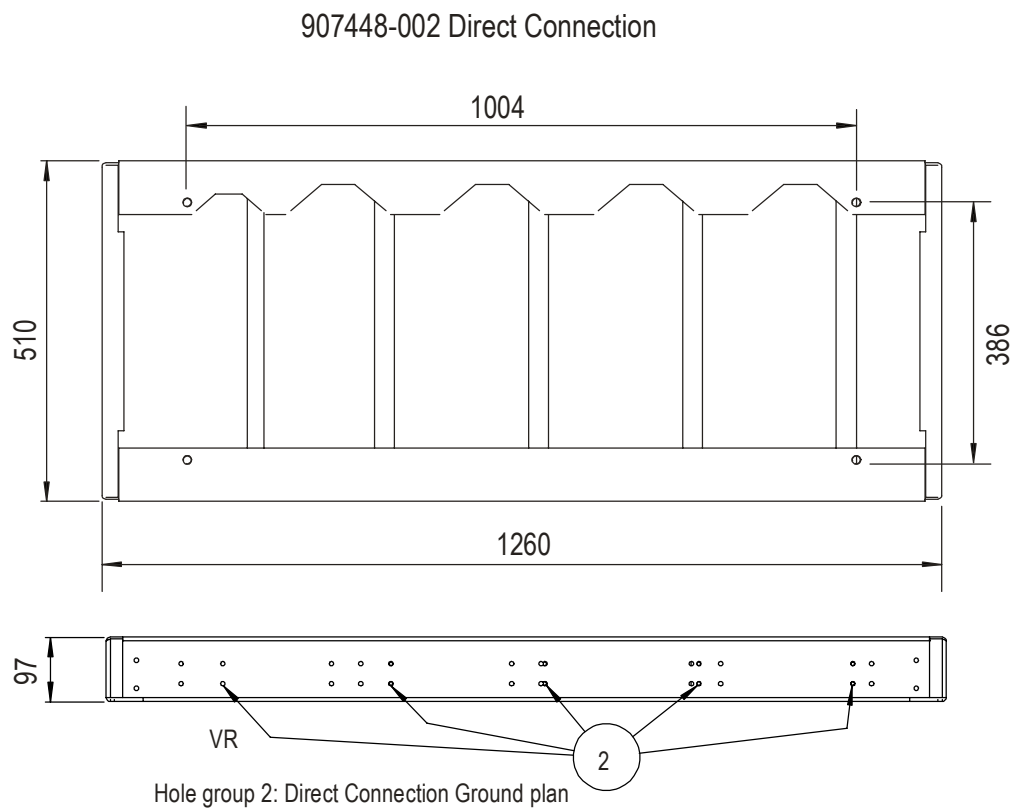


### 3.2 GroundFrames

#### 3.2.1 RETROFIT GROUNDFRAME



#### 3.2.2 DIRECT CONNECTION GROUNDFRAME



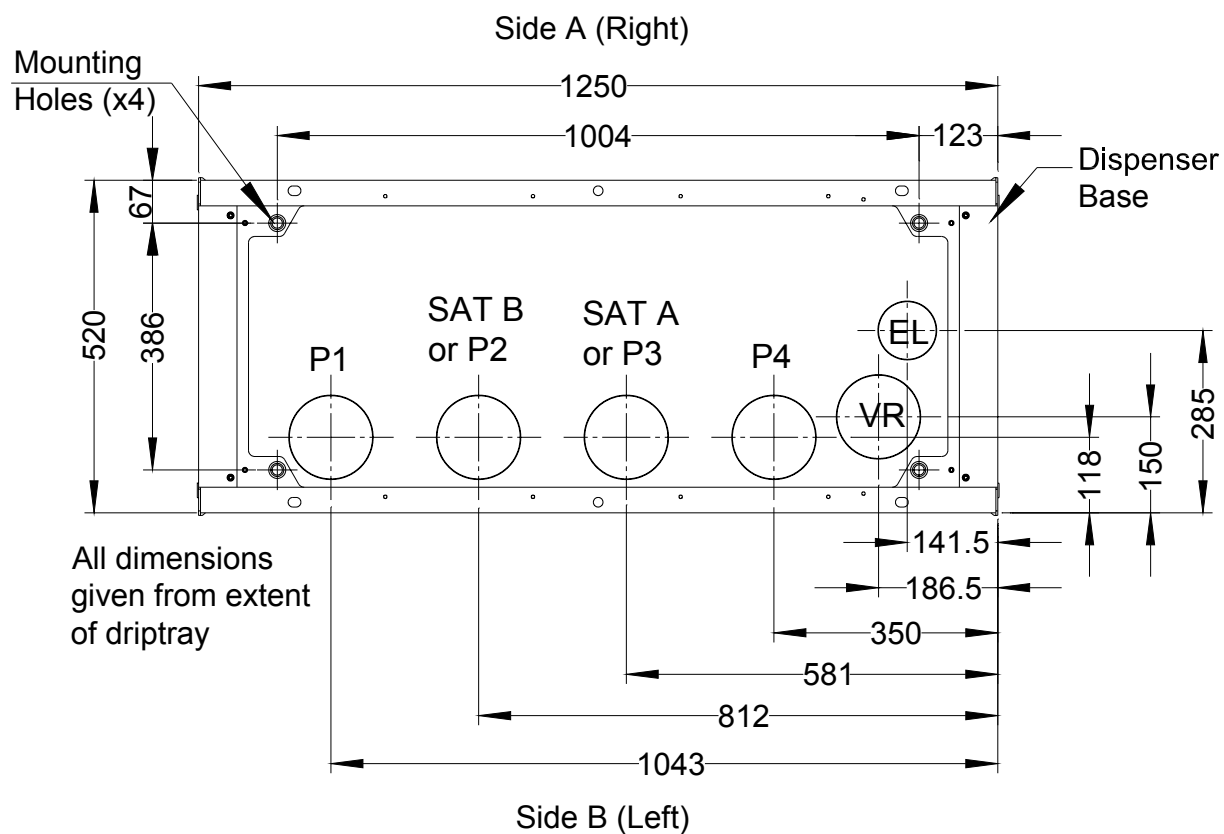
### 3.2.3 GROUNDFRAME PART NUMBERS



M O D E L	C O N F I G U R A T I O N	G R O U N D F R A M E P A R T N U M B E R	C O M M E N T S
All Models	Suction	907448-002	Without transversal bracket
All Models	Submerged	907448-002	With transversal bracket to block rigid pipe
All Models	Suction	946553	For BRUGG risers
All Models	Suction	946554	For KPS riser
All Models	Suction	946555	For KPS riser (Designed for Italy)

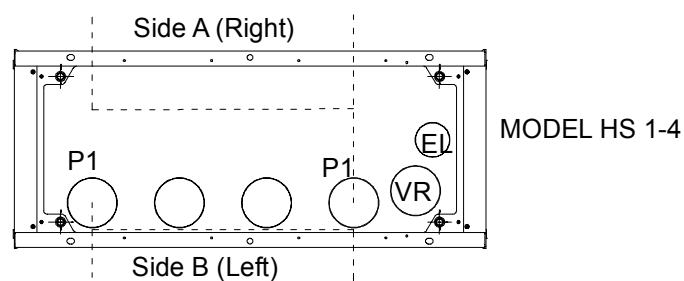
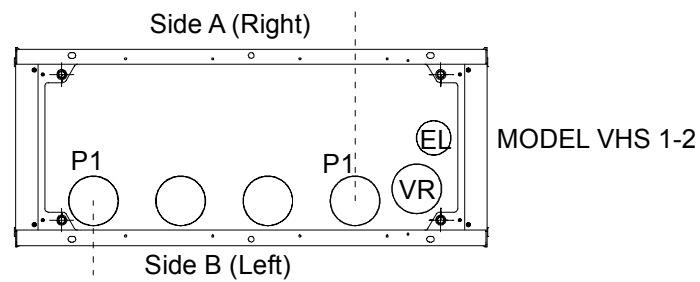
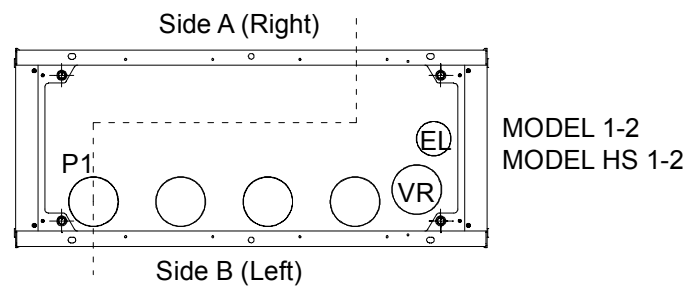
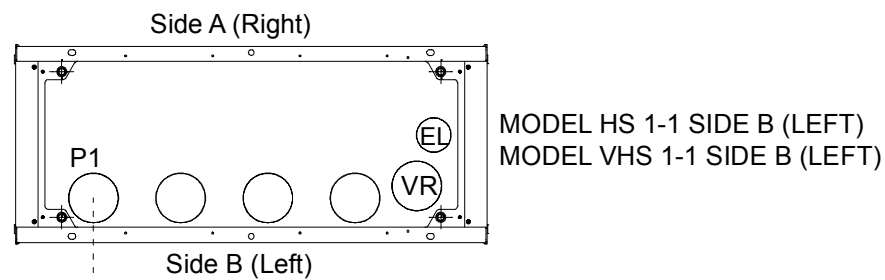
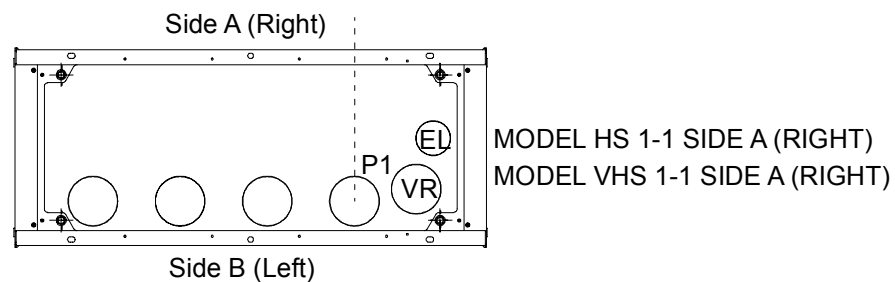
## 3.3 Ground Plan - New Installations only

### 3.3.1 GENERIC DRIPTRAY



## 3.3.2 SINGLE PRODUCT

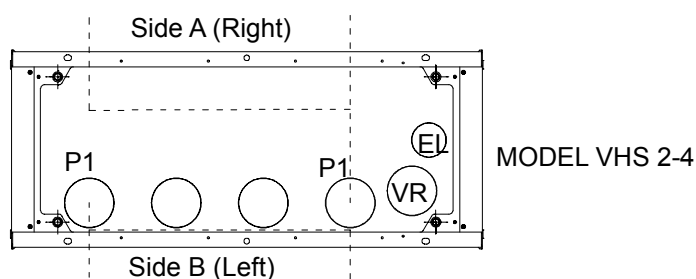
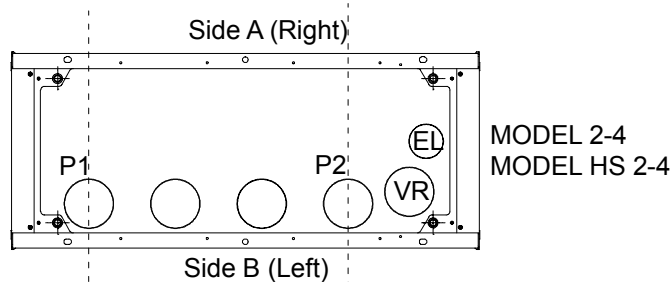
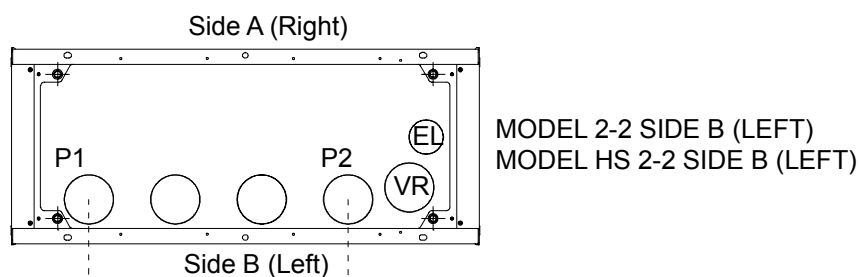
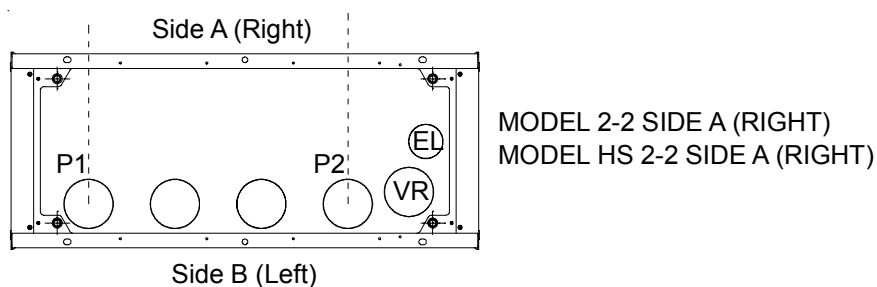
(MODELS 1-2, HS 1-1, HS 1-2, HS 1-4, VHS 1-1, VHS 1-2)



Key  
P1 = Product 1  
EL = Electrical Supply  
VR = VR per dispenser

### 3.3.3 TWO PRODUCT

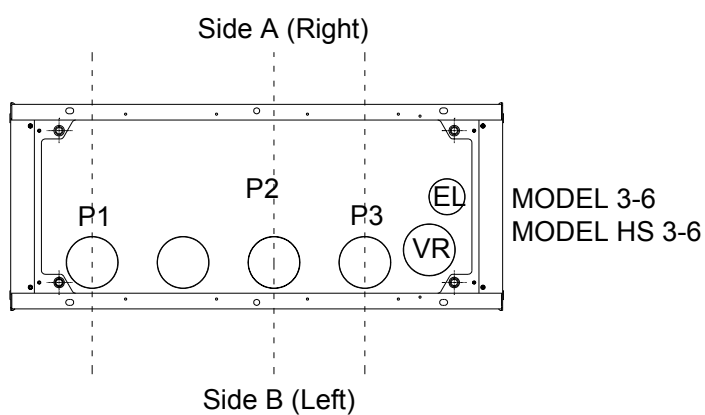
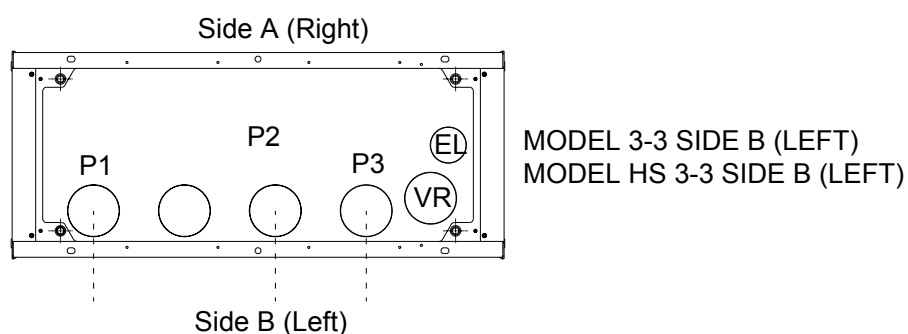
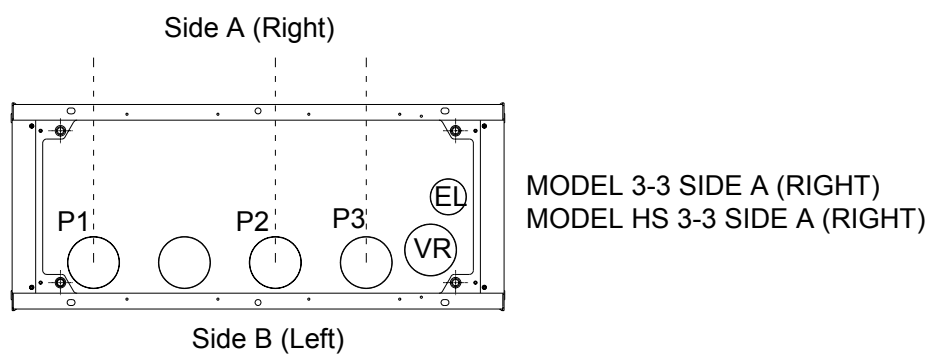
(MODELS 2-2, 2-4, HS 2-2, HS 2-4, VHS 2-4)



Key  
P1 = Product 1  
P2 = Product 2  
EL = Electrical Supply  
VR = VR per dispenser

## 3.3.4 THREE PRODUCT

(MODELS 3-3, 3-6, HS 3-3, HS 3-6)



## Key

P1 = Product 1

P2 = Product 2

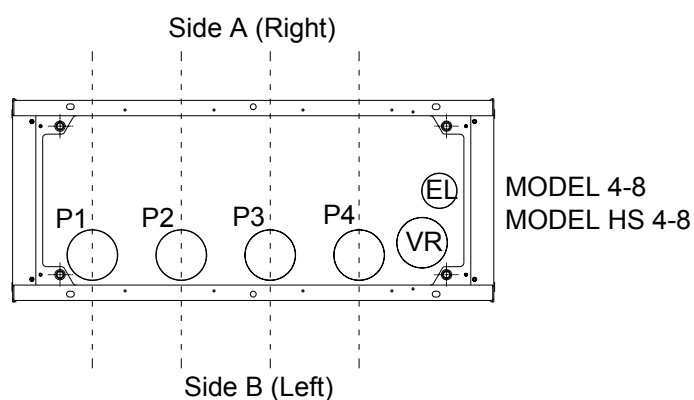
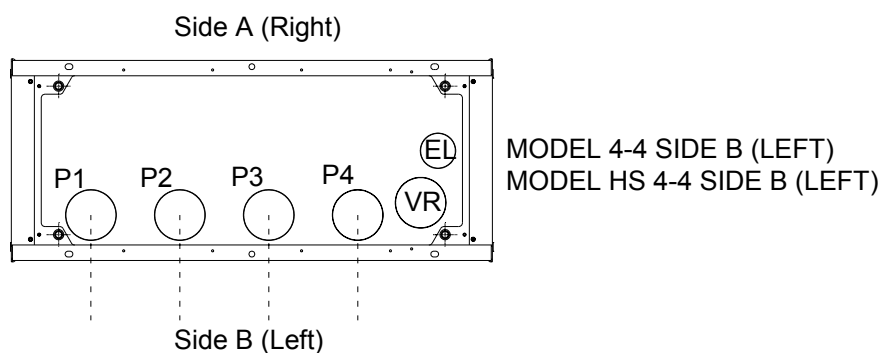
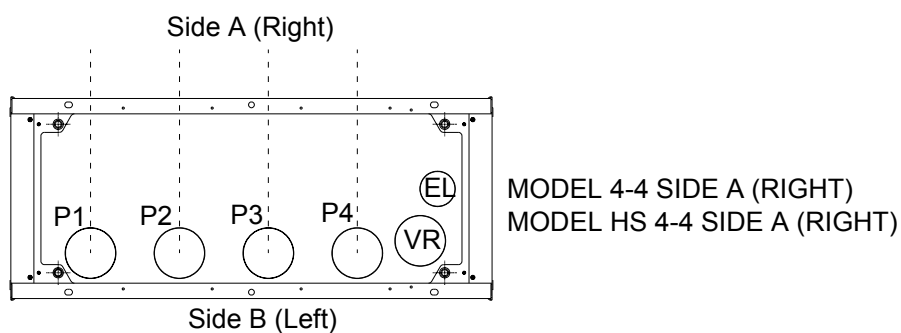
P3 = Product 3

EL = Electrical Supply

VR = VR per dispenser

### 3.3.5 FOUR PRODUCT

(MODELS 4-4, 4-8, HS 4-4, HS 4-8)

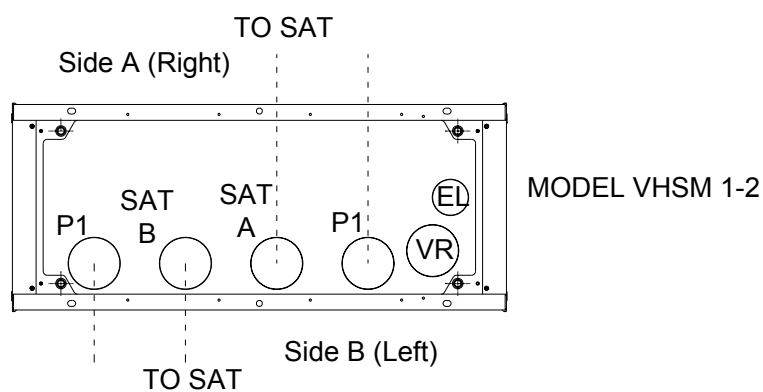
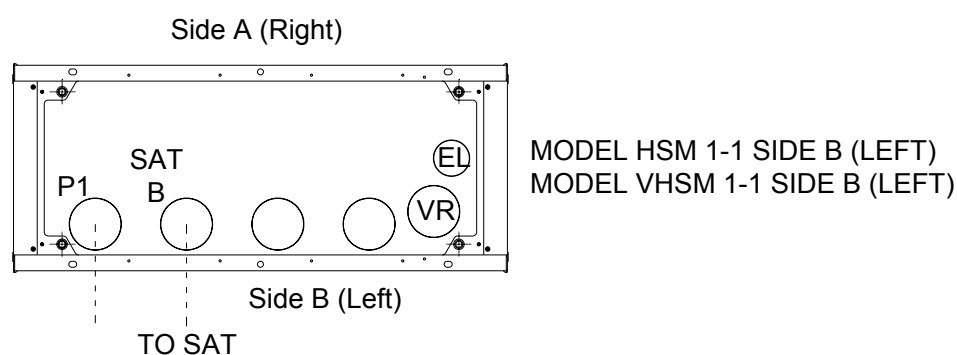
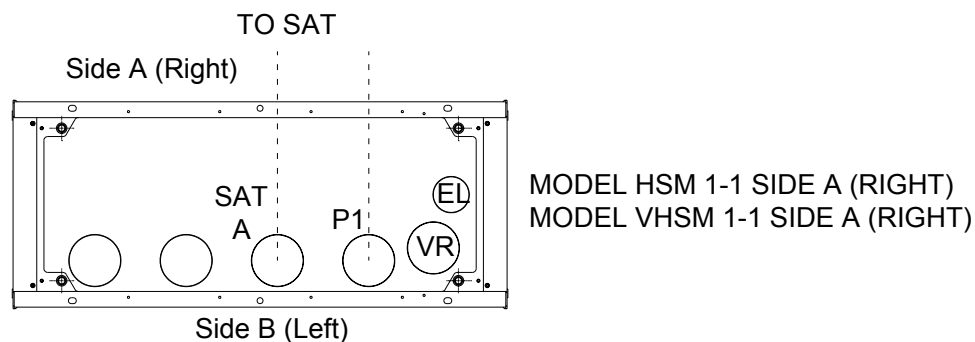


Key  
P1 = Product 1  
P2 = Product 2  
P3 = Product 3  
P4 = Product 4  
EL = Electrical Supply  
VR = VR per dispenser



## 3.3.6 MASTER

(MODELS HSM 1-1, VHSM 1-1, VHSM 1-2)



## Key

P1 = Product 1

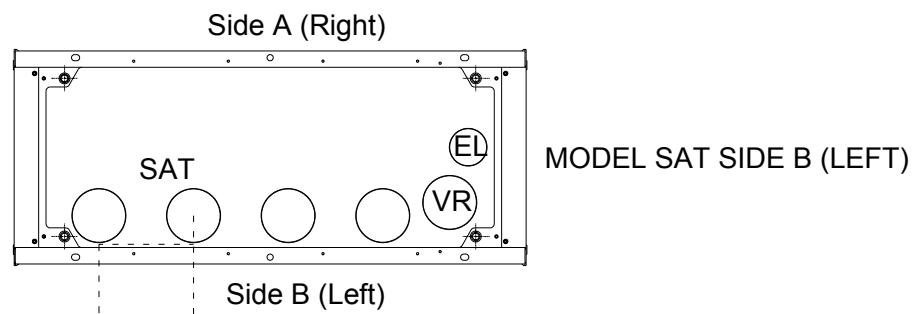
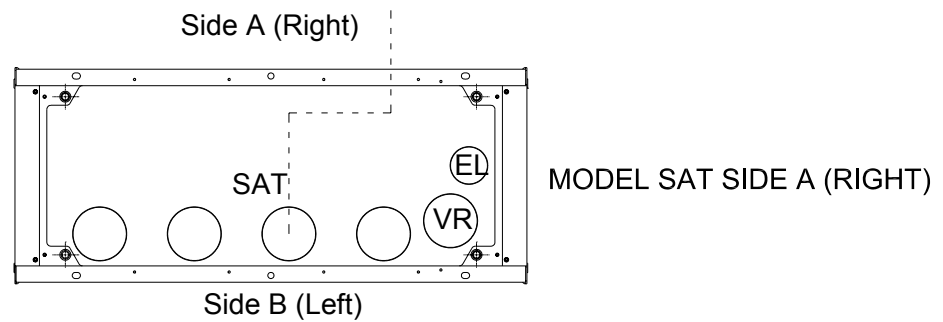
EL = Electrical Supply

VR = VR per dispenser

SAT A = Satellite Feed Side A

SAT B = Satellite Feed Side B

3.3.7 SATELLITE



Key  
 EL = Electrical Supply  
 SAT = Satellite Inlet

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## **4 PACKAGING & HANDLING**

### **4.1 Shipping Documentation**

The following documents will accompany every delivery:-

- Shipping List
- Packing/Checking List
- CE Sticker
- Certificate of Conformity

The Serial Number on the dispenser should be identical to the Serial Number on the Shipping List, CE sticker and Certificate of Conformity. Please inform Tokheim UK Ltd before unpacking if there are any discrepancies in the notation.

### **4.2 Packaging**

The type of packing depends on the destination of the goods. All products containing a frame are fixed on a pallet by means of screws and by the use of beams or blocks screwed onto the frame.

The goods are protected from moisture and scratching by bubble wrap and polystyrene corner blocks and a standard carton is used for packing. Where the use of a forklift truck or pallet truck is necessary, special arrangements make this possible through the use of pallets, beams, dispenser beam bridges or blocks.

All separate components belonging to the same delivery are packed together.

#### **4.2.1 UNPACKING**

When the dispensers arrive at the installation site, the unpacked units should be inspected for possible shipping damage. If damage is evident, it must be reported to the carrier. Shipping damage is not covered under the Tokheim warranty policy.

After checking the equipment, the dispenser may be unwrapped. Cladding is packed in such a way that paint, screening and stickers are protected. Take care when unwrapping so that these elements are not damaged.

After unwrapping, the dispensers must be checked for any faults or damage. Any faults or damage found must be reported to the Installation Supervisor immediately.

Make sure that all packing materials are removed from the service station. It is recommended that you discuss this with the station's supervisor.

### **4.3 Inventory Inspection**

After unpacking and prior to installation, the delivered equipment should be inspected to ensure that all the required materials are on hand, and the dispensers have all the ordered options and markings. If discrepancies in dispenser options and markings are evident, contact Tokheim UK Ltd.

#### **4.4 Weights**

Approximate weight of an 8 hose dispenser : 660kg (maximum configuration).

**PLEASE NOTE : THE ABOVE WEIGHTS ARE APPROXIMATE AND WILL VARY ACCORDING TO OPTIONS FITTED.**

#### **4.5 Handling**

The recommended procedure for safe handling of the dispenser is by use of a forklift truck.

The installer must supply all handling equipment and ensure safe working practice at all times.



#### 4.6 Access to the Hydraulic Area

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

##### INSTRUCTIONS

- 1) Locate the keys for the hydraulic door.
- 2) Place the nozzle(s) on the ground in a safe position.
- 3) Simultaneously unlock both keylocks on the hydraulic door and carefully open the door at the top.

**Note : The door is still attached by a retaining lanyard and earth cable.**

- 4) Disconnect the retaining lanyard and earth cable from the inside of the hydraulic door.
- 5) Lift up the door to release from the slots in the drip tray and remove the hydraulic door completely.
- 6) Place the hydraulic door in a safe position.
- 7) Repeat for opposite side of dispenser as required.
- 8) To re-fit the hydraulic door(s), follow the instructions in reverse.
- 9) Close the dust caps to prevent water or dirt entering the keylock.



#### 4.7 Access the Junction Box Connections

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

##### INSTRUCTIONS

- 1) Follow the instructions given in section 4.6 to remove the hydraulic door panel on side B of the dispenser.
- 2) Locate the junction box on side B of the dispenser.
- 3) 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.
- 4) Refer to the wiring diagrams in section 5.
- 5) To re-fit the junction box cover, follow the instructions in reverse.



#### 4.8 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 keys for the calculator head door.
- 2) Simultaneously unlock both keylocks on the calculator head door on the relevant side of the dispenser
- Note : Exact position of keylocks may vary according to the model ordered.**
- 3) Carefully open the calculator head door.
- 4) Secure the calculator head door in the open position by inserting the lever into the slot provided.
- 5) Repeat for opposite side of dispenser as required.



- 6) To close the calculator head door, follow the instructions in reverse.

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



- 7) Close the dust caps to prevent water or dirt entering the keylock.

#### 4.9 Access to the Cable Glands

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

##### INSTRUCTIONS

- 1) Open the hydraulic door on the relevant side of the dispenser.
- 2) 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) Gently prise off the plastic cap cover located in the middle of the nozzle panel to access the fixing screw.
- 4) Using a 4mm allen key, loosen and remove the fixing screw in the middle of the nozzle panel and the two screws and plastic washers located at the bottom of the nozzle panel.
- 5) Carefully lift the nozzle panel upwards and away from the dispenser.

**Note : The nozzle panel is still attached by the nozzle switch(es).**



- 6) Using a 7mm spanner and 7mm nut runner, loosen and remove the nut, screw and two washers to disconnect the nozzle switch from the nozzle panel.
- 7) Remove the nozzle panel completely and place in a safe position.
- 8) To re-fit the nozzle panel, follow instructions in reverse.





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## 5 INSTALLATION

### 5.1 General

Before the dispenser can be installed, the Safety Instructions as described in Section 1.5 and the Installation Instructions in this section must be carefully read.

Follow unpacking instructions in Section 4.2.1.

After unwrapping and before installation, the dispensers must be checked for any faults or damage. Any faults or damage found must be reported to the Installation Supervisor immediately.

**NOTE: IF USING SUBMERGED PUMPS, THE CONTROL MUST BE COMPLETELY ISOLATED DURING ALL PHASES OF INSTALLATION.**

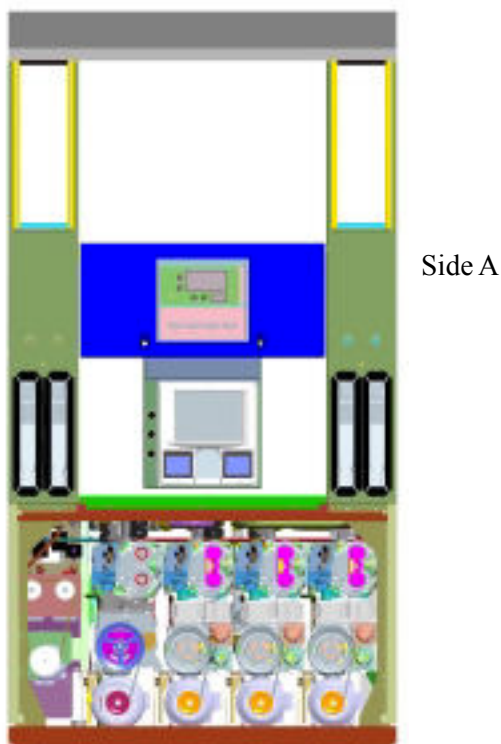
The following checks need to be made before starting the installation :-

- Check that the electric cabling and the piping arrangements have been made in accordance with the Installation drawings in section 3.
- Where applicable, check that the leakage plates have been produced in accordance with the Installation drawing. Any differences or defects should be reported to the Installation Supervisor immediately. The function of the leakage plate is to drain leakages to the outside of the dispenser where they act as a warning to the station attendant.
- Check that all flame arresters are correctly installed according to the drawings.

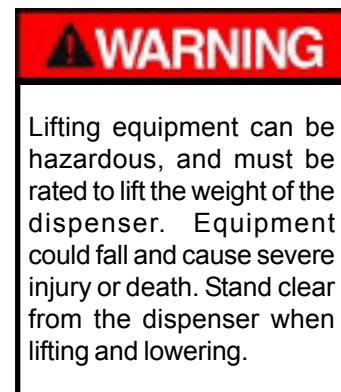
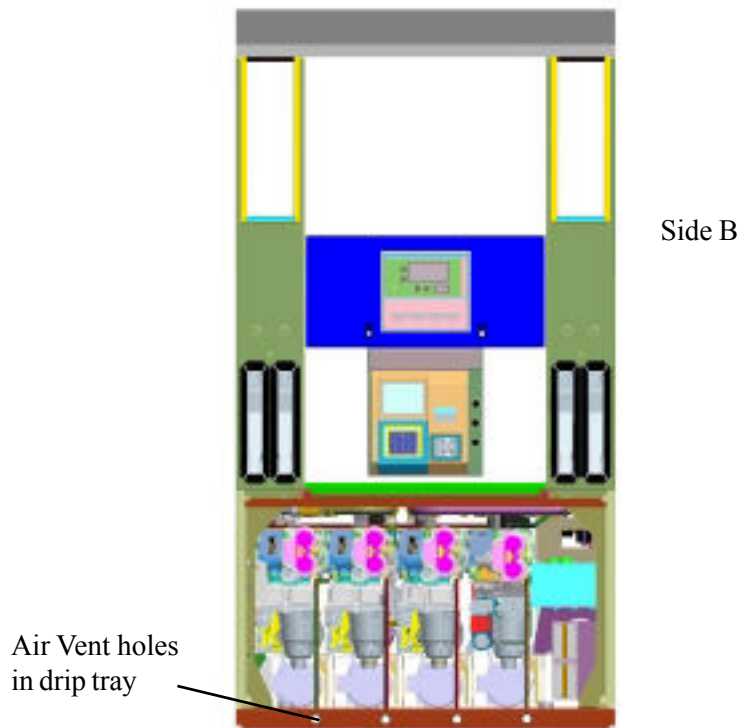
### 5.2 Identification of Sides

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

- Side A of the dispenser has no air vent holes in the drip tray. With the calculator head opened, side A has the centre plate cover.



- Side B of the dispenser has air vent holes in the drip tray at the base of the dispenser. Side B has the inlet connections and junction box, visible once the front panel is removed. With the calculator head opened, side B houses the battery and the programming of the calculator.



### 5.3 Lifting

The responsibility for carrying out the procedures described in this manual lies with the persons lifting and placing the dispenser.

The installer must supply all lifting equipment and ensure safe working practice at all times.

Q410 dispensers, excluding Q410 LC, can be lifted by forklift truck under the calculator head or by forklift slots located in the drip tray.

**IMPORTANT : Q410 LC dispensers should ONLY be lifted using the forklift slots located in the driptray. Under no circumstances should the dispensers be lifted under the calculator head.**

### 5.4 Placement

Before placement on the island can take place, the following procedures must be carried out:-

- Check that the electric cabling and piping arrangements have been made in accordance with the Installation drawing
- Check the pipes have been flushed before connecting the hydraulic components (if necessary, contact the tank installer)
- Removal of stop plugs on fuel and vapour recovery pipes
- Preparation of mounting frame
- Fitting of seals for cable, fuel and vapour recovery pipe access
- Sealing of non-used holes

## 5.4.1 BY FORKLIFT

Follow the instructions in section 4.6 to access the dispenser hydraulic area.

**PREPARE THE DISPENSER FOR LIFTING**

- 1) Use a 19mm spanner or socket to loosen and remove the four bolts (one per corner) securing the dispenser to the pallet/transport profile.

**IMPORTANT :**

Where supplied, the leak plate must be placed in the ground **PRIOR** to positioning the dispenser. Once placed, the leak plate must be sealed around the edge of the leakplate and screw holes using a suitable sealant.



- 2) **IMPORTANT :**

Protect the dispenser paint work under the calculator head using cardboard or similar non-abrasive material.



- 3) Using a block of wood or similar, carefully lift the dispenser using a forklift truck under the calculator head.

**POSITION THE DISPENSER ON THE ISLAND**

- 4) Position the dispenser over the island and feed the cables up through the electrics hole position in the drip tray.
- 5) Ensure the filter boxes are directly above the fuel supply risers then carefully lower the dispenser onto the island.



**Note : Do NOT remove the forklift at this point.**

- 6) Align the mounting holes in the dispenser drip tray with the corresponding holes in the ground.
- 7) Follow the instructions in section 5.4.3 to secure the dispenser to the ground using the two mounting holes at the opposite side to the forklift.
- 8) With one side of the dispenser secured, remove the forklift. Follow the instructions in section 5.4.3 to locate the opposite two bolts into the two remaining holes provided.



Dispenser placement is complete.

## 5.4.2 Q410 LC BY FORKLIFT

Follow the instructions in section 4.6 to access the dispenser hydraulic area.

**IMPORTANT :**

Where supplied, the leak plate must be placed in the ground **PRIOR** to positioning the dispenser. Once placed, the leak plate must be sealed around the edge of the leakplate and screw holes using a suitable sealant.

**PREPARE THE DISPENSER FOR LIFTING**

- 1) Use a 19 mm spanner or socket to loosen and remove the two nearside bolts securing the dispenser to the transport pallet.



- 2) Position the forks of a suitable forklift to the lifting slots in the drip tray.

Carefully insert the forks, stopping prior to reaching the two far side securing bolts.



***Note :** For slot dimensions, please refer to dimension drawing in Section 3.1.3 Q410 LC*

- 3) Remove the two far side securing bolts.

Insert the forks until they are visible through the far side of the drip tray.

**Do not raise the forks.**

Protect the dispenser panels with cardboard or other suitable material, then strap the dispenser to the forklift using a ratchet strap or similar to ensure stability and safety.



- 4) Raise the dispenser and carefully position it over the cradle so that the filter boxes are directly above the fuel supply risers. Lower the dispenser slowly, aligning the mounting holes on the driptray with the mounting holes on the cradle.

- 5) Follow the instructions in section 5.4.3 to secure the dispenser to the ground using the two mounting holes at the opposite side to the forklift.



- 6) With the dispenser now secure, remove the retaining ratchet straps. Ensure that the area around the dispenser is clear of all personnel, then slowly remove the forklift and move it away from the dispenser.

- 7) Follow the instructions in section 5.4.3 to secure the dispenser to the ground using the two remaining mounting holes.

- 8) Using a rust preventative fluid, such as Waxoyl professional 120-4 (Black), apply a generous coating to the inside and outside of the forklift slots.



- 9) Fit the supplied blanking plates to all 4 slots in the driptray and apply a coat of rust preventative around the 4 edges of each blanking plate.



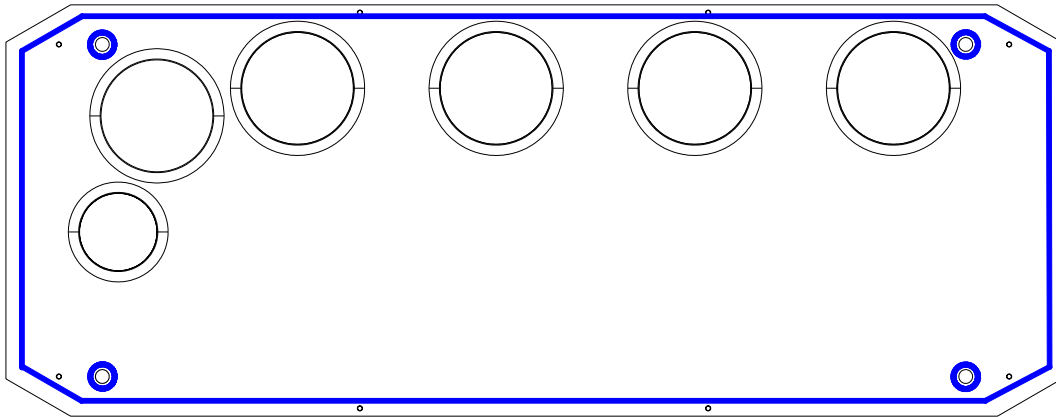
Dispenser placement is complete.



## 5.4.3 LEAK PLATE SEALING

To fulfill to ECN13617-1, it is required to apply sealant between leak-plate and island (or alternatively cradle) or between integrated drip-tray and island (or alternatively cradle) as per instruction hereafter.

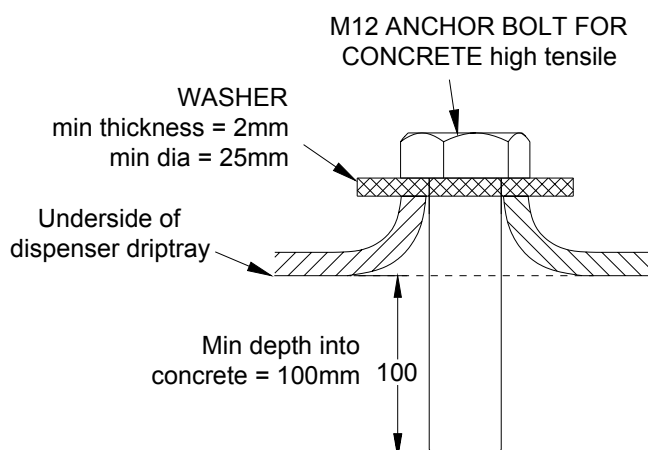
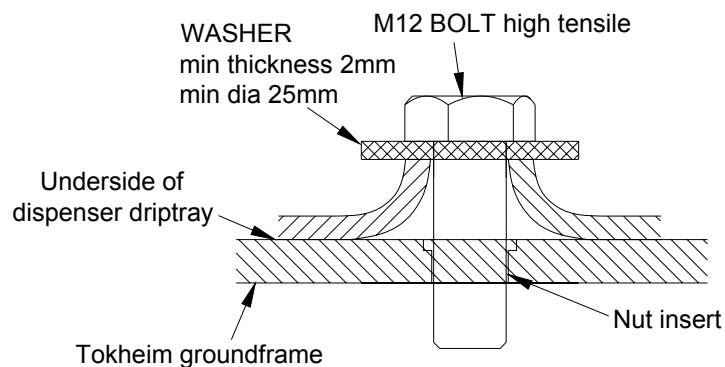
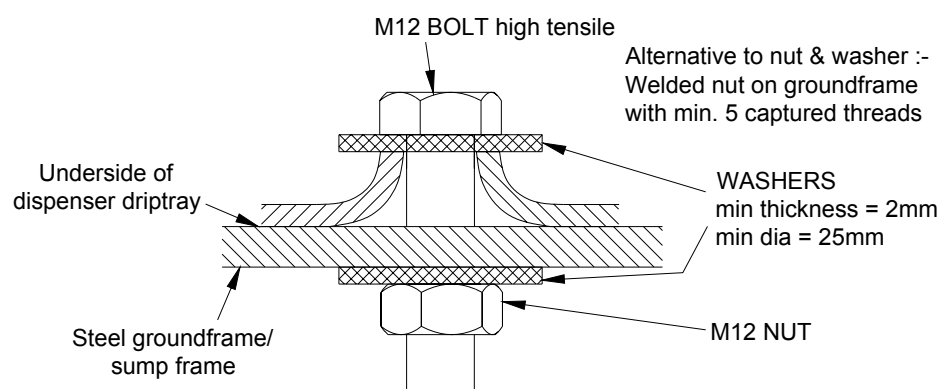
Apply suitable fuel resistant sealant on the surface of the leak-plate/integrated drip-tray, apply suitable fuel resistant sealant around fixing holes on the island as per below sketch - sealant represented by blue line.



## 5.4.4 FIXING TO GROUND

The following information relates to a typical Tokheim dispenser, unmodified by the user, with no additional advertisement boards, canopies or items added to the dispenser. Any such modifications may affect the stability and have warranty/liability consequences.

**IMPORTANT:- Tokheim dispensers must be secured to the ground using all 4 mounting positions provided in the drip tray - refer to the groundplan drawings in section 3 for mounting hole positions.**

**TYPICAL FIXING INTO CONCRETE (NO GROUNDFRAME)****TYPICAL FIXING INTO TOKHEIM GROUNDFRAME****TYPICAL FIXING INTO THIRD PARTY GROUNDFRAME / SUMP FRAME**



#### 5.4.5 EARTHING

Earthing requirements are dictated by local National regulations and must always be observed.

Tokheim recommends the following guidelines as a **minimum requirement**:-

- 6mm<sup>2</sup> earth conductor(s) back to main site earth (up to 85m cable run)
- 10mm<sup>2</sup> earth conductor(s) back to main site earth (85 to 150m cable run)

The primary earth connection point for Quantum dispensers is the M2000T Junction Box provided for installation cable connections. Threaded inserts or studs (M8) are also provided in the base frame as alternative or additional earth connection points.

Earthing requirements are dependent upon the number of earth conductors provided (one per power cable) and the types of cable used. For example, where steel wire armour cables or MICC are used in conjunction with the appropriate termination glands, no supplementary specific earth cable is likely to be required. Where simple PVC covered cables are used, Tokheim recommends an additional earth core is connected to the point provided on the dispenser base frame.

**IMPORTANT : It is the responsibility of the Installer to supply the earth wire and ensure the dispenser is safely earthed.**

The photograph below is an typical example of an earth connection point on a Q410 dispenser :-



## 5.5 Hydraulic Connections

Connect all hydraulic and electric junctions according to the specifications as described in this section and indicated on the drawings in Section 3.

Flow rates achieved are dependent upon the type of submerged pumping system used and other site-specific conditions.

Connections to the fuel supply pipes and the vapour return lines are accessible from side B of the dispenser (see section 5.2 for identification of sides).

The dispenser is positioned with the filter box positioned above the relevant fuel supply risers. If required, adapters should be fitted to the supply pipes.



**Note :** The maximum pressure must not exceed 3.5 bar.

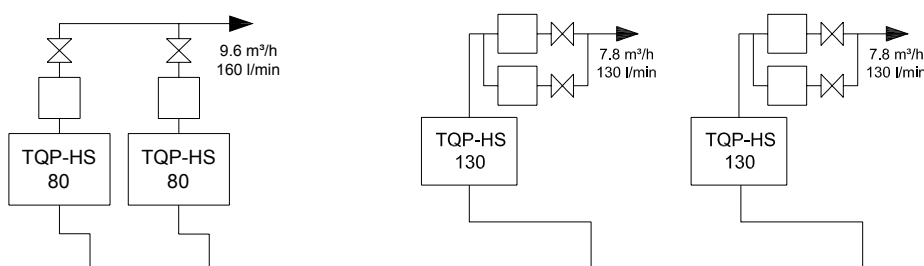
### 5.5.1 INSTALLATION OF TQP-HS PUMPS



#### IMPORTANT INFORMATION:

**DO NOT INSTALL TQP-HS PUMPS, 80 OR 130 LPM, IN SERIES ON THE SAME SUCTION LINE.**

**SEPARATE SUCTION LINES ARE REQUIRED, AS EXAMPLES SHOW BELOW:**



### 5.5.2 PIPEWORK - DISPENSERS WITH DIRECT CONNECTION (SUCTION OR SUBMERGED)

The Installer is responsible for supplying the riser pipe to the heights given in section 2.3 and all pipework and connections below the filter box connection.

#### EXTERNAL FILTER BOX ONLY (SUCTION PUMPS OR SUBMERGED)

- 1) The dispenser must be positioned directly above the riser pipes and carefully lowered into position.
- 2) Remove the protective covers on the fuel supply riser pipe and on the filter box.



**WARNING : BEWARE OF FUEL SPILLAGE.**



- 3) Cut the rubber manchet to suit the riser pipe diameter and fit over the pipe to cover the hole in the drip tray.
- 4) Connect the fuel supply pipe to the filter box or optional flange (where fitted).
- 5) Repeat for each hydraulic position as required.



### 5.5.3 PIPEWORK - DISPENSERS WITH FLEXIBLE CONNECTION (SUCTION ONLY)

The Installer is responsible for supplying the riser pipe to the heights given in section 2.3. The flexible connection should then be fitted between the fuel supply risers and the filter box.

#### SUCTION PUMPS WITH EXTERNAL FILTER BOX ONLY

- 1) Remove the protective covers on the fuel supply riser pipe and on the filter box.



**WARNING : BEWARE OF FUEL SPILLAGE.**



- 2) Cut the rubber manchet to suit the riser pipe diameter and fit over the pipe to cover the hole in the drip tray.
- 3) Apply a sealant compound to the fuel supply riser and to the inside of the flexible coupling.



- 4) Fit the flexible coupling to the fuel supply riser pipe.

**Note : Hand tighten only at this point**



- 5) Insert the top hat filter (provided in the installation kit) into the flexible coupling.
- 6) Manoeuvre the flexible coupling into the correct position, ready for securing to the filter box.



- 7) Insert the gasket between the filter box and the flange on the flexible coupling.



- 8) Fit the flange to the filter box using the two screws provided in the installation kit.

**Note : Hand tighten only at this point.**



- 9) Use a large adjustable spanner to tighten and secure the flexible connection to the fuel supply riser pipe.



- 10) Using a 15mm spanner or socket, tighten the two screws on the flange.



- 11) Repeat steps 1 to 10 for each hydraulic position as required.

#### **TQP-RS PUMPS WITH INTERNAL FILTER ONLY**

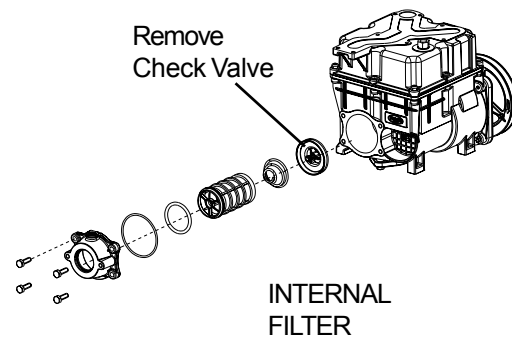
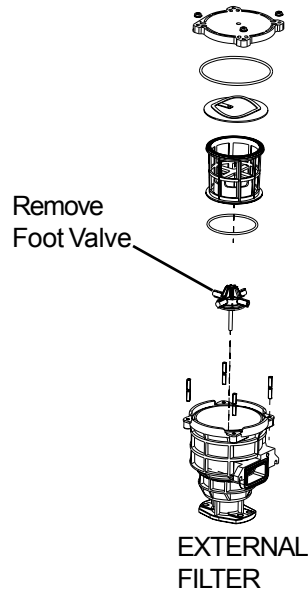
- 1) If the riser pipe is not 1.5" diameter male thread then an adaptor will need to be fitted by the Installer.
- 2) Fit the female end of the flexible connection to the male thread on the fuel supply pipe in the ground and tighten using a large adjustable spanner.
- 3) Where fitted, remove the hygiene cover on the inlet connection on the pump.
- 4) Using a 13mm spanner, fit the two bolts on the flange to secure the flexible connection to the pump.
- 5) Repeat steps 1 to 4 for each hydraulic position.



#### 5.5.4 FITTING A RISBRIDGER CHECK VALVE

If a Risbridger Check Valve has to be fitted to a dispenser :

- remove the check valve - for pumps with internal filters
- remove the foot valve - for pumps with external filters



#### 5.5.5 SPIN ON FILTER (OPTION)

The installer is responsible for ensuring the following procedures are carried out correctly, using the recommended Wix 24027 filter.

- 1) Within the hydraulics section, locate the spin on filter housing and ensure all valves are in the closed position. (Horizontal)



- 2) Remove the filter from its packaging and apply a film of oil around the gasket.



- 3) Carefully place it in the housing and begin to tighten by hand until the gasket has made contact. Apply another 3/4 of a turn.

**Note : Do not over tighten the filter.**



- 4) When the filter is firmly in place, turn the ball valve to the open position. (Vertical). The procedure is now complete.

**Note :** Ensure that the line is subsequently bled to release any air in the sytem.



#### 5.5.6 PIPEWORK - VR

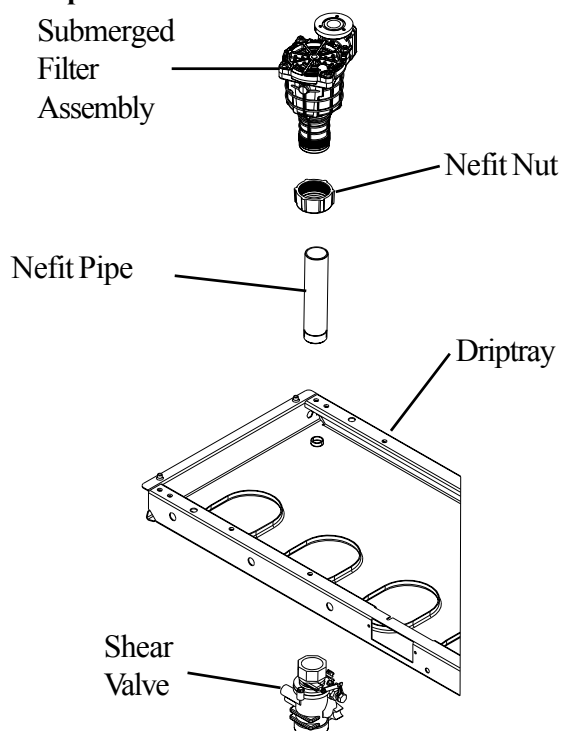
The Installer is responsible for supplying the VR pipe to the heights given in section 2.3.

- 1) Fit the VR flange and gasket to the VR pipe.
- 2) As required, fit optional flame arrestor, quick connector and/or shear valve kits to the VR pipe flange, sealing with gaskets, o-rings, dowty seals and washers as supplied.
- 3) Ensure that the VR flexi pipes are not put under strain, trapped or twisted then connect VR flexi pipe to the VR pipe.

#### 5.5.7 NEW SUBMERGED INSTALLATION

Depending on the dispenser an additional plate at the end of the hydraulic cabinet to balance the dispenser during installation may be required. This is fitted in production on specific configurations only, it is left in place once the dispenser is installed.

##### Description of Parts







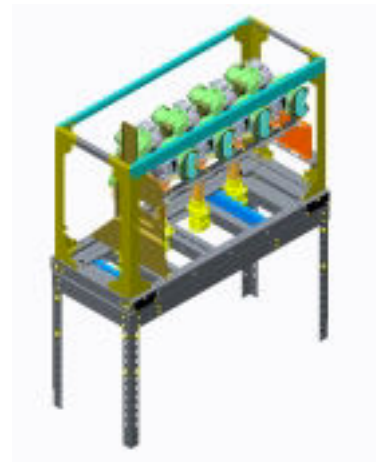
**WARNING : BELOW INSTALLATION PROCEDURE MUST BE STRICTLY FOLLOWED WITH THE NEW SUBMERGED.**

- 1) Ensure that the nefit pipe is fully inserted inside the filter pot.



- 2) Lower the dispenser until it sits on the groundframe.

*Note: no risk that the nefit pipes will collide with the shear valves as it is inserted deep enough inside the filter pots*



- 3) Untighten the Nefit nut.
- 4) Slide down the Nefit pipe.
- 5) Screw the Nefit pipe into the Shear valve.
- 6) Tighten the Nefit nut.



## 5.6 Electrical Connections

During installation, the main switch must be switched off - ensure the main switch cannot be switched on inadvertently.

The installation of the cables must be carried out carefully to ensure the Eex-norm is enforced (insertion of cables via glands).

The electrical connections are compatible with all European installation practices and typical country specific cable types. The following information is the Tokheim recommended installation, however where differences exist in the standards relating to installation according to country specific legislation, the local/national standards must be employed.

### CABLING

The type of cabling used will differ by country according to local and/or national laws and regulations. The drawings in this section show the minimum number of cores required in cables and the minimum core cross sectional area. Cables with more than the minimum can be used provided that the cables are suitable for use with the cable gland sizes fitted. Individual cables can be combined provided that the minimum number of conductors remains.

The maximum number of forecourt cables required will be :-

- One power cable for motor power supply
- One power cable for calculator supply
- One/two cable(s) for dispenser communications
- One cable for speaker (optional)
- One ethernet CAT5 cable per side for OPT communications (optional)
- One cable per submerged pump control signals (where applicable)

### ELECTRONICS AND LIGHTING PROTECTION

Tokheim recommends a 2-pole thermal-magnetic device for protection of the metering pump electronics. A fuse must **NOT** be used in the neutral conductor. Thermal-magnetic Breakers or fuses must be capable of extinguishing a fault current of at least 4000A.

*Note : Provision for lighting supply is not required as LED backlighting is standard.*

### MOTOR WIRING

The number of motors per dispenser will vary according to different models and options. Always connect to the furthest left terminal first. Jumper sizes and positions will vary according to the number of motors.

#### 5.6.1 JUNCTION BOX WIRING

During the removal or replacement of the M2000 Junction Box cover, the machined flame path of the cover and the junction box should be inspected for damage. If any defects or scratches are found then the junction box and/or cover must be replaced - this is essential for product safety. Once removed, always store the cover in a safe place.

**Note : The correct tightening torque for the junction box cover is 18Nm.**



Three different sizes of cable gland entries are available from Tokheim for the M2000T Junction Box:-

- For cable sizes 6-11mm
- For cables sizes 10-13mm
- For cable sizes 14-17mm

Ensure that the correct gland size is chosen to suit each installation cable. Failure to do so will compromise product safety.

The special requirements relating to the use of the M2000T Junction box are:-

- Gland size 6-11mm must be tightened to a torque of 114Nm
- Gland size 10-13mm must be tightened to a torque of 35Nm
- Gland size 14-17mm must be tightened to a torque of 70Nm
- Ensure that all cables terminating in the M2000T Junction Box are securely fastened to the dispenser frame adjacent to the box.

The wiring in the main junction box will vary according to different models and options. The drawings in this section show the Tokheim recommended installation but differences may exist in the standards relating to installation in different countries and local regions, in which case the local and/or national standards must be employed.

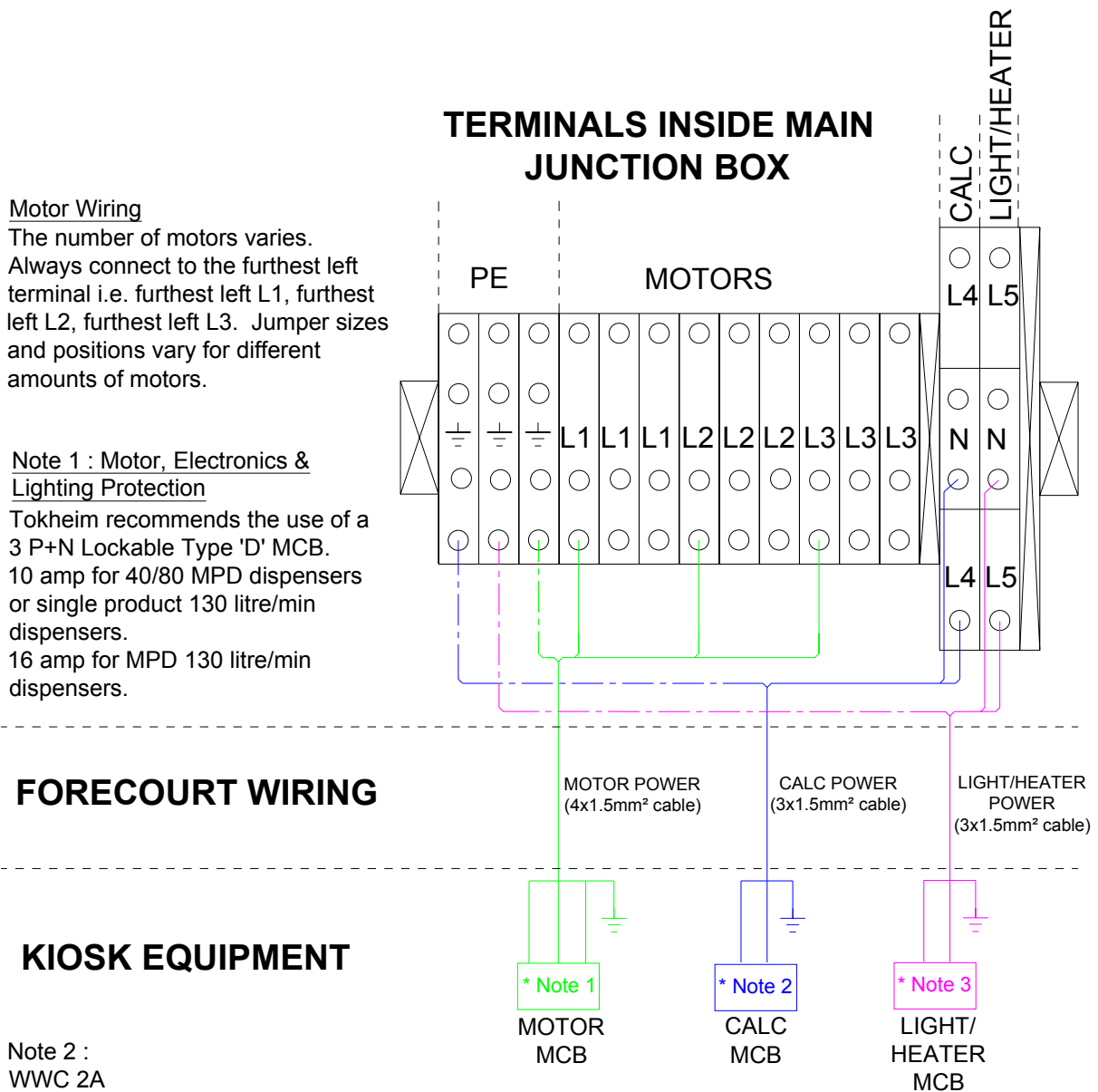
**Three Phase Suction**

**Motor Wiring**

The number of motors varies.  
Always connect to the furthest left terminal i.e. furthest left L1, furthest left L2, furthest left L3. Jumper sizes and positions vary for different amounts of motors.

**Note 1 : Motor, Electronics & Lighting Protection**

Tokheim recommends the use of a 3 P+N Lockable Type 'D' MCB.  
10 amp for 40/80 MPD dispensers or single product 130 litre/min dispensers.  
16 amp for MPD 130 litre/min dispensers.



**KIOSK EQUIPMENT**

Note 2 :  
WWC 2A  
TQC 6A  
TQC-VGA 6A

Note 3 :  
LIGHT 8A  
HEATER 8A

*Note : The Lighting Supply cable is only required for models with the option Illuminated Product Indication (IPI). Dispenser models with standard LED backlighting only do not require this installation cable.*

Single Phase SuctionMotor Wiring

The number of motors varies. Always connect to the furthest left terminal i.e. furthest left L1. Jumper sizes and positions vary for different amounts of motors.

Note 1 : Motor, Electronics & Lighting Protection

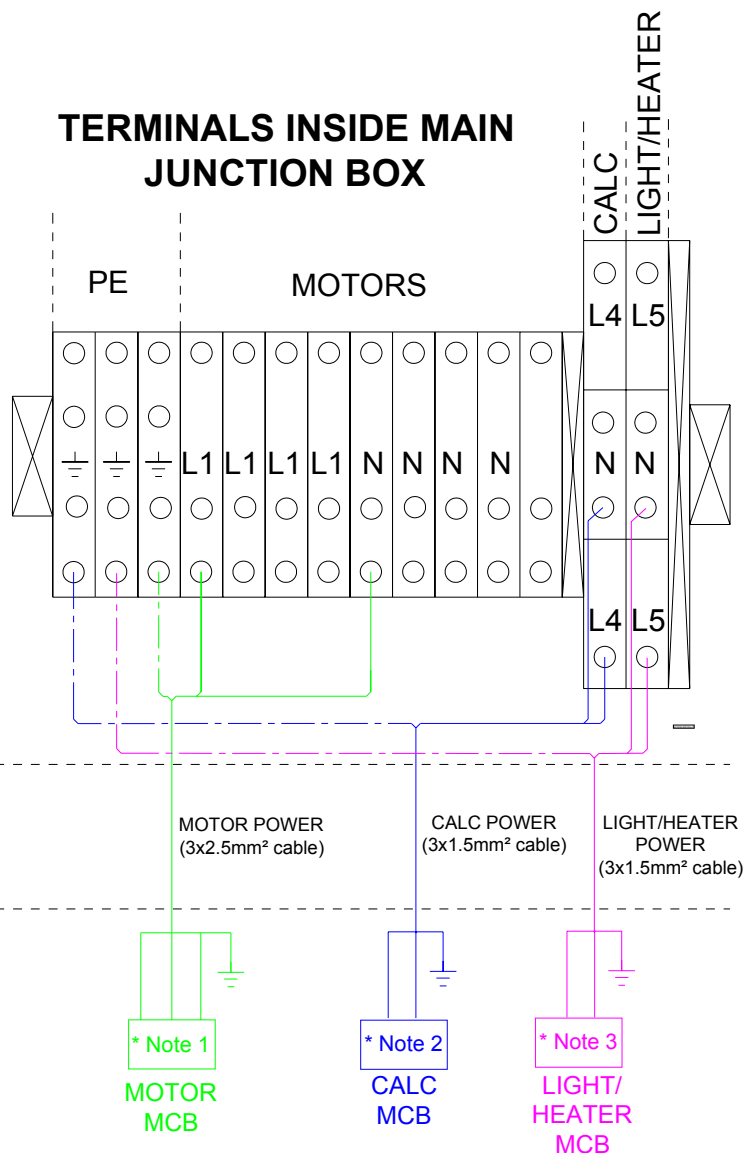
Tokheim recommends the use of a 2 P Lockable Type 'D' MCB.  
16 amp for all single product dispensers and 2 product 40/80 dispensers.  
20 amp for all other MPD (single product implies one riser position).

**FORECOURT WIRING****KIOSK EQUIPMENT**Single Phase Alternative

Calculator & Lighting may share a common supply cable and link L4 to L5, N4 to N5.

Note 2 :  
WWC 2A  
TQC 6A  
TQC-VGA 6A

Note 3 :  
LIGHT 8A  
HEATER 8A

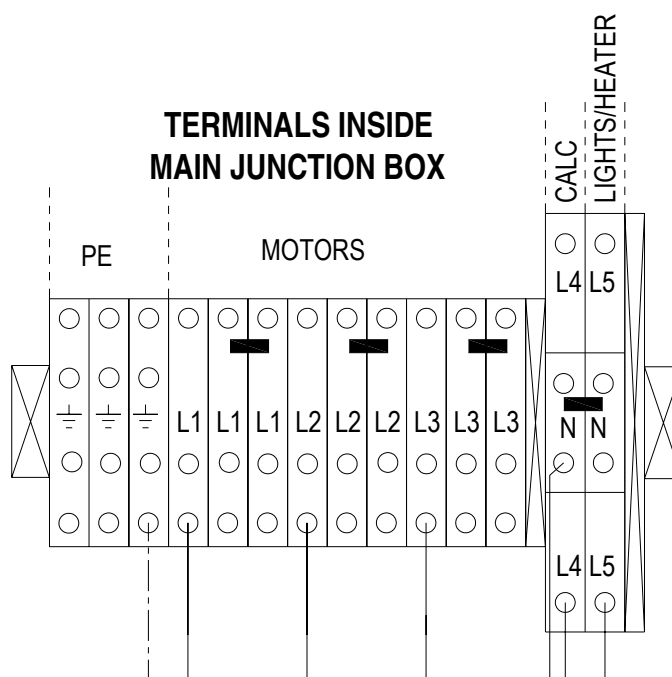


**Three Phase Suction Alternative**

Note 1 : Motor, Electronics & Lighting Protection

Tokheim recommends the use of a 3 P+N, Lockable Type 'D' MCB.  
6 amp for submerged pumps.  
10 amp for 40/80 MPD pumps or single product 130l/min pumps.  
16 amp for MPD 130l/min pumps.

Installation with a 5 core MCCC cable is possible by linking L3 to L4 and L5 within the dispenser mains box.



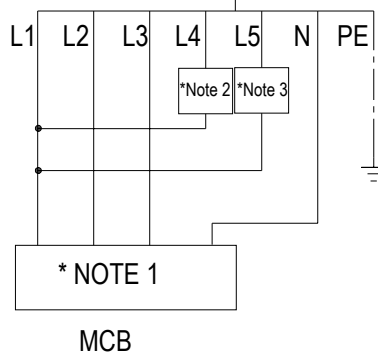
**FORECOURT WIRING**

MOTOR, CALCULATOR & LIGHT/HEATER POWER  
(7x1.5mm<sup>2</sup> cable)

**KIOSK EQUIPMENT**

Note 2 :  
WWC 2A  
TQC 6A  
TQC-VGA 6A

Note 3 :  
LIGHT 8A  
HEATER 8A

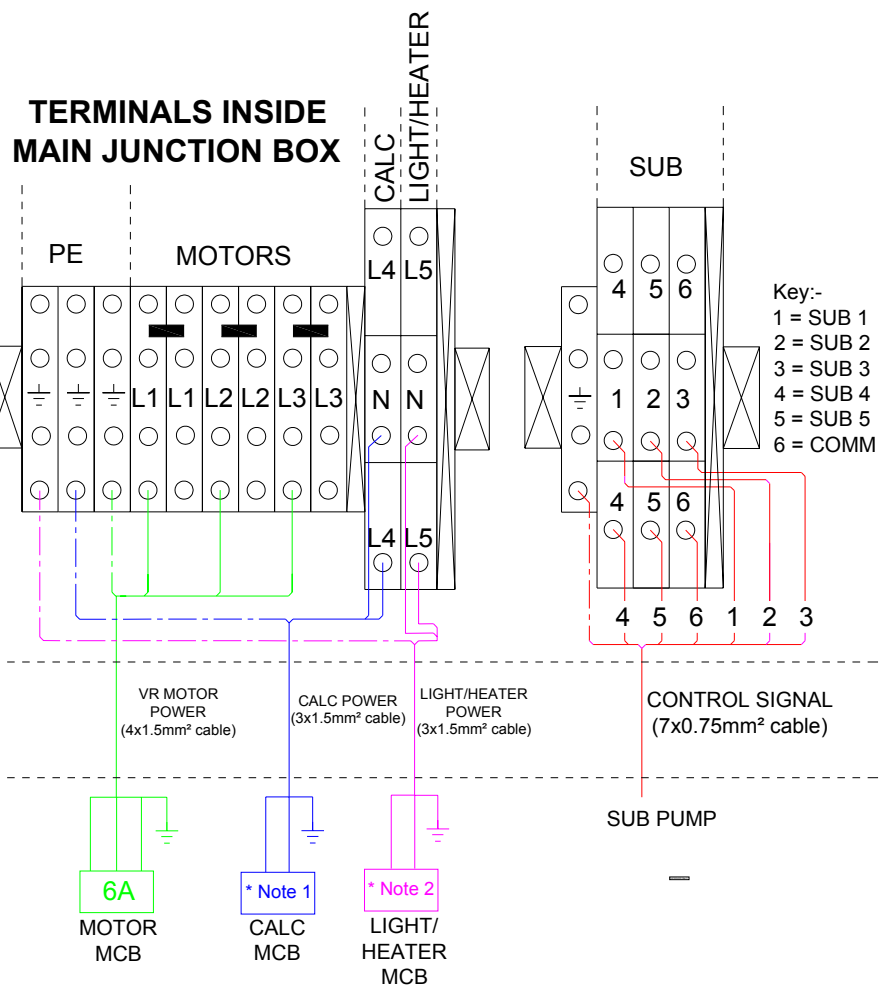


**Submerged****Motor Wiring**

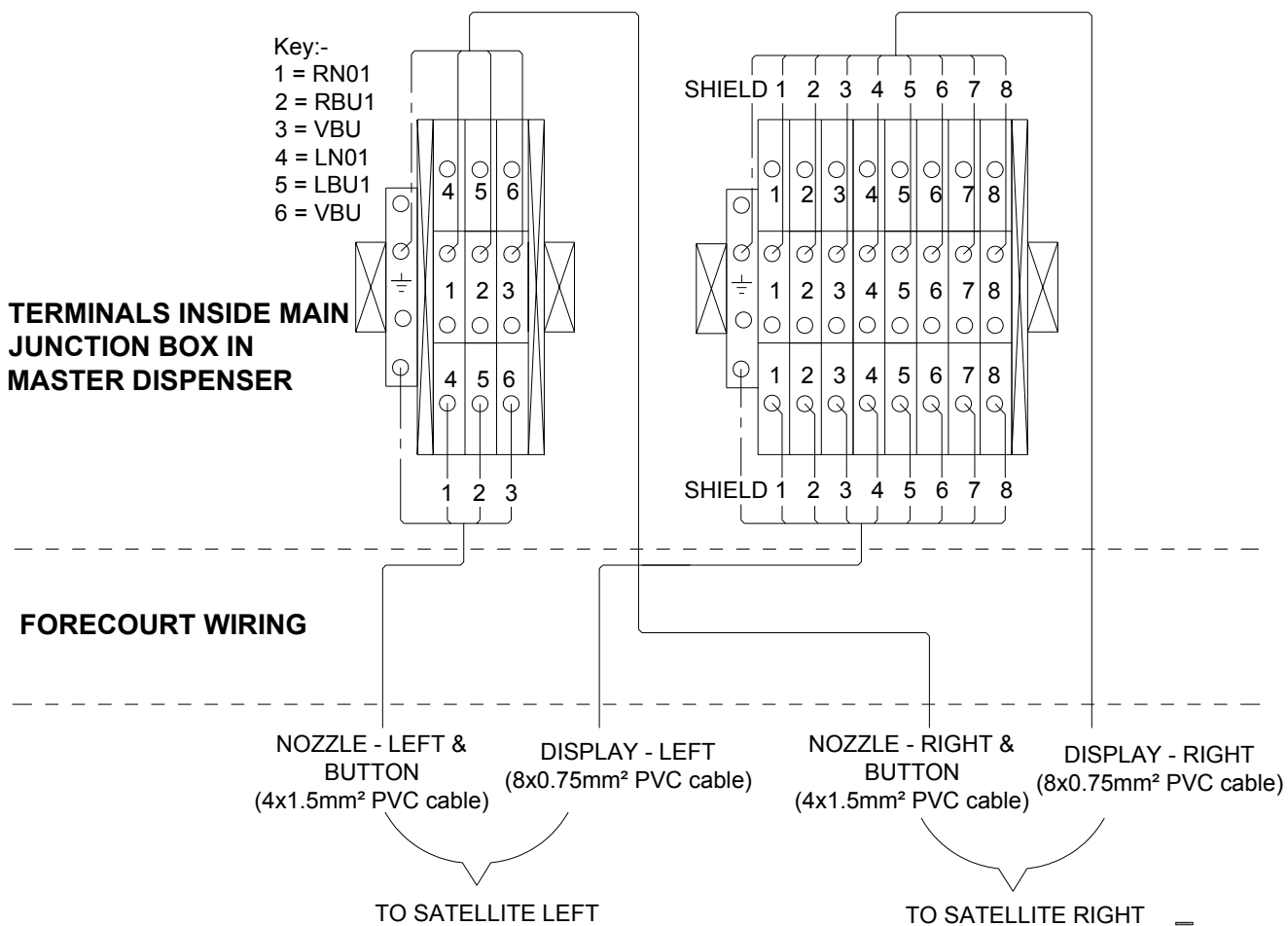
The number of motors varies.  
Always connect to the furthest left terminal i.e. furthest left L1, furthest left L2, furthest left L3 etc. Jumper sizes and positions vary for different amounts of motors.

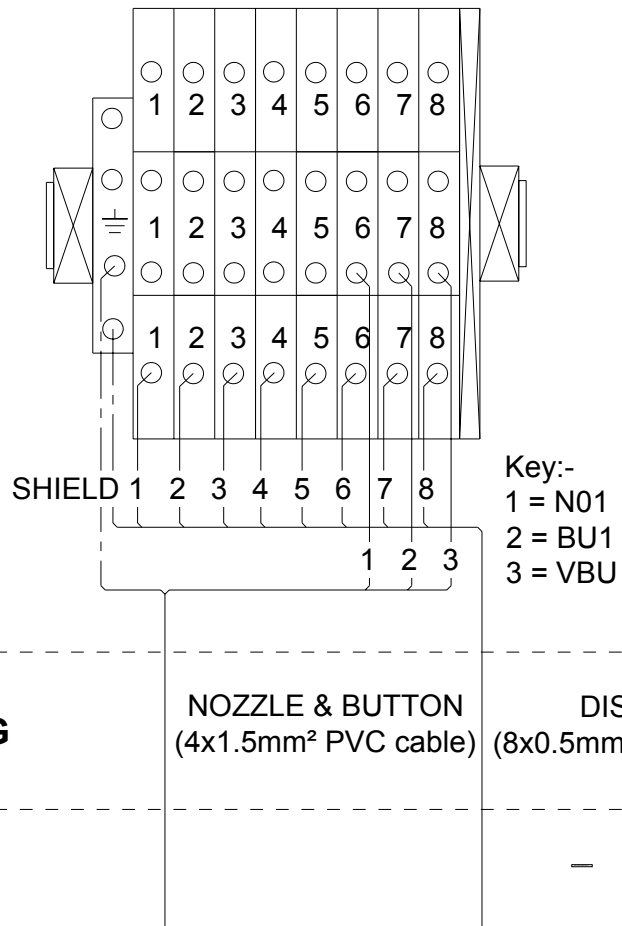
**Motor, Electronics & Lighting Protection**

Tokheim recommends the use of a 3 P+N Lockable Type 'D' MCB.  
10 amp for 40/80 MPD dispensers or single product 130 litre/min dispensers.  
16 amp for MPD 130 litre/min dispensers.

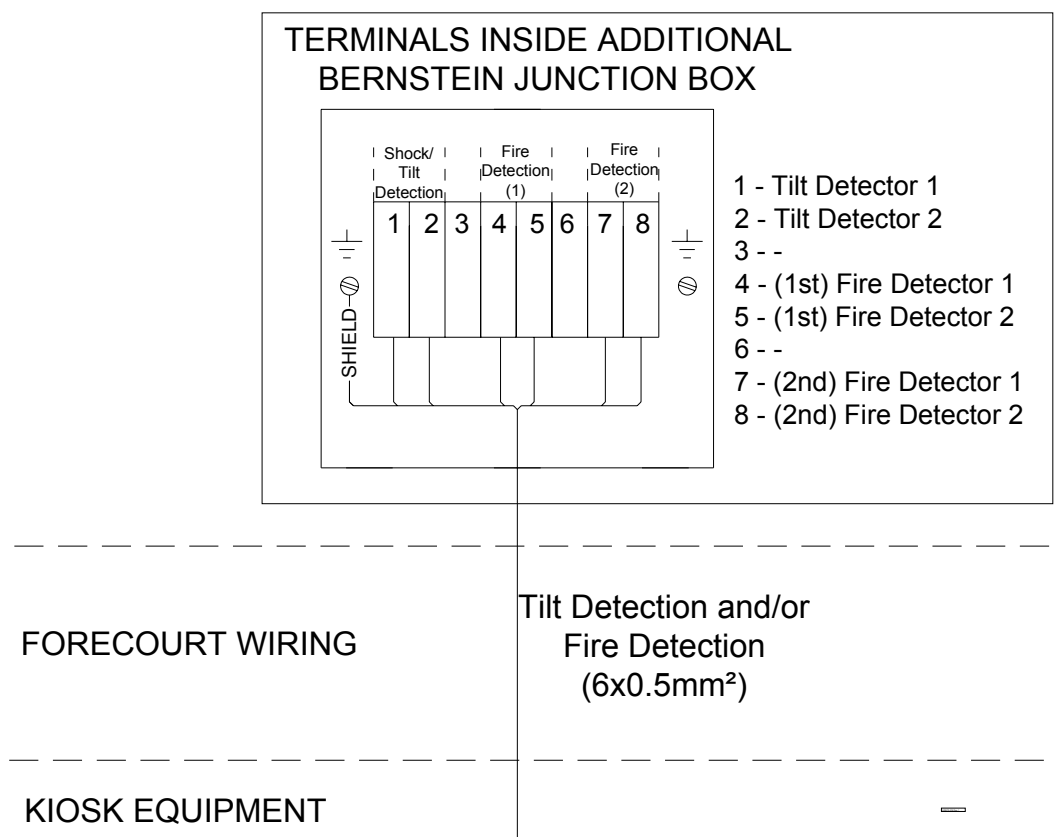


Master for Satellite

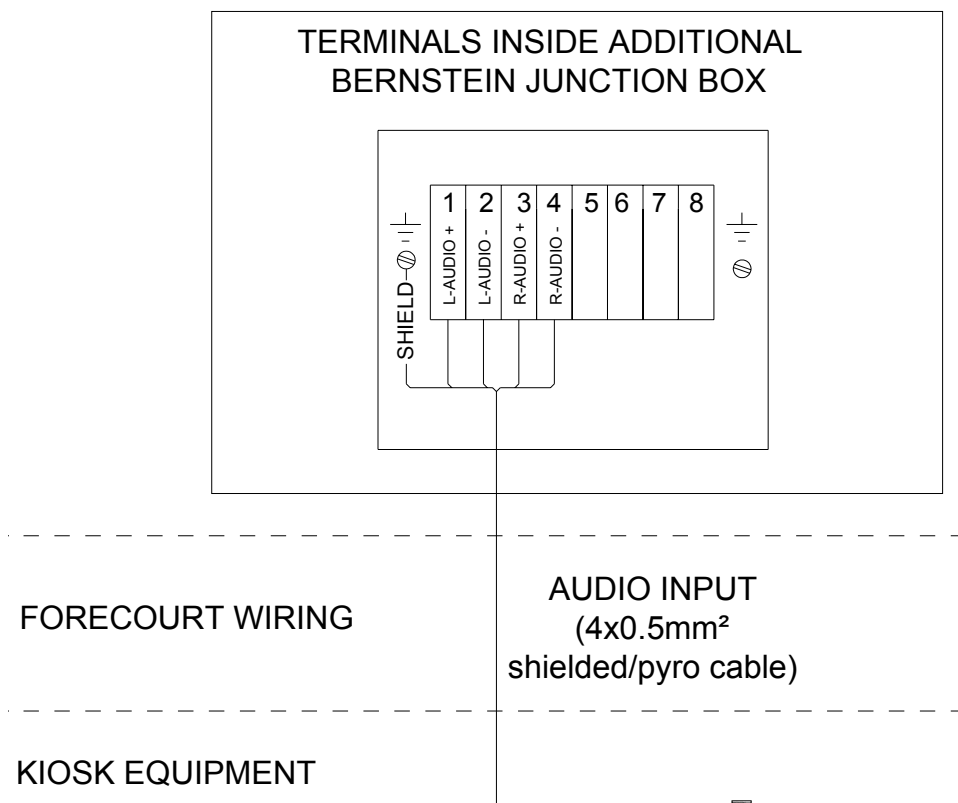


Satellite**TERMINALS INSIDE  
MAIN JUNCTION  
BOX IN SATELLITE**

**Fire & Tilt Detection (in additional Junction Box)**



**Audio Option (in additional Junction Box)**



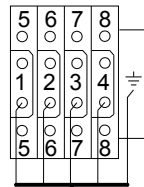


## 5.6.2 COMMUNICATIONS WIRING IN MAIN JUNCTION BOX

Communications wiring in the main junction box will vary according to the different communication protocols.

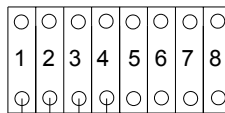
UP TO FOUR TERMINAL COMMS

Post Oct 2006  
(up to 4 terminals)



Installation cable

Pre-Oct 2006  
(up to 4 terminals)

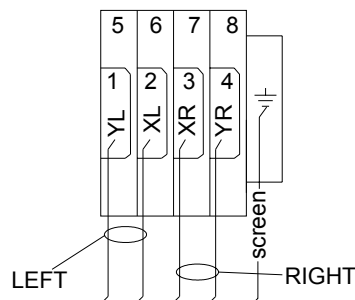


Installation cable

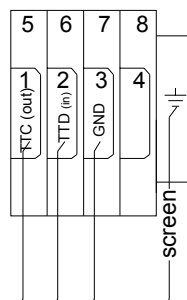
**IMPORTANT**

Screen and unused wires must be cut as close as possible to cable glands

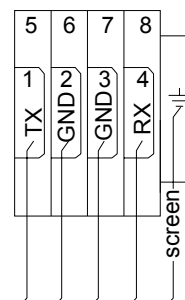
Ensure wiring in dispenser matches wiring in kiosk

**KIENZLE**

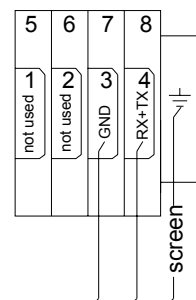
4 core  
screened cable

**TOK**

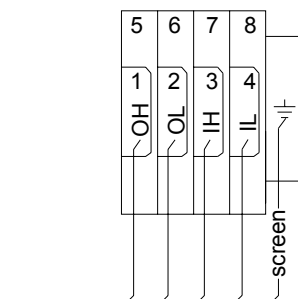
3 core  
screened cable

**EIN**

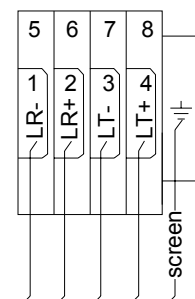
4 core  
screened cable

**82D**

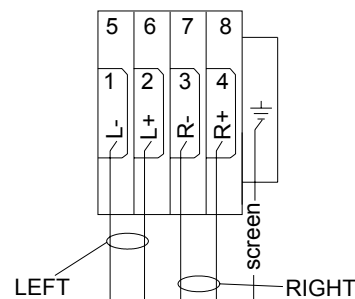
2 core  
screened cable

**AUTOTANK**

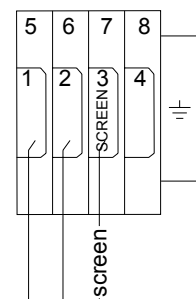
4 core  
screened cable

**DRESSER**

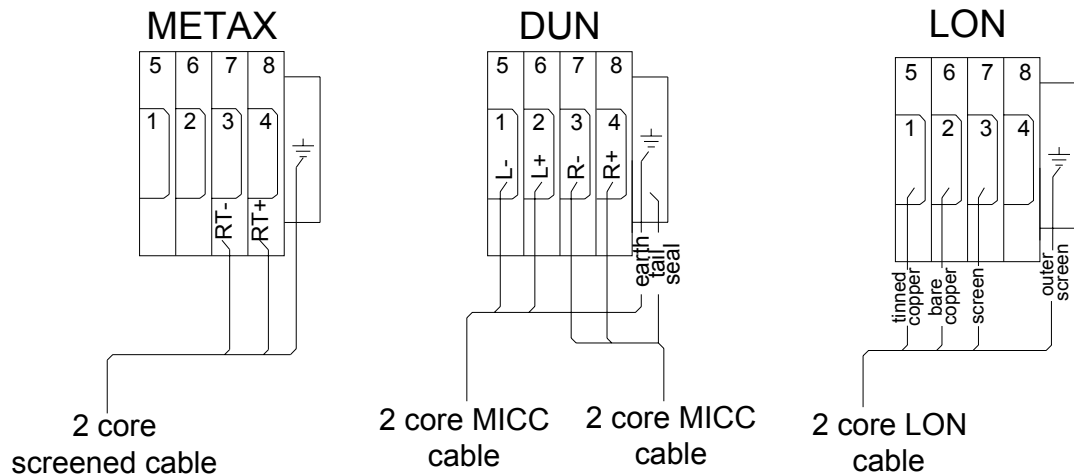
4 core  
screened cable

**ZSR**

4 core  
screened cable

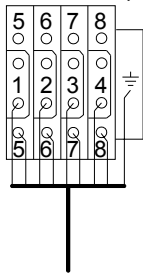
**M32**

2 core  
screened cable



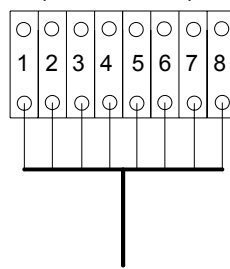
### EIGHT TERMINAL COMMS

Post Oct 2006  
(8 terminals)



Installation cable

Pre-Oct 2006  
(8 terminals)

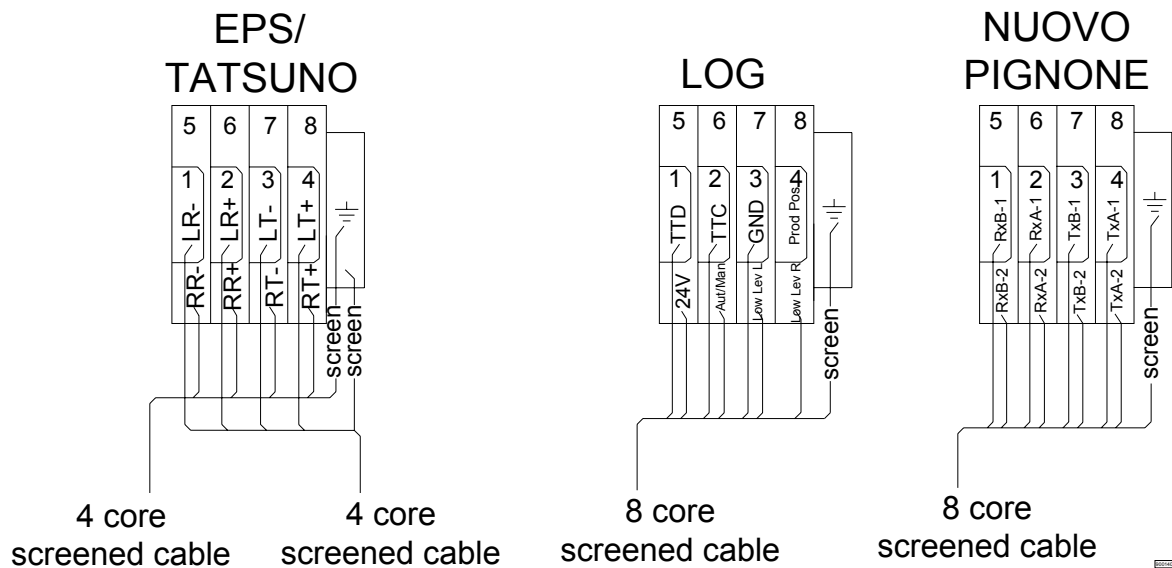


Installation cable

### IMPORTANT

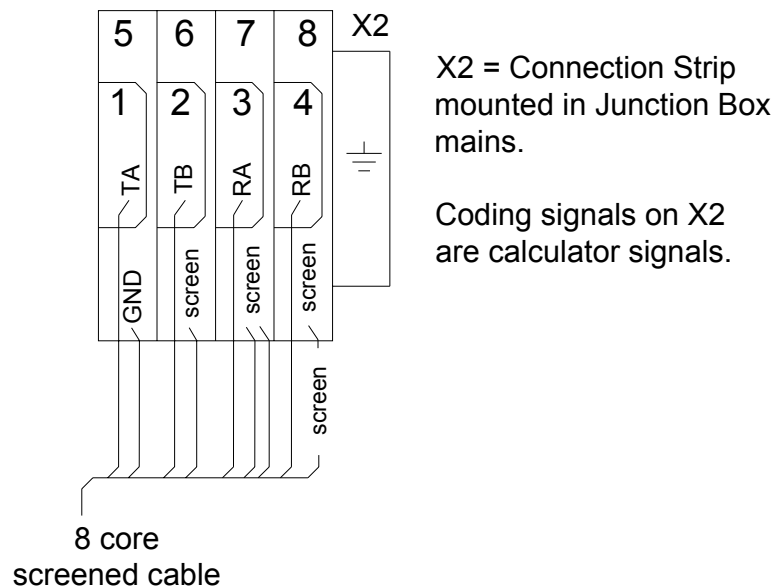
Screen and unused wires must be cut as close as possible to cable glands

Ensure wiring in dispenser matches wiring in kiosk



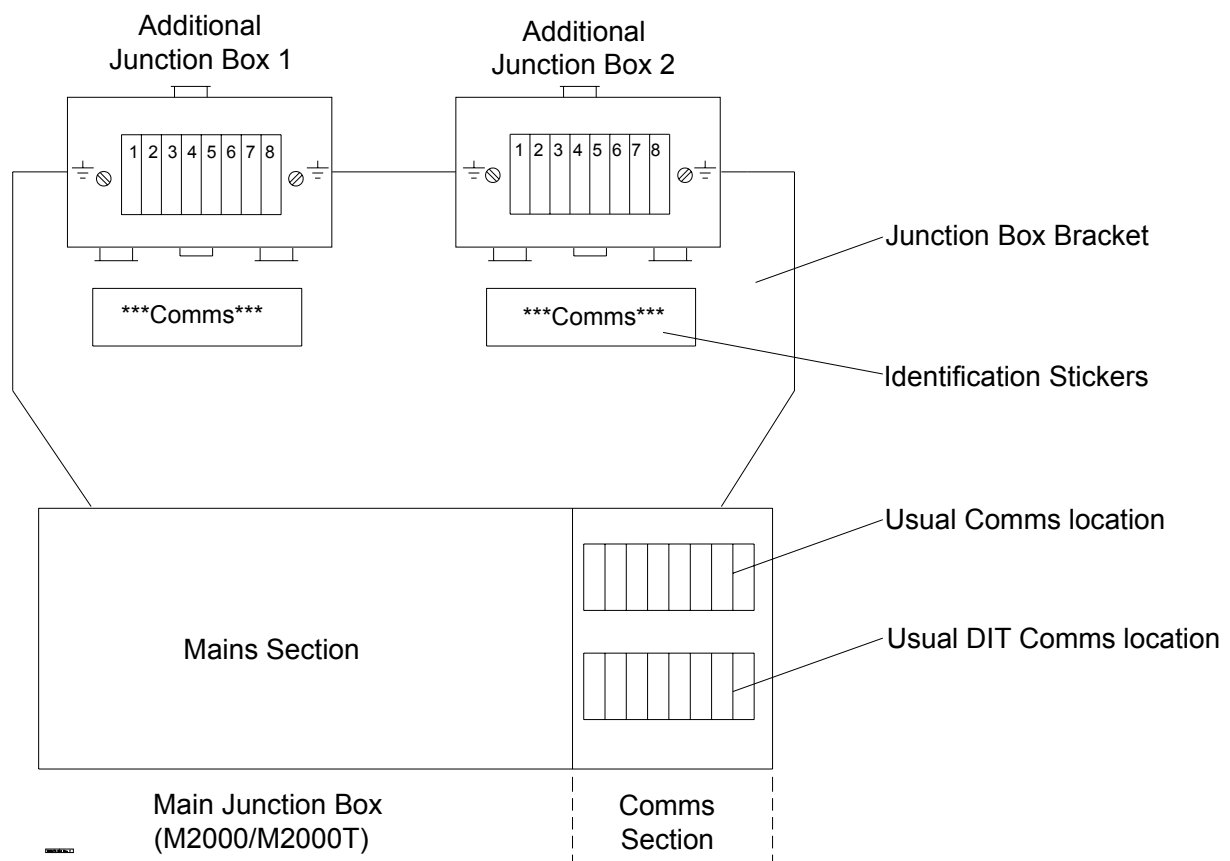
EPSI INTERFACE

## EPSI INTERFACE



## 5.6.3 SPECIAL DISPENSER CONFIGURATIONS

With certain combinations of options, additional junction boxes may be required.



- Audio option - if the dispenser is fitted with speakers then the audio connections are always housed in Junction Box 1.
- Shock Detection option - if the dispenser is fitted with shock detection then the unit is housed in the Comms section of the Main Junction Box and the dispenser communications are housed as follows:-

Option Combination	Main Junction Box	Additional Junction Box 1	Additional Junction Box 2
Fire/Tilt Detection, non-EPS Comms & DIT	Fire/Tilt Detection, non-EPS Comms & DIT	None	None
Fire/Tilt Detection, EPS Comms & DIT	Fire/Tilt Detection & EPS Comms	DIT Comms	None
Fire/Tilt Detection, EPS Comms, DIT & Audio	Fire/Tilt Detection & EPS Comms	Audio	DIT Comms

- High Speed Single Phase Motors - if the dispenser is fitted with high speed single phase motors then the motor capacitors are housed in the Comms section of the Main Junction Box and the dispenser communications are housed as follows:-

Option Combination	Main Junction Box	Additional Junction Box 1	Additional Junction Box 2
High Speed 1ph motor	Motor Capacitors	Dispenser Comms	None
High Speed 1ph motor & DIT	Motor Capacitors	Dispenser Comms	DIT Comms
High Speed 1ph motor & Audio	Motor Capacitors	Audio	Dispenser Comms
High Speed 1ph motor, DIT & Audio	Not an option	Not an option	Not an option

## 5.6.4 OUTDOOR PAYMENT TERMINALS AND VIDUIM POWER



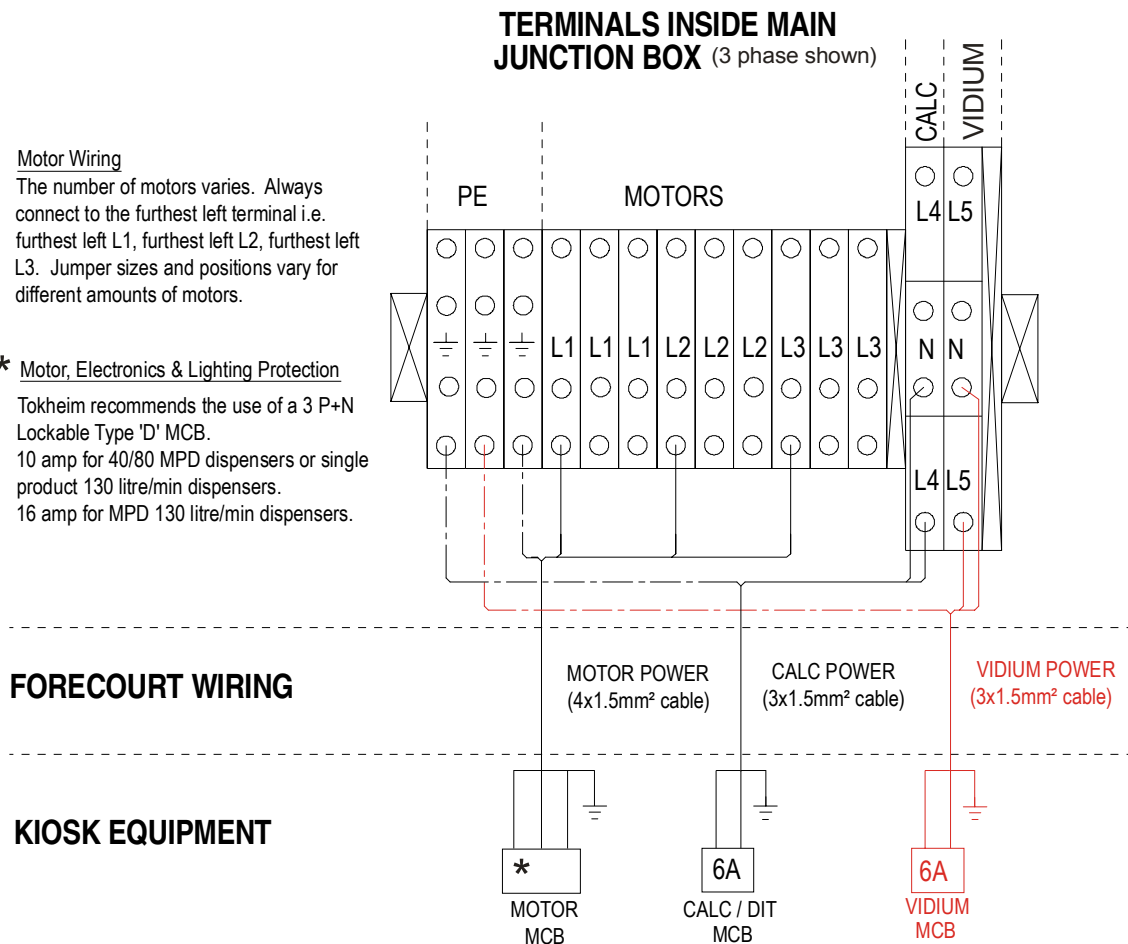
**Note :** A separate power cable must be supplied from the kiosk to the dispenser for Vidium equipped models.

#### Motor Wiring

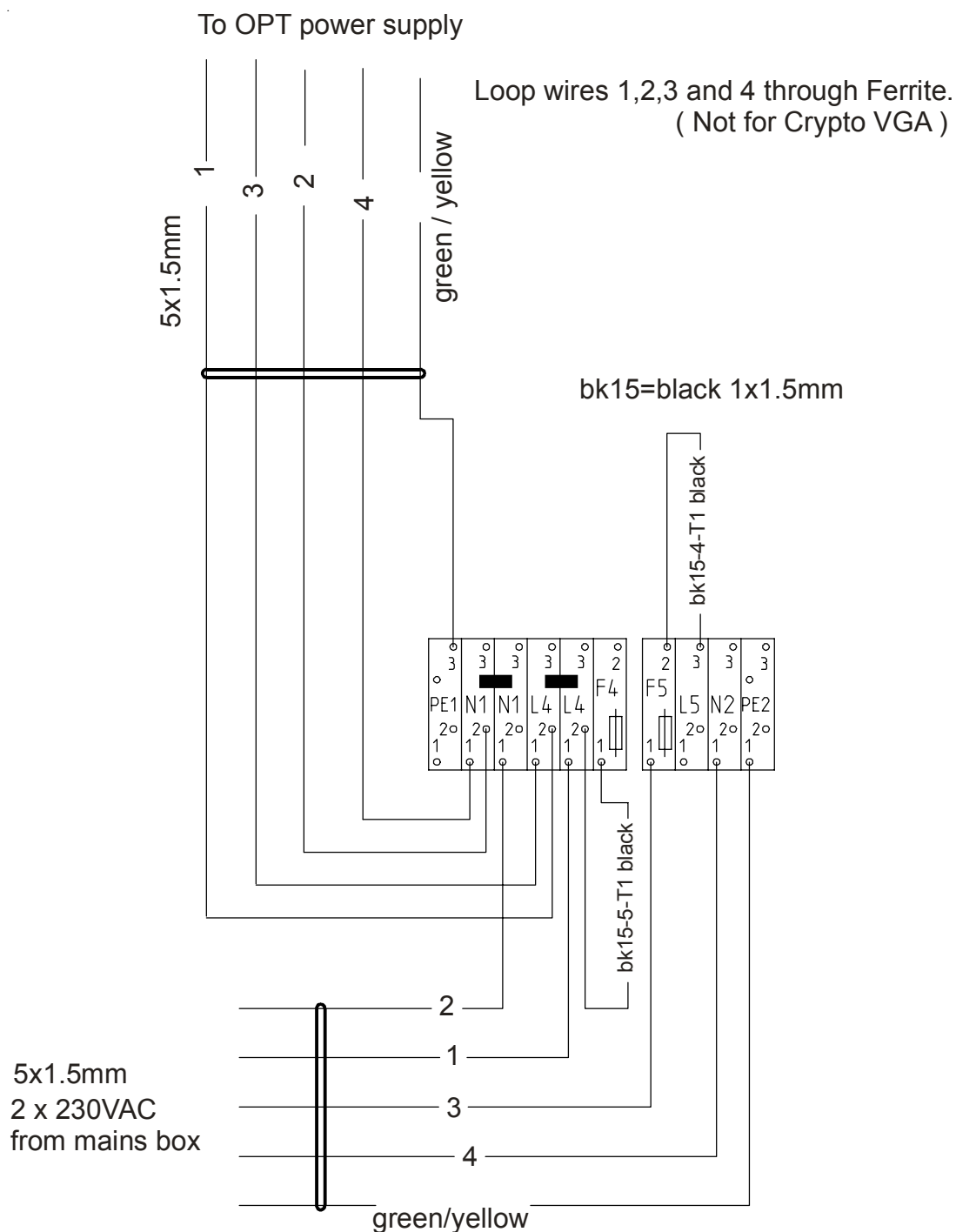
The number of motors varies. Always connect to the furthest left terminal i.e. furthest left L1, furthest left L2, furthest left L3. Jumper sizes and positions vary for different amounts of motors.

#### \* Motor, Electronics & Lighting Protection

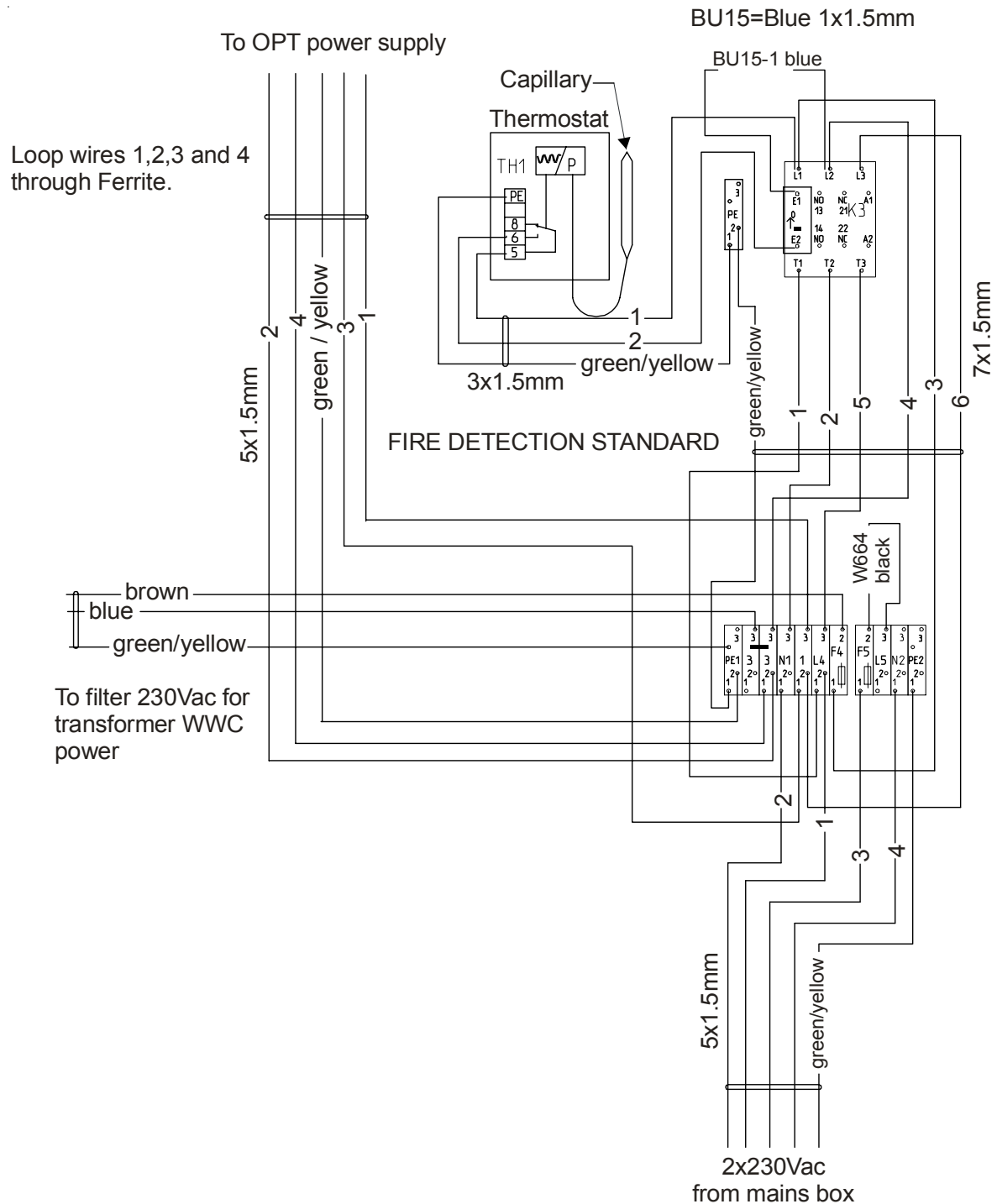
Tokheim recommends the use of a 3 P+N Lockable Type 'D' MCB.  
10 amp for 40/80 MPD dispensers or single product 130 litre/min dispensers.  
16 amp for MPD 130 litre/min dispensers.



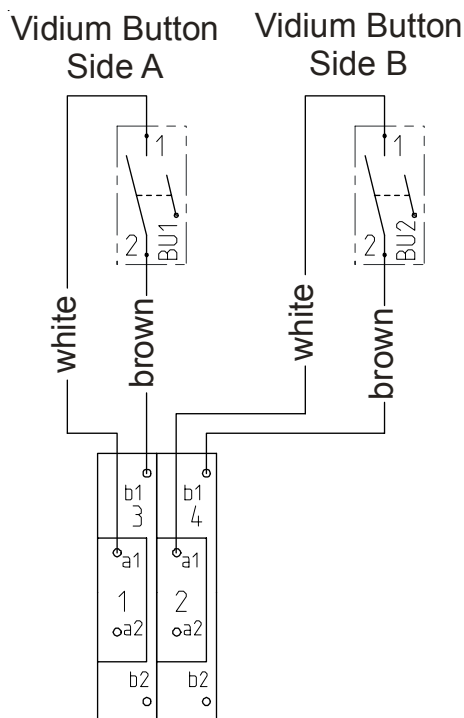
OPT Power Supply 230V connection



### 230V OPT with Fire Detection

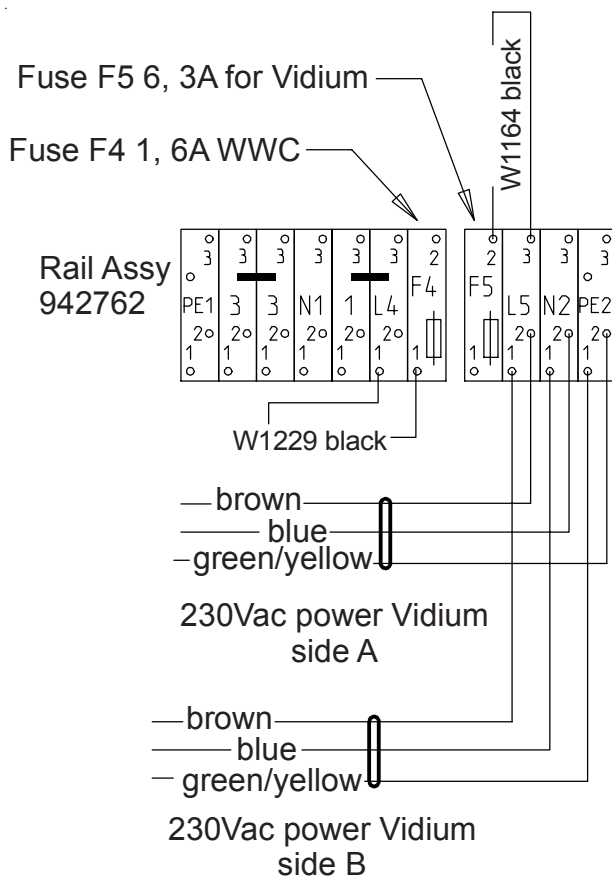


### Vidium Audio Button

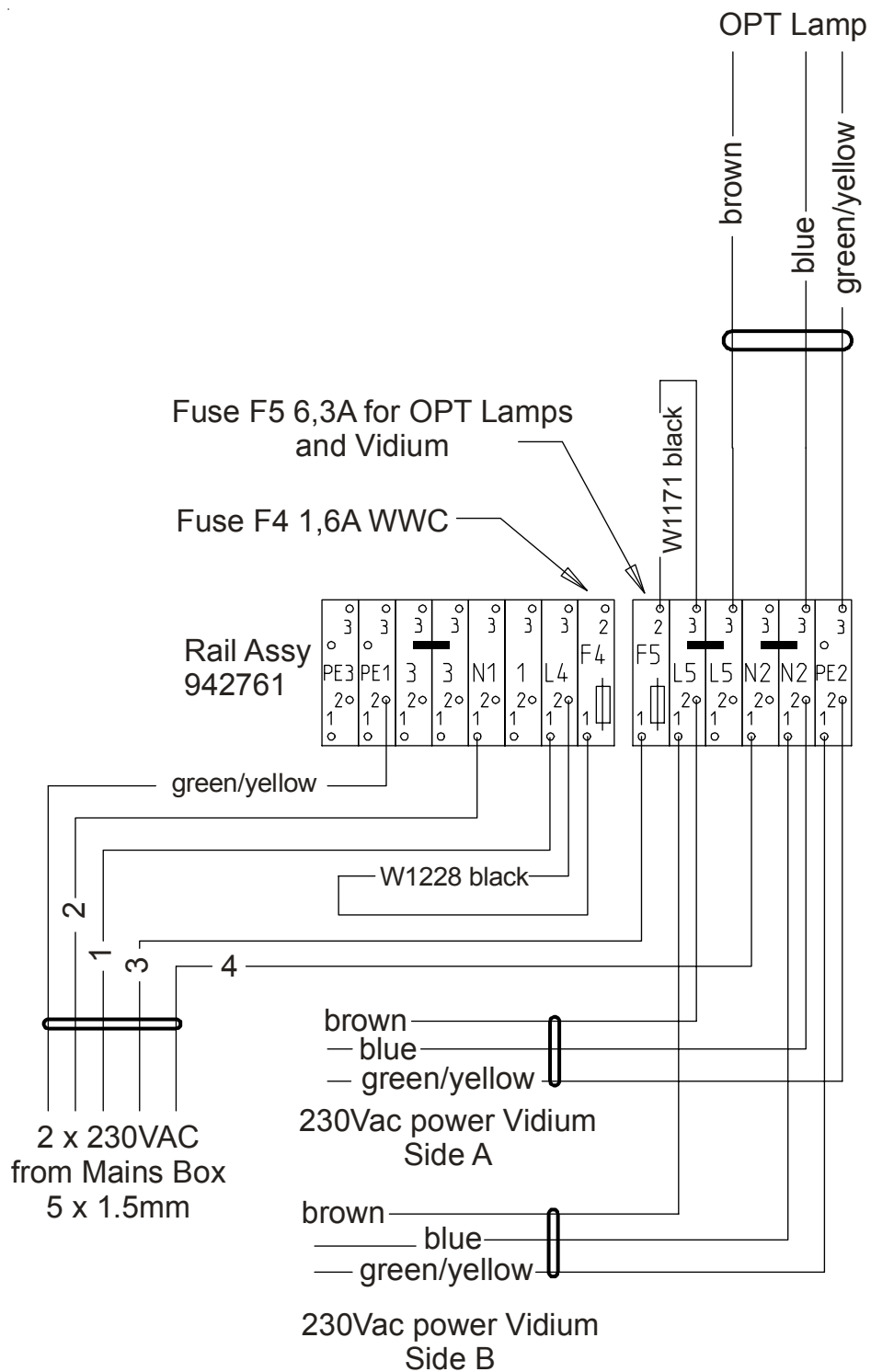


Terminals 2 x 2 way  
on option rail

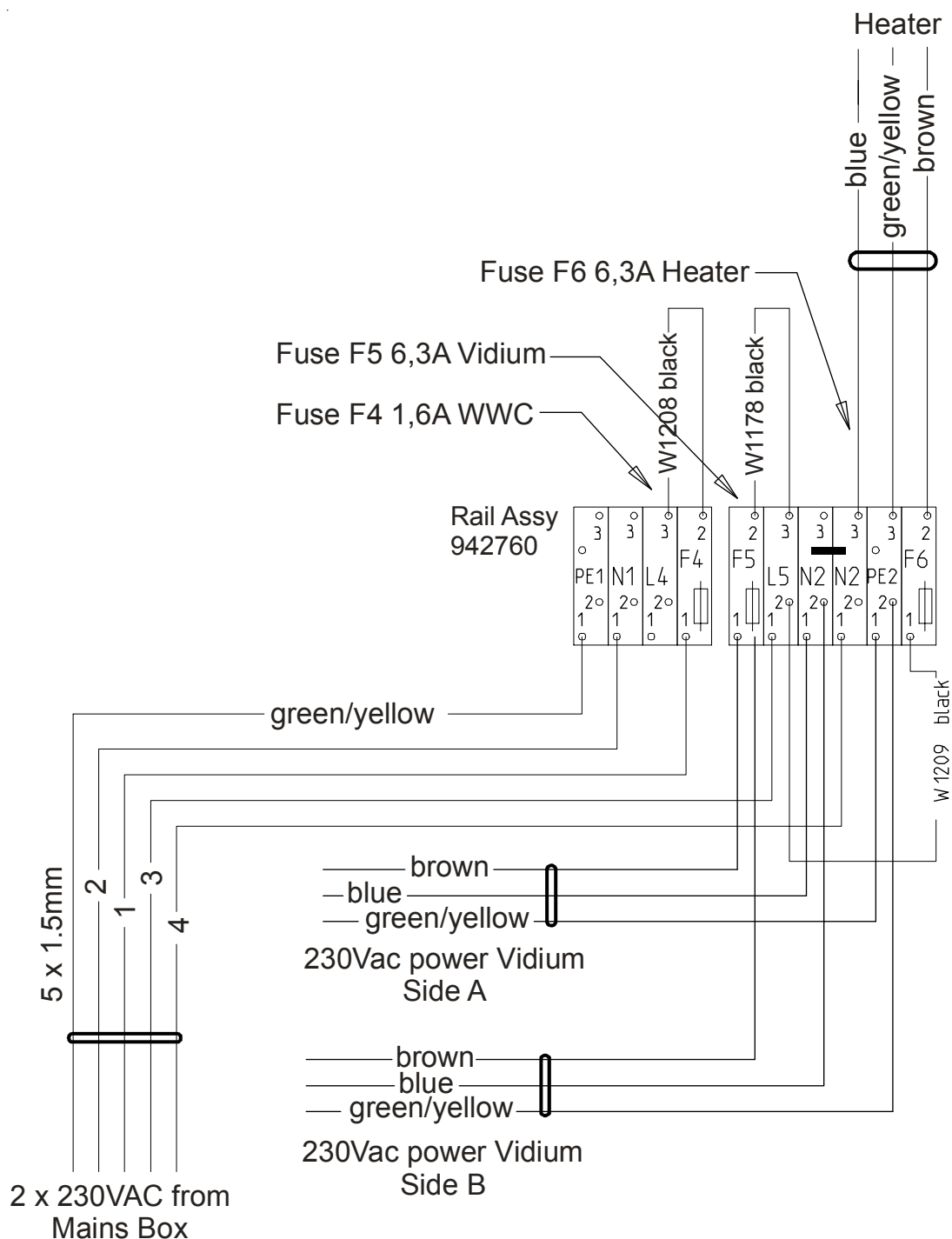
### Vidium and Payment





Vidium, Fire detection, Payment and OPT Lamp

Vidium and Heater



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## CONTENTS

<b>6</b>	<b>COMMISSIONING .....</b>	<b>6-2</b>
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6.2	Calibration of the Dispenser .....	6-3
6.2.1	Mechanical Calibration of the Meter .....	6-4
6.2.2	Electronic Calibration of the MPE Pulser .....	6-5
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6.3	Final Checks .....	6-8
6.4	Handing over to the Station Manager .....	6-8

## 6 COMMISSIONING

The procedures in this section are Tokheim recommended procedures for commissioning the dispenser but differences may exist in the standards relating to commissioning in different countries and local regions, in which case the local and/or national standards must be employed.

Follow the instructions given in section 4.8 to gain access to the calculator head.

### 6.1 Testing and programming the Dispenser

Prior to Commissioning, the following must be checked:-

- Ensure that all the cabling and hydraulic connections have been made correctly.
- Check that power is present.

**Note : Disconnect the Comms before switching on power to the dispenser. This will reduce the possibility of errors.**

- Check that the voltage of power supply is in accordance with the WWC calculator voltage.
- Check that back-up batteries are in correct working order.

#### 6.1.1 PROGRAMMING THE DISPENSER

Refer to separate WWC T1 User Manual for more detailed information.

- If permitted, use the User Access Keypad (UAK) to place the dispenser(s) in Stand-alone Mode and enter the unit prices.
- Alternatively, use the UAK to place the dispenser in Self-Service Mode. Re-program the console for the new dispenser. The unit prices will be communicated automatically to the dispenser.
- Check the unit prices are correct for each new dispenser.
- Where applicable, note the readings on the electronic and mechanical totalisers.

#### 6.1.2 DISPENSER FUNCTIONS

- Where fitted, check that the leakage plates are correctly installed.
- Carry out a test filling using each nozzle and check all supported functions are working correctly (local preset, HS/LS, etc.).
- Check that the nozzles correspond to the correct products and that product names are correct.
- Check the correct operation of all hose retraction systems.
- Check the correct operation of all locks.
- Check the calculator lighting (where applicable).
- Check that all required warning stickers are in the correct positions.

### 6.1.3 TESTING THE DISPENSER

The following procedures must be performed at each nozzle position:-

- Test the flow rates (litres/minute) - refer to the WWC Calculator Manual for more detailed information.

**Note : Flow rates will vary depending on site conditions, and should be adjusted accordingly using the pump bypass.**

**For VR nozzles, set the flow rate between 36 and 40 LPM.**

- Test the meters are within the legal requirements:-
  - Lift each nozzle and deliver approximately 20 litres into a Tokheim approved calibrated container until all air and fuel substitute has been expelled through the nozzle and/or air vent pipes.

**Note : Discard this filling since it will contain fuel substitute from the dispenser pipes and components and air from the supply pipes.**

**IMPORTANT : DISCARD ALL TEST FILLINGS SAFELY.**

- Perform a test filling into the calibrated container until 20 litres have been dispensed according to the calculator display.
- Read the measurement on the calibrated container.

If the fuel dispensed into the container is above or below the calibration line (i.e. greater or less than the 20 litres dispensed) then the meter must be adjusted to ensure Weights & Measures (W&M) compliance.

**Note : W&M regulations vary according to different countries.**

## 6.2 Calibration of the Dispenser

If the meter is fitted with an enhanced pulser for electronic calibration (MPE-EC) or temperature compensation (MPE-TC) then it should not be necessary to perform mechanical calibration. Refer to section 6.2.2 to perform electronic calibration.

### MID CERTIFIED DISPENSERS

MID certified dispensers are calibrated in the factory with the relevant seals stamped so it can be put into operation immediately upon installation without Weights & Measures verification. Refer to section 1.7 for the identification of MID dispensers.

If requested by the site owner, a calibration check could be performed as part of the commissioning procedure.

If the calibration is outwith legal tolerances, the factory MID verification would be invalidated. The meter should be adjusted by the commissioning engineer (under factory approval) before the dispenser becomes operational.

### 6.2.1 MECHANICAL CALIBRATION OF THE METER

- Carefully remove the W&M seal on the meter.
- Use a TX30 bit to remove the hexalobular screw on the plastic protective cover on the meter.
- Use a 10mm spanner to calibrate the piston meter by turning **BOTH** adjustment screws.



**Note : If the error is greater than 0.05% then balance the error by adjusting both screws equally.**

- Adjust in a clockwise direction to reduce the amount of fuel delivered i.e. if the fuel in the container is greater than the reading on the calculator display.
- Adjust in an anti-clockwise direction to increase the amount of fuel delivered i.e. if the fuel in the container is less than the reading on the calculator display.

**Note : each “click” per adjustment screw corresponds to approximately 0.05% or 10ml.**

- Re-test the dispenser until calibration is within acceptable tolerance levels.
- Replace the W&M seals to the adjusted meter.

## 6.2.2 ELECTRONIC CALIBRATION OF THE MPE PULSER

Refer to separate MPE Pulser Manual for more detailed information. Each MPE pulser is required to be set up and configured independently.

**IMPORTANT - To perform EC, the EC function must be turned ON and the TC function must be switched OFF.**

Connect the User Access Keypad (UAK) to the relevant Dipnet connection on the Pulser Sealing Board and power up the UAK.

## INITIAL SET UP

		U	A	M		f	o	r		W	W	C		
		V	e	r	s	i	o	n	:		0	1	0	7

The first screen is displayed for a few seconds. Check the software version is 01.07 or higher.

0	7	5	0	.	0	0				+	2	0	.	3	°	C
0	0									0	0					0

The UAK checks for connected devices then alternately flashes between two delivery messages (displaying raw volume, EC volume, TC volume and density, temperature, hose expansion time, value, suppressed and flow rate).

ON	1	M	P	E		0	1	.	0	7					D	3	3	F
		1	:	M	A		2	:	T	S	T		3	:	S	I	M	

Press ON to start configuration. A choice of menus is displayed. Press 1 to enter MAINTENANCE menu.

=	2	1	:	E	C					2	:	S	E	T				
		3	:	S	E	R	V			4	:	A	D	C				

Press 2 to enter SET menu to allow entry of the EC/TC parameters.

↓	7	P	A	R	A	M	E	T	E	R	S							
		S	e	t		d	i	r	e	c	t	i	o	n				

The first parameter, DIRECTION, will set the direction of the rotation for the meters. This is preset in the factory. Press 7 to skip to next function.

F4	ENTER	P	A	R	A	M	E	T	E	R	S							
		S	e	t		E	C											

The next parameter, EC, will turn the EC function on or off. Press F4 to enter EC sub menu.

↓	7	F4	ENTER	S	e	t		E	C									
				O	F	F												

Default OFF is displayed. Press 7 to change to ON. Press F4 to save and continue.

F4	ENTER	P	A	R	A	M	E	T	E	R	S							
		S	e	t		T	C											

The next parameter, TC, will turn the TC function on or off. Press F4 to enter TC sub menu.

F4	ENTER	S	e	t		T	C										O	F	F

Default OFF is displayed. Press F4 to save and continue. **IMPORTANT : TC must be OFF if EC is to be performed.**

F1	BACK	1	:	E	C					2	:	S	E	T				
		3	:	S	E	R	V			4	:	A	D	C				

Press F1 to return to MAINTENANCE menu.



**TEST FILLING PROCEDURE**

- Do a test filling at maximum flow rate into a W&M calibrated container.
- Stop the delivery manually when the exact nominal volume of the can is displayed on the calculator display.
- Check the volume on the gauge on the calibrated container.
- If the difference between the container volume and the calculator display does not exceed the maximum allowed deviation (check local requirements) then no further action is necessary. If the difference is outwith the maximum allowed deviation then follow the instructions below to perform electronic calibration.

**ELECTRONIC CALIBRATION FUNCTION**

Perform a test filling as described above.



M	P	E	0	1	.	0	7			D	3	3	F	
1	:	M	A		2	:	T	S	T	3	:	S	I	M

Press ON to start configuration. A choice of menus will be displayed. Press 1 to enter MAINTENANCE menu.



1	:	E	C			2	:	S	E	T			
3	:	S	E	R	V	4	:	A	D	C			

Press 1 to enter EC menu.



D	i	s	p	l	a	y	e	d		v	o	l	u	m	e
-	-	-	-	.	-	L									

Read the volume displayed on the calculator and enter into the UAK using the numeric keys. Press F4 to save and continue.



C	a	n		v	o	l	u	m	e						
-	-	-	-	.	-	L									

Read the volume displayed on the calibrated container and enter into the UAK using the numeric keys. Press F4 to save and continue.



C	A	L	I	B	R	A	T	I	O	N		O	K		

If the difference is within acceptable limits i.e. +/- 0.5% then a new calibration factor will be calculated and stored and CALIBRATION OK is displayed.



C	A	L	I	B	R	A	T	I	O	N		E	R	R	
N	O		C	H	A	N	G	E							

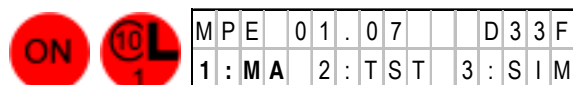
If the difference is outwith the acceptable limit then CALIBRATION ERR is displayed. Manual calibration of the meter should then be performed before attempting electronic calibration again.

1	:	E	C			2	:	S	E	T			
3	:	S	E	R	V	4	:	A	D	C			

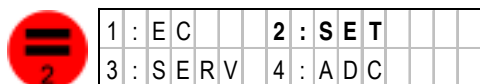
Press F1 to return to MAINTENANCE menu.

## 6.2.3 TEMPERATURE COMPENSATION FUNCTION

Refer to separate MPE Pulser Manual for more detailed information. To set the temperature compensation (TC) function:-



Press ON to start configuration.  
A choice of menus will be displayed.  
Press 1 to enter MAINTENANCE menu.



Press 2 to enter SET UP menu.



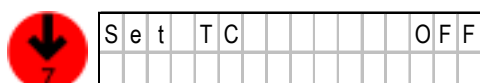
The first parameter, DIRECTION, is displayed.  
Press 7 to skip to next function.



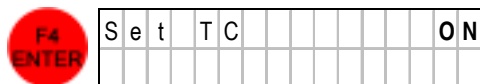
The next parameter, EC, is displayed. Press 7 to skip to next function.



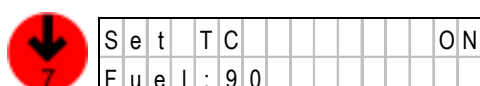
The next parameter, TC, is displayed. Press F4 to enter TC sub menu.



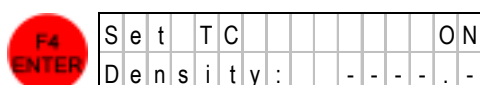
Default OFF is displayed. Press 7 to change to ON.  
**IMPORTANT : TC must be OFF if EC is to be performed.**



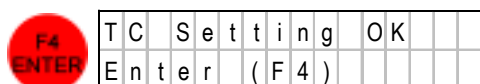
Press F4 to save and continue.



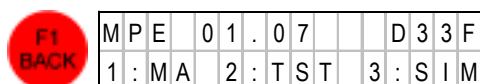
Press 7 to scroll through fuel density options:-  
90 = unleaded 90 (750kg/m<sup>3</sup>)  
95 = unleaded 95 (750kg/m<sup>3</sup>)  
98 = unleaded 98 (755kg/m<sup>3</sup>)  
Diesel = diesel (833kg/m<sup>3</sup>)  
LPG = LPG (537kg/m<sup>3</sup>)



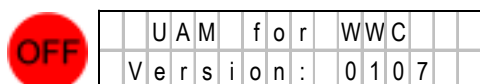
Or enter density value for different fuel type using the numeric keys. Press F4 to save and continue.



Press F4 to continue.



Press F1 several times until the main menu is displayed.



Press OFF to disable the UAK and allow it to be disconnected safely.

**6.3 Final Checks**

- Check that all W&M requirements have been fulfilled.
- Where applicable, use the UAK to check the limit of the High Speed Diesel as per W&M regulations.
- Where applicable, note the readings on the electronic and mechanical totalisers.
- Where applicable, clear the error counters.
- Note the type/serial number(s) of the dispenser(s).
- Complete the Arrival Quality checklists and country specific product identification forms for the dispensers and return them to the local Sales & Service Division.

**6.4 Handing over to the Station Manager**

Explain to the Station Manager the working of the dispenser(s) and train him in their use (according to the User Manual).

Together with the Station Manager, go through the Acceptation checklist to check that everything has been delivered as ordered and is in good condition. Both the Service Engineer/Technician and Station Manager must sign the checklist.

The Station Manager must check the unit prices.

Hand over the following documents to the Station Manager:-

- One copy of the installation report including the totals of all totalisers and the type and serial numbers of dispenser(s).
- User Manual.
- Declaration of Conformity (usually located in the Calculator Head).
- Copy of signed Acceptation checklist (usually located in the Calculator Head).
- All keys.

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## **GLOSSARY OF TERMS USED IN THIS MANUAL**

DIT : DISPENSER INTEGRATED TERMINALS  
HBEF : HIGH BLEND ETHANOL FUELS  
HS / LS : HIGH SPEED / LOW SPEED  
HSM : HIGH SPEED MASTER  
MICC : MINERAL INSULATED COPPER CLAD CABLE  
MPE-EC : ENHANCED PULSER METER, ELECTRONIC CALIBRATION  
MPE-TC : ENHANCED PULSER METER, TEMPERATURE CALIBRATION  
OPT : OUTDOOR PAYMENT TERMINALS  
SAT : SATELLITE  
TQC : TOKHEIM QUALITY CALCULATOR  
TQM : TOKHEIM QUALITY METER  
TQP-HS : TOKHEIM QUALITY PUMP - HIGH SPEED  
TQP-RS : TOKHEIM QUALITY PUMP - REGULAR SPEED  
UAK : USER ACCESS KEYPAD  
VHS : VERY HIGH SPEED  
VHSM : VERY HIGH SPEED MASTER  
VR : VAPOUR RECOVERY  
W&M : WEIGHTS AND MEASURES  
WWC : WORLD WIDE CALCULATOR



For any further information and detailed contacts for each country,  
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