

2

General Safety

Pressure Jets

Gas Hazards

Contact with Sewage

3

Description

Installation

Earthing

4

Operation

Jetting Truck Supply

Booster Pump Set

Training

Maintenance

5

Trouble Shooting

6

Technical Data

Construction

Performance

7

Typical general Arrangement Drawing

8

Commissioning Sheet

10

Frequently Asked Questions

12

General Terms & Conditions

### GENERAL SAFETY

BWI products are always designed to our highest standards. Our staff can advise you at any time during installation and operation if any questions arise regarding how to safely use our products.

What the law says:-

You must carry out a suitable and sufficient assessment of the risks for all work activities for the purpose of deciding what measures are necessary for safety (The Management of Health and Safety at Work Regulations 1999).

### PRESSURE JETS

The Tankmaster is designed to be used as a washing device that sprays four jets of potable water or final effluent at a pressure of 6 to 10 Bar. Therefore operator training is required to appreciate the function of the equipment. The Tankmaster should not be used when an operator is within the wash radius of the jets (see performance table below). The Tankmaster will not spray jets above the horizontal line of the nozzles if installed correctly.

### GAS HAZARDS

Where a Tankmaster is to be installed in a confined space, there may be hazardous gases. Please contact your Health and Safety department for guidance and <http://www.hse.gov.uk> . We will not be liable for any damage caused if the Tankmaster is used in a dangerous or explosive environment. Our washheads are ATEX compliant.

### CONTACT WITH SEWAGE

Should a Tankmaster need to be removed from its installation then it is highly likely to be contaminated with sewerage. Make sure you understand the risks to health and the ways you can pick up infections. Please contact your Health and Safety department for guidance and <http://www.hse.gov.uk> .

### DESCRIPTION

The Tankmaster is a hydraulically operated device used to direct pressurised jets of potable water or final effluent onto Storm tank and retention sewer floors and walls in order to remove odourous and foul material following a storm event. It can be mounted on a support frame or to the soffit with a roof mounting bracket. Water is pumped to the Tankmaster by a jetting tanker or booster pump set at pressures up to 10 Bar. During operation the jets will sweep in an arc from the horizontal downwards and index around at stepped intervals to give a 360 degree coverage. The Tankmaster will not spray above the horizontal plane unless installed incorrectly.

### INSTALLATION

NOTE: Never install the Tankmaster without first thoroughly flushing all connecting pipework of swarf and debris.

If the site is a retrofit installation then the tank surfaces should be cleaned thoroughly by a high pressure hose before installation.

All Tankmaster wash heads are provided with a quick release coupling and should be used as an interface between the fixed positioning and the Tankmaster.

1. Secure the mounting bracket or davit to concrete.
2. Connect one half of the quick release coupling to the roof mounting bracket.
3. Connect the other half of the quick release coupling to the Tankmaster. NEVER turn the body of the Tankmaster to tighten the coupling. Hold the Tankmaster by the flats provided on the neck.
4. Couple the two halves of the quick release coupling together.

### EARTHING.

Always ensure that the Tankmaster and pipework are earthed. Some sealing compounds and tapes can isolate the passage of static electricity. If in doubt consult your qualified electrician.

### OPERATION – jetter truck supply.

The Tankmaster should be run at 6Bar or more. This is the pressure at the Tankmaster and NOT at the jetting truck supply. Always remember to take into account losses through pipework when operating a Tankmaster. Example – 25mm ID pipe of 100m length will have losses of 7 Bar at 100lpm. Therefore we would need the jetting truck to operate at a minimum of 13 Bar.

Experience in cleaning tanks with our Tankmaster wash head will allow the operator to determine how long a screen should be cleaned for should it be done by jetter truck. Tanks with a pumped system will have a pre-set cleaning time.

The length of clean time depends on the following:

Flow rate and pressure of water to the wash head.

Type of screen being cleaned.

Size of screen.

Number of wash heads employed.

Type of screenings on the screen.

The interval between cleans.

The length of time that the screen is being cleaned after a storm event.

Whether it is just the floor or the whole tank being cleaned.

### OPERATION – booster pump set

The booster pump will have been selected to provide the correct pressure and flow at the Tankmaster. Depending on the system the pump will be engaged automatically or by hand. See the relevant O & M manual if this system is being used.

### TRAINING

Operators should have access to this manual and be trained in the operation of the Tankmaster. Each application is different and so an appreciation of how our Tankmaster operates in the field is important. BWI staff can be commissioned to carry out training.

### MAINTENANCE

Should the Tankmaster require maintenance it should be removed, cleaned thoroughly and returned to BWI Ltd, Lower Road Trading Estate, Ledbury, HR8 2DH. There are no operator serviceable parts.



### TROUBLE SHOOTING

Check inlet pressure. The Tankmaster should operate mechanically i.e. jet water and index around, at 6 Bar minimum.

Tap out the inlet of the Tankmaster to see if debris has entered the inlet.

Unscrew the nozzles and check for blockage.

Hold the unit body and rotate the nozzles fully back and forth. The neck should index around after each return stroke. Do not force the nozzles they should move freely.

Alternatively, contact BWI for advice on 01531 632476.

### TECHNICAL DATA

#### CONSTRUCTION:

Materials of construction	316 Stainless steel, Nitrile O' rings
Weight	2.3 kg (Type 400) and 9.5kg (Type 600)
Inlet thread	1" BSPP (Type 400) 1 1/2" BSPP (Type 600)
Max operating pressure	10 Bar

#### PERFORMANCE:

Below are tables indicating the flow requirement PER HEAD at typical operating pressures.

TANKMASTER 400 – Wash radius of 7 metres

Nozzle Diameter	Pressure BAR	Flow m <sup>3</sup> /Hr
4 x 8mm	6	9
	8	10

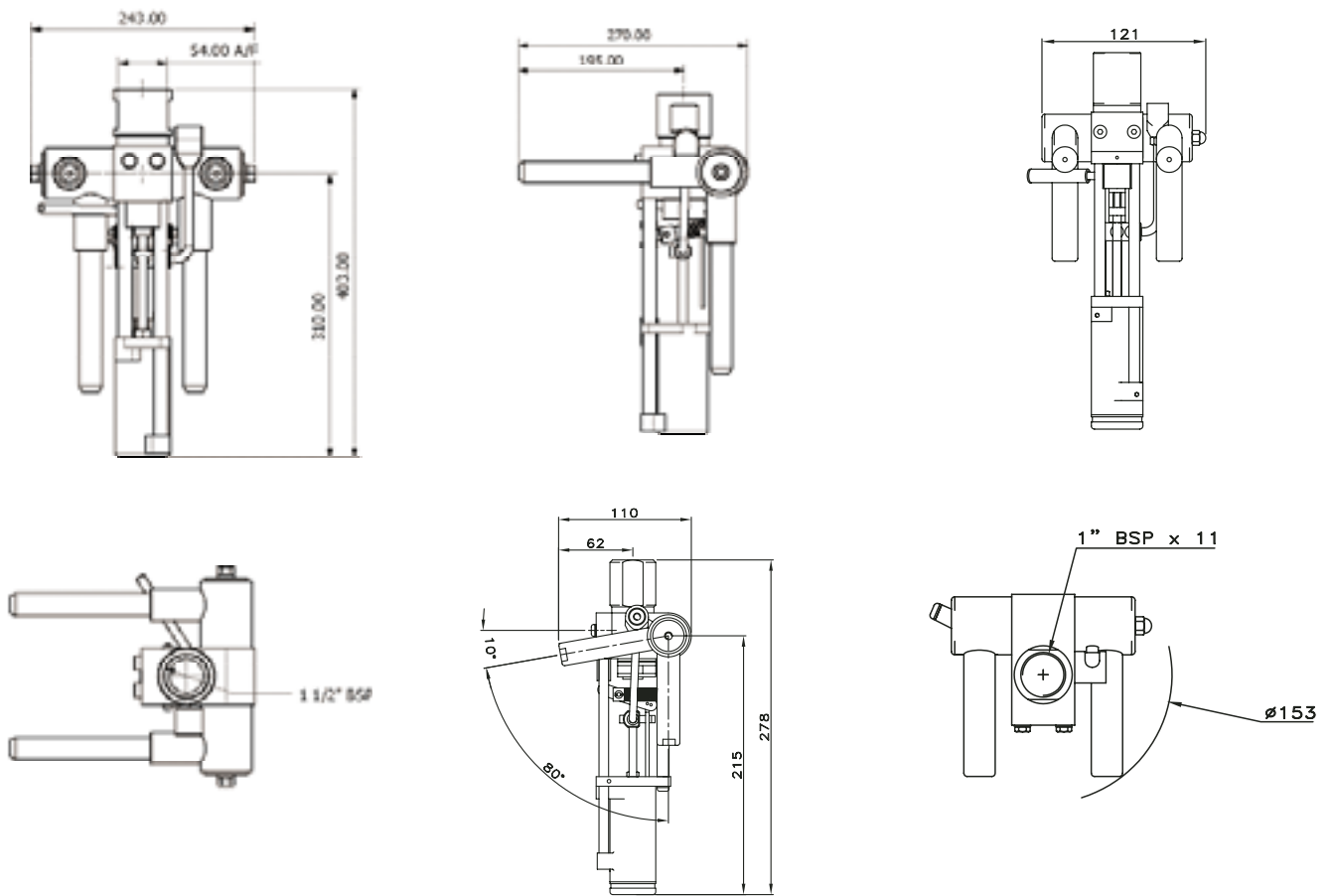
TANKMASTER 600 – Wash radius of 10 metres

Nozzle Diameter	Pressure BAR	Flow m <sup>3</sup> /Hr
4 x 8mm	6	28
	8	35.5

# O&M Manual

TANKMASTER 400 & 600

## TYPICAL GENERAL ARRANGEMENT





### TANKMASTER COMMISSIONING SHEET

Date	Customer	Contact	
Telephone	Order Number	Product	S/No

(Input data as required or circle answer(s).)

### BEFORE INSTALLING THE WASH HEAD - PURGE THE LINE.

Has the line been purged before installing the Tankmaster?	YES / NO
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### INSTALLATION

Check Tankmaster is free from debris (invert head and tap gently)	Done
Install Tankmaster to mounting bracket	Done

### WATER

IMPORTANT : The Tankmaster requires 6 Bar pressure to operate AT THE HEAD i.e. the jetter or pump will need to run at higher values to take into account losses in the pipe. We can calculate this for you.

Water type to be used to operate wash head	Potable / Final Effluent
Discharge pressure of jetter/pump	Bar / PSI
Flow rate of jetter/pump	lps / lpm / m <sup>2</sup> /Hr
Pipe size to wash head (outside diameter)	mm
Pipe length from jetter/pump to Tankmaster	m
Pipe type used	MDPE / Stainless Steel / other

### ELECTRICAL PANEL (if supplied).

Supply voltage	v / ph / Hz
Is the P&ID as desired (see copy in the O&M Manual)	YES / NO

### PUMP DATA (if supplied).

Supply voltage	v/ ph/ HZ
Motor drawn amps (see panel dial when running)	Amps
Overload setting (see P&ID in O&M Manual)	Amps
Max Flow Rate of pump (see pump label)	lps / lpm / m <sup>2</sup> /Hr
Max. Discharge pressure of pump	Bar / PSI



### TANKMASTER COMMISSIONING SHEET (CONT)

#### BREAK TANK (if supplied).

Do the tank dimensions match those on the drawing?	YES / NO
Is the tank sited as requested?	YES / NO
Is there a hard standing for the tank?	YES / NO
Is there a drain cock on the tank?	YES / NO
Does the tank conform to the required water standard (if so which)?	YES / NO
Is the water inlet fitting the correct size?	YES / NO

#### GENERAL

Is water exiting the wash head correctly?	YES / NO
Does the wash head rotate after every two sweeps of the nozzle?	YES / NO
Do the nozzles focus onto the area that needs cleaning?	YES / NO
Is the tank cleaned to the agreed standard (attach copy to this sheet)?	YES / NO
Do you have a copy of the Operation and Maintenance manual?	YES / NO

#### COMMENTS

### FREQUENTLY ASKED QUESTIONS

What is the required flow rate to operate the head?

TANKMASTER 400

Nozzle Diameter	Pressure BAR	Flow m <sup>2</sup> /Hr
4 x 6.5mm	6	9
	8	10

TANKMASTER 600

Nozzle Diameter	Pressure BAR	Flow m <sup>2</sup> /Hr
4 x 8mm	6	28
	8	35.5

What is the required pressure to operate the head?

Please refer to the above table.

How much water is needed to clean a tank?

Please refer the above table.

Why is there a quick release coupling on the wash head?

The quick release coupling has two functions. Firstly, if the wash head is connected directly to the mounting bracket there is a risk of turning the unit by the body rather than the flats on the collar. This can result in the index mechanism being broken. Secondly, the QRC allows very quick installation of the wash head after the line has been purged during commissioning.

Can the wash head be flooded?

No.

Does the wash head need frost protection?

No. It is self draining and so unlikely to freeze. All pipework should be correctly insulated.

### FREQUENTLY ASKED QUESTIONS (CONT)

#### When will the wash head need maintenance?

The typical service life is 250 running hours. A typical wash should take no more than 20 minutes so this is an extremely long interval. Annual inspection will indicate any problems.

#### What size pipe do I need from the water source (e.g. jetter) to the wash head?

Please forward a copy of your design and we will very quickly calculate this for you.

#### What happens if I over pressurise the Tankmaster?

There is a risk that the pipeline to the Tankmaster will split. It is unlikely that the Tankmaster will be damaged as it has been tested at 25 Bar.

#### Why aren't the water jets reaching all parts of the tank?

Refer to the above table. The cleaning radius is the amount of tank floor that will be cleaned. The wetting radius is the total area within the tank that will be wetted per wash head.

### TERMS & CONDITIONS OF SALE

1. General: These Conditions of Sale effective January 1 2004 ("the Conditions") supplied by Breconcherry Ltd marketing as BWI ("the Company") to a purchaser ("the Buyer") shall be incorporated into each contract ("the Contract") made by the Company for the sale of the Company's goods ("the Goods"). The Company contracts upon such terms as are agreed between the Company and the Buyer and upon the terms of the Conditions alone. No conditions or terms of the Buyer shall apply to this contract. No variation of any of the Conditions shall be effective unless in writing and signed by a duly authorized representative of the Company.

2. Quotations & Acceptance of Orders: The Contract shall become binding only upon the confirmation of acceptance of an order by the Company in writing and accordingly all quotations made and price or product lists supplied by the Company shall not be treated as an offer to supply Goods in accordance with such quotations or lists.

3. Packaging: Packaging for the Goods shall be at the discretion of the Company which shall have the right to pack the Goods in such manner and with such materials and in such quantities as it in its absolute discretion thinks fit unless detailed packaging instructions are received from the Buyer prior to agreeing a price for the Goods.

4. Price: (a) All prices are net of VAT (b) All prices shall be subject to change at the discretion of the Company at any time prior to delivery, the Company shall notify the Buyer of any such variation before delivery of the Goods.

5. Payment: (a) Liability for payment for Goods supplied shall arise on delivery and payment is due thirty days from the end of the month in which the invoice is rendered or unless otherwise agreed in writing by the Company. (a) Payment is due and the Company will sue for the price whether or not property in the Goods has passed (Clause 9). (b) Sums unpaid after the due date shall bear interest until the day payment is received at the rate of 5% pa over the base rate Barclays Bank plc accruing from day to day from the date of delivery until payment in full. (c) If the recovery of sums outstanding is passed to a Debt Collection Agency the Buyer shall pay the Company's costs in instructing the Debt Collection Agency and all legal costs. (d) Without prejudice to any other rights or remedies of the Company any default by the Buyer in making payment on the due date shall entitle the Company to suspend deliveries under the Contract or any other contract and to treat the Contract as repudiated by the Buyer and determined if the Buyer has not within 14 days of receiving written notice from the Company paid all sums due to the Company.

6. Delivery: (a) The goods are delivered as soon as contact is broken between the consignment and the delivery vehicle during off loading at the Buyer's premises or other delivery location agreed between the Company and the Buyer, except if the Buyer collects or arranges collection of the Goods or nominates a carrier for the Goods, delivery will be when the Goods are loaded on the collection or carrier's vehicle. (b) The Company will endeavour to complete delivery on or before any dates requested by the buyer but will not be liable for any delay in delivery. (c) The Buyer shall accept immediate delivery or arrange to collect the Goods or arrange suitable storage, failing which the Company may either (i) effect delivery by whatever means it thinks most appropriate; or (ii) arrange storage at the Buyer's risk and expense pending delivery; or (iii) re-sell or otherwise dispose of the Goods without prejudice to any other rights the Company may have against the Buyer for breach of contract. (d) Where the agreement provides for delivery by installments each installment shall constitute a separate contract and any failure or defect in any one or more installments shall not entitle the Buyer to repudiate the agreement or to cancel any subsequent installments. (e) It is the Buyer's responsibility to notify the Company if the Goods have not been received by the Buyer within seven days of the date of receipt of the Company's invoice. If no notification is made the Buyer shall be deemed to have received the Goods.

7. Examination and Claims: (a) The Buyer shall upon delivery examine the Goods and shall promptly (and within seven working days of delivery) notify in writing the Company and the carrier, of any apparent damage defect or shortage. (b) The Buyer shall comply with the carriers rules regulations and requirements, to enable the Company to make a claim against the carrier in respect of any damage in transit. (c) Claims in respect of damage defects or shortage not apparent on examination (a) must be notified in writing to the Company within twenty-one days of the date of delivery. In the absence of notification the Company shall, subject to any claim which the Buyer may have under the Guarantee and Warranty (clause 8), be deemed conclusively to have properly performed its obligations under the Contract.

8. Guarantee and Warranty: (a) The Goods are subject to the guarantee ("the Guarantee"), if any, submitted by the Company, (b) Save as referred to in (a) above the Company warrants only ("the Warranty") that the Goods are reasonably free from defects in design (other than a design submitted or specified by the Buyer) in material or workmanship for twelve months from the date of delivery ("the Warranty Period") provided the Buyer has given the Company written notice and satisfactory proof of any defect promptly upon discovery of such defect but in no case later than seven days after expiry of the Warranty Period. (c) The Company's obligations to the Buyer under the Warranty shall not apply:- (i) to damage caused by the Buyer's or any third party's act, default or misuse of the Goods or by failure to follow any instructions supplied with the Goods. (ii) If the Goods have been stored, handled, installed or applied in such a way that damage is likely to occur; (iii) If the Goods are altered, modified or repaired in any place other than the Company's factory or by persons not expressly nominated; (iv) If non approved, improper or ineffective chemicals, detergents or insufficient management procedures are used in relation to the Goods, or the use conditions are varied from the test samples conducted prior to the Company making the offer to supply. (d) Subject to C above the Company shall at its sole option replace or refund the purchase price for the Goods found to be defective in design materials or workmanship. (e) The Company's obligation to refund or replace shall constitute the full extent of the Company's liability in respect of any loss or damage sustained by the Buyer whether caused by any breach of the Contract or by misrepresentation or by the negligence of the Company its employees or agents or arising from any other cause whatsoever and the Company shall not be liable for any consequential economic, direct or indirect loss suffered by the Buyer arising therefrom. (f) The cost to the Company of and incidental to the return by the Buyer to the Company of any of the Goods delivered hereunder shall, unless the Company has accepted responsibility, shall be the responsibility of the Buyer who shall indemnify the Company against all costs including without limitation to the foregoing, costs of transport, testing or other cost or loss to the Company.

9. Property and Risk: (a) Risk shall pass to the Buyer on delivery (as defined in 6. Delivery above) and the Goods must be insured accordingly. (b) (i) Property (legal and beneficial) in the Goods shall remain in the Company until all sums owing to the Company whether under the Contract or any other contract made at any time between the Company and the Buyer ("the Indebtedness") shall have been paid in full. Until such time, the Buyer shall hold the goods as bailee for the Company. (ii) The Buyer until otherwise notified by the Company or on the happening of the events specified in (ix) ("the Events") may in the ordinary course of its business offer for sale and sell the Goods, or any new product created by the Goods being admitted or converted into new goods ("the

New Products") at the best obtainable price as a principal vis a vis sub-buyers and not as the agent of the Company. Prior to any such sub-sale of the Goods or the New Products the Buyer shall first notify the Company of its intention to sell the Goods or the New Products. (iii) The entire proceeds of such sub-sale of the Goods or New Products shall belong legally and beneficially to the Company subject to the provisions set out and unless the Company demands payment of such proceeds of sale to be made directly to it, the Buyer shall pay the entire proceeds of sale into a separate interest bearing bank account in the name of the Company or if the Company gives its prior written consent the Buyer shall be entitled to pierce and maintain the proceeds of sale otherwise than by depositing the same in a designated bank account and shall ensure that all such proceeds are kept by or on behalf of the Company in a separate identifiable form. (iv) In particular, but without prejudice to the generality of the foregoing the Buyer shall not pay the proceeds of sale into any bank account which is overdrawn. (v) Forthwith upon receipt of the proceeds of sale the Buyer shall be liable to pay on demand to the Company the whole of the proceeds of sale subject to the Company undertaking to repay or set-off any balance remaining after payment in full of the Indebtedness and shall not use or deal with the proceeds of sale in anyway whatsoever until the Indebtedness has been paid in full. (vi) If required the Buyer shall upon receipt of written notice from the Company, assign to the Company the benefit of all contracts made with third parties in respect of sub-sales of the Goods or New Products. (vii) If the Goods are not readily identifiable and removable from the products and materials of the Buyer forming the New Products, the legal and beneficial ownership of the New Products and the property therein shall vest in the Company subject to (viii) Upon any sale of the New Products by the Company, if the proceeds of sale exceed the price or the balance of the price or the value of the Goods owing to the Company by the Buyer, the Company shall apply the balance of the proceeds of sale as follows: (a) First in re-imbursing the Company all costs and expenses incurred in taking possession and sale of the New Products; (b) Secondly, in paying any amount due and owing to other creditors of the Buyer in respect of other products or materials incorporated in the manufacture of the New Products but only where the ownership of such products or materials has been successfully reserved by such creditors and the claims of such creditors have been notified to the Buyer or the Liquidator, administrator or administrative receiver of the Buyer; (c) Thirdly, in paying any balancing amount in respect of products or materials provided by the Buyer which were incorporated into the New Products. (ix) The Events are: (a) the giving of any notice to the Buyer that a receiver, manager, administrative receiver, supervisor, nominee or administrator is to be or has been appointed over any of the property or assets of the Buyer or that a petition to wind up the Buyer is to be or has been presented or that an application for an administration order is to be or has been made or of any notice of a resolution to wind up the Buyer (save for the purposes of a bona fide reconstruction or amalgamation). (b) a decision by the Buyer that the Buyer intends to make any arrangement or composition with its creditors generally; (c) where the Buyer pursuant to section 123 or 268 of the Insolvency Act 1986 appears to be unable to pay a debt; (d) any distress or execution levied or threatened to be levied on any property or assets of the Buyer; (e) the inability of the Buyer to pay its debts as they fall due. (f) On receipt of notification from the Company under (ii) or on the happening of any of the Events, the power of sale of the Buyer in respect of the Goods or the New Products shall cease and the Buyer shall immediately deliver the Goods and/or the New Products to such address as the Company shall specify, or the Company shall have the right to enter on any premises in the ownership control or possession of the Buyer who shall indemnify the Company on a full indemnity basis against all loss, damage, costs or expenses in respect of third party claims. For the avoidance of doubt the Buyer hereby unconditionally and irrevocably authorises the Company or its nominated agents or representatives to enter into or upon premises or land in the ownership possession or control of the Buyer for the purpose of the re-possession of the Goods or the New Products.

10. Breach by or Insolvency by the Buyer: If the Buyer shall not comply with any of its obligations to the Company or upon the occurrence of any of the Events referred to in Clause 9(b), the Company shall have the right forthwith to terminate the Contract but without affecting any other claim, right or remedy of the Company against the Buyer.

11. Cancellation, Suspension and Termination: (a) If the Buyer cancels the whole or any part of the Contract the Company may by notice in writing to the Buyer elect to treat the Contract as repudiated and the Buyer shall thereupon be liable to pay to the Company by way of liquidated damages a sum equal to all the expenses incurred by the Company in connection with the Contract including an appropriate amount in respect of administrative overheads, costs and losses of profit. The Company's reasonable estimate of the expenses incurred shall be final and binding on the parties. (b) If for any cause whatsoever beyond its control the Company is unable to make any delivery on the applicable delivery date or perform any of its other obligations under the Contract the Company may by notice in writing to the Buyer terminate the Contract or suspend the Contract without liability for any loss or damage thereby incurred by the Buyer.

12. Export Sales: (a) In respect of the goods outside the United Kingdom ("Export Sales") the provisions of these Conditions shall apply unless inconsistent with the terms of this clause. (b) Unless otherwise specifically agreed between the Company and the Buyer all Export Sales shall be made CIF to the Buyer's premises and the Company's prices as set out in its Price List shall be increased to cover the Company's costs in making such deliveries. (c) Unless otherwise agreed in writing payment shall be made by confirmed irrevocable letter of credit. (d) The Buyer warrants that if an import License or permit is required for the importation of the Goods into the country of destination such Import License or permit has been obtained or will be obtained prior to shipment by the Buyer.

13. Patents, Registered Designs, Trade marks, Trade Names and Copyright: The Buyer shall inform the Company in writing of any infringement or potential infringement of the Company's patents, registered designs, trade marks, trade names or copyright.

14. Force Majeure: (a) In so far as the performance of the Contract by the Company may be affected by any strike, lack of shipping or transport or materials, any restriction regulation decree by any local or municipal authority or government department or by any cause beyond the Company's reasonable control (which shall be construed without reference to the preceding causes) the Company may elect at its absolute discretion either:- (i) to terminate the Contract, or (ii) to proceed to perform or continue performance under the Contract within a reasonable time after the termination of such events or circumstances. (b) In the event that the Company makes an election under Clause 14 (a) the Buyer shall accept the Goods or such part of them as are delivered to it notwithstanding any delay.

15. Proper Law: (a) The Contract is and shall be deemed to have been made in England and shall in all respects be governed by English Law and shall be subject to the jurisdiction of the English Courts. (b) The Company may, should its reasonable opinion any dispute concern matters of a technical nature relating to the Goods, refer the dispute to an independent arbitrator, whose decision shall be binding on the Buyer.