











































## Free-wheel Function & Towing



**ALWAYS ENSURE THAT THE MACHINE IS ON LEVEL GROUND BEFORE DISENGAGING BRAKE ARM. NEVER DISENGAGE THE BRAKE WHEN THE MACHINE IS ON A SLOPE / GRADIENT. NEVER TOW THE MACHINE WITH THE BRAKE ENGAGED AND POWER PLUG CONNECTED! REMOVE BATTERY FUSES**



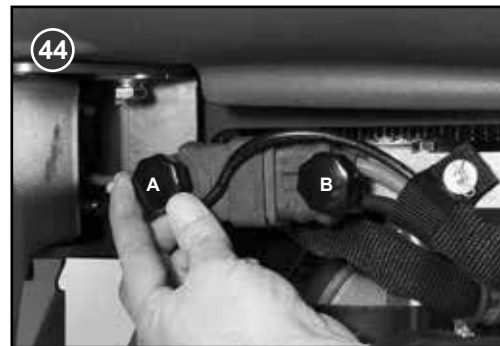
The TTV 678 is equipped with a free-wheel function that will enable the operator to move / tow the machine. The motor brake is disengaged by opening the brake arm on the side of the drive wheel (see Fig.41).



Your start-up kit includes a brake drive disengage key (329945, see Fig.42) which can be inserted between the brake arm and drive housing (see Fig.43).



Once the key has been inserted (see Fig.43) the motor brake will be fully disengaged.  
**The machine will now be in full free-wheel mode.**



Undo and remove the two retaining knobs (fig.A&B).



Pull the power connector block apart and refit the two retaining knobs.  
When destination place reached, remove brake disengage key, connect power plug, fit fuses



When towing the machine ensure that a suitable tow bar is used.  
Care must be taken when towing; **WHEN TOWING DO NOT EXCEED AVERAGE SPEED OF 3 KPH.**  
The machine can be towed from the front bar as indicated (see Fig.46).



**WARNING!**  
**WHEN THE BRAKE IS DISENGAGED AND POWER PLUG IS DISCONNECTED THE MACHINE IS IN FREE-WHEEL MODE AND HAS NO BRAKE FACILITY, WHEN TOWING THE MACHINE ENSURE THAT A SUITABLE TOW BAR IS USED.**

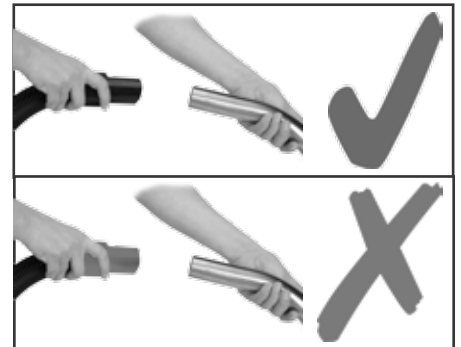
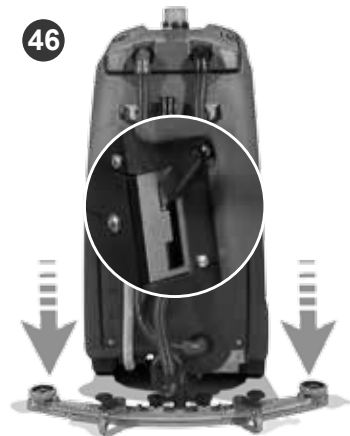
Remember to remove the brake disengage key when you reach your final destination / before using the machine.  
**NOT FOLLOWING DESCRIBED METHOD COULD DAMAGE MAIN CONTROL UNIT AND VOID THE WARRANTY**



## Off-Aisle Cleaning Kit (Optional Extra Accessory)



The optional off-aisle cleaning kit gives added flexibility to the operator. The kit can be used to clean hard to reach / inaccessible areas. Press the blue auxiliary switch on the dashboard (see Fig.45); ensure the floor-tool is in the **lowered position** (see Fig.46) so only the vacuum will operate and all other functions on the machine will become disabled. If floor-tool is in the **raised position** the vacuum will not operate and the control panel lights will flash. The machine will need to be reset by simply turning the ignition key off and on again.



*In the event of a breakdown contact your Numatic dealer or the  
Numatic Technical helpline +44 (0)1460 269268  
(See back page for company addresses or dealers stamp)*


# Trouble Shooting

**Sleeping / rest mode: Battery indicator flashes every 5 seconds indicates machine has been idle for more than 20 minutes. Vario functions disabled cycle key switch!**

Number of bars flashing on display	Fault	Possible Cause	Effect on Product	Investigate the Following	Action Required	If Fault Persists.
	<ul style="list-style-type: none"> <li>* Batteries voltage low.</li> </ul>	<ul style="list-style-type: none"> <li>* Batteries not been charged.</li> <li>* Possible bad connection between batteries, controller, charger or fuses caused by loose connections , damaged wiring , water ingress.</li> <li>* Not accepting charge due to faulty battery/cell.</li> <li>* Charger not functioning.</li> </ul>	<ul style="list-style-type: none"> <li>* Operating time severely reduced or machine will not operate.</li> </ul>	<ul style="list-style-type: none"> <li>* Check when machine last charged.</li> <li>* Switch OFF the machine.</li> <li>* Remove Fuses.</li> <li>* Check connections to batteries, charger and fuses for loose wires or screws.</li> <li>* Check each battery Voltage individually to detect defect unit 10.5V min.</li> <li>* Check battery voltage and charge current.</li> <li>* ensuring charger red fault light is extinguished.</li> </ul>	<ul style="list-style-type: none"> <li>* Charge batteries immediately.</li> <li>* Tighten loose connections and replace damaged components.</li> <li>* Replace batteries as required.</li> <li>* Replace charger.</li> </ul>	
	<ul style="list-style-type: none"> <li>* Traction drive overload.</li> </ul>	<ul style="list-style-type: none"> <li>* Traction drive over current trip due to too high a load.</li> <li>* Traction drive is disconnected or has bad connection due to wiring or connectors becoming damaged, loose or corroded due to water ingress.</li> </ul>	<ul style="list-style-type: none"> <li>* Brake engaged no movement.</li> </ul>	<ul style="list-style-type: none"> <li>* Did machine fall on incline. Check traction wheel free from debris.</li> <li>* Cycle Key switch to resume normal operation.</li> <li>If the above fails then: Switch machine off. Check connections and harness between drive motor and controller.</li> </ul>	<ul style="list-style-type: none"> <li>* Cycle key switch to resume normal operation.</li> <li>* Tighten loose connections and replace damaged components.</li> </ul>	
	<ul style="list-style-type: none"> <li>Brush motor over current trip has occurred.</li> </ul>	<ul style="list-style-type: none"> <li>Rough floor surface.</li> <li>Brush motor has failed or is damaged..</li> <li>Brush motor bad connection.</li> </ul>	<ul style="list-style-type: none"> <li>* Intermittent brush trip.</li> <li>* Brush Motor doesn't run or runs intermittently.</li> </ul>	<ul style="list-style-type: none"> <li>* Brush type suitable for floor surface.</li> <li>* Cycle Key switch to resume normal operation.</li> <li>* If the above fails then: Switch off machine.</li> <li>* Check brush motor for damage.</li> <li>* Check brush motors turn freely.</li> <li>* Cycle key switch to resume normal operation.</li> <li>* If the above fails then:</li> <li>* Switch machine off.</li> <li>* Check connections and harness between Brush Motor and controller.</li> <li>* Check BRUSH Motor connections block underneath chassis , behind mud guard for loose wires and loose screws.</li> <li>* Cycle key switch to resume normal operation.</li> </ul>	<ul style="list-style-type: none"> <li>* Change brush , adjust brush speed and reduce pressure by turning adjustment knob anticlockwise.</li> <li>* Replace effected motor or wiring.</li> </ul>	
	<ul style="list-style-type: none"> <li>* System trip.</li> <li>* Spare Solenoid connection trip.</li> </ul>	<ul style="list-style-type: none"> <li>* System failure.</li> <li>* System has been incorrectly rewired.</li> </ul>	<ul style="list-style-type: none"> <li>* Machine will not operate.</li> <li>* Machine will not operate.</li> </ul>	<ul style="list-style-type: none"> <li>* Replace controller.</li> <li>* Refer to wiring diagram and check the solenoid/water/detergent pump wiring configuration.</li> </ul>	<ul style="list-style-type: none"> <li>* Rectify wiring fault found.</li> </ul>	
	<ul style="list-style-type: none"> <li>* Vac Motor is disconnected, has failed open circuit, has a bad connection or water ingress - temperature trip activated.</li> </ul>	<ul style="list-style-type: none"> <li>* Wiring between Vac motor and Controller is damaged, wiring is loose or wiring connections are loose, possibly wire has come out of a connection block - blocked exhaust</li> </ul>	<ul style="list-style-type: none"> <li>* Vac motor will not operate.</li> </ul>	<ul style="list-style-type: none"> <li>* Cycle Key switch to resume normal operation.</li> <li>* If the above fails then:</li> <li>* Switch off machine.</li> <li>* Check for loose or damaged wiring and connections between Vac motor and controller.</li> <li>* Cycle key switch to resume normal operation.</li> </ul>	<ul style="list-style-type: none"> <li>* Tighten loose connections and replace damaged components - check exhaust clean if necessary.</li> </ul>	

Contact Service Agent.

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Number of bars flashing on display	Fault	Possible Cause	Effect on Product	Investigate the Following	Action Required	If Fault Persists.
* 6 Bars flash continuously. 	* Control system is inhibiting drive.	* Faulty controller.	* Machine will not operate.	* Check controller for water damage.	* Replace controller.	
* 7 Bars flash once with pause 	* Accelerator pedal trip.	* Accelerator pedal being activated without seat switch being activated (nobody on seat) Or seat switch momentarily deactivated while accelerator pedal being activated during forward / reverse operation.	* Machine will not drive.	* Ensure accelerator pedal is not activated without seat switch being activated. Ensure firm contact with seat by operator at all times while accelerator is pressed.	* Operator to be trained.	
* 7 Bars flash twice with pause.	* Emergency stop has been activated. * Off aisle cleaning activated with floor tool raised.	* Inadvertent pressing of emergency stop or activation of off-aisle cleaning mode.	* Machine will not drive.	* Ensure emergency Stop button has not been activated and off aisle vac switch is in off position with floor tool raised.	* Reset emergency stop button. Switch off aisle vac and raise floor tool. * Cycle key switch to resume normal operation.	
* 7 Bars flash 3 times with pause.	* Vac Motor system short circuit.	* Vac motor wiring fault / motor fault.	* Vac motor will not operate.	* Check vacuum motor and wiring	* Replace motor and any damaged wiring. * Cycle key switch to resume normal operation.	
* 8 Bars flash continuously. 	* Control system trip.	* Seat switch failure.	* Machine does not operate.	* Check seat switch wiring.	* Replace wiring as required.	
* 9 Bars flash once with pause. 	* Flashing beacon failure to operate.	* Beacon short circuit.	* Flashing beacon does not operate in accordance with safety requirements.	* Check wiring and connections to device.	* Replace damaged components. * Cycle Key switch to resume normal operation.	
* 9 Bars flash 3 times with pause.	* Water pump failure to operate.	* Failure of pump or wiring short circuit.	* No water supplied to cleaning heads.	* Check wiring and connections to pump.	* Replace damaged components. * Cycle Key switch to resume normal operation.	
* 9 Bars flash 4 times with pause.	* Detergent pump failure to operate.	* Failure of pump or wiring short circuit.	* No detergent supplied in water mix to cleaning head.	* Check wiring and connections to pump.	* Replace damaged components. * Cycle Key switch to resume normal operation.	
* 9 Bars flash 5 times with pause.	* Solenoid brake circuit failure.	* Failure of solenoid or wiring.	* Machine will not move.	* Check wiring and connections to brake.	* Replace damaged components. * Cycle Key switch to resume normal operation.	
* 10 bars flash continuously 	* Supply voltage to controller has exceeded 40 volts.	* Battery and motor connections may have become loose.	* Possible long term damage to controller if fault persists.	* Check battery wiring, trio drive and motor connections.	* Replace damaged components. * Cycle Key switch to resume normal operation.	
* Bars cycle up and down continuously (from 1 to 10 and 10 back to 1) and repeats.	* Accelerator pedal movement detected during Vario start up sequence (partially pressed or jammed).	* Foot or object on pedal during switch on or possible jamming of pedal.	* Machine will not operate.	* Remove object and ensure pedal is not jammed or depressed during switch on of Vario.	* Cycle Key switch to resume normal operation .	
* Bars cycle from 1 to 10 continuously and repeats.	* Machine inhibit.	* Controller/harness incorrectly wired.	* Machine will not operate.	* Check controller and harness wiring with special attention to wires p2/03 and p2/10.	* Correct wiring. * Cycle Key switch to resume normal operation	
* No indication on display.	* Horn and beacon failure.	* Replace 20 Amp fuse (if this doesn't fix fault replace horn or beacon)				
* No indication on display.	* Brush motors continuously either off or on while in transport mode.	* Microswitch failure.	* Brushes will not operate correctly.	* Check wiring and microswitch on underside of machine by brushes ensuring microswitch is clear of debris.	* Replace/clean damaged components.	
* No indication on display.	* VAC motor continuously either off or on.	* Microswitch failure.	* Vacuum will not operate correctly.	* Check wiring and microswitches behind floor tool handle.	* Replace/clean damaged components.	

## Trouble Shooting

PROBLEM	CAUSE	SOLUTION
Machine will not operate	Missing or blown fuses Key in position '0' (OFF) Low battery charge Machine isolator button in 'OFF' mode Machine is connected and charging Waste tank full switch stuck or clogged	Fit or replace fuse (page 8) Turn key to position '1' (ON) (page 8) Charge batteries (page 20) Reset isolator (page 17) Take off charge (page 20) Inspect and clean switch (page 16 / 18)
Vacuum will not operate	Floor-tool in raised position Waste-water tank full	Lower floor-tool (page 14) Empty waste-water tank (page 18)
Poor water pick-up	Waste-water tank full Clogged / blocked vacuum hose Loose hose connections Debris basket filter clogged / blocked Separator filter clogged / blocked Poor separator seal Damaged separator seal Damaged / split vacuum hose Damaged floor-tool blades Low battery charge	Empty waste-water tank (page 18) Remove and clean (page 18) Push tight connections (page 9) Remove and clean (page 18) Remove and clean (Page 18) Clean and refit (page 18) Renew (contact service dept) Renew (contact service dept) Renew (contact service dept) Recharge batteries (page 20)
No brush / scrub function	No brushes fitted Brush deck raised	Check and fit (page 11) Lower brush deck (page 14)
Little or no water flow	Clean-water tank empty Clean-water tank filter blocked/ clogged Incorrect water flow setting Brush deck raised	Fill clean-water tank (page 12) Remove and clean (18) Adjust as desired (Page 15) Lower brush deck (page 14)
Little or no dosing solution flow	Chemical dosing tank empty Incorrect dosing flow setting	Fill dosing-tank (page 13) Adjust as desired (page 15)
Machine just 'stops' while operating	Too much load on the brush system	Reset the machine using the key and decrease the brush load to best suit the floor type (page 16)
Machine will not operate in reverse	Floor-tool in lowered position 'Causes Battery Indicator to Flash'	Raise floor-tool (page 14)

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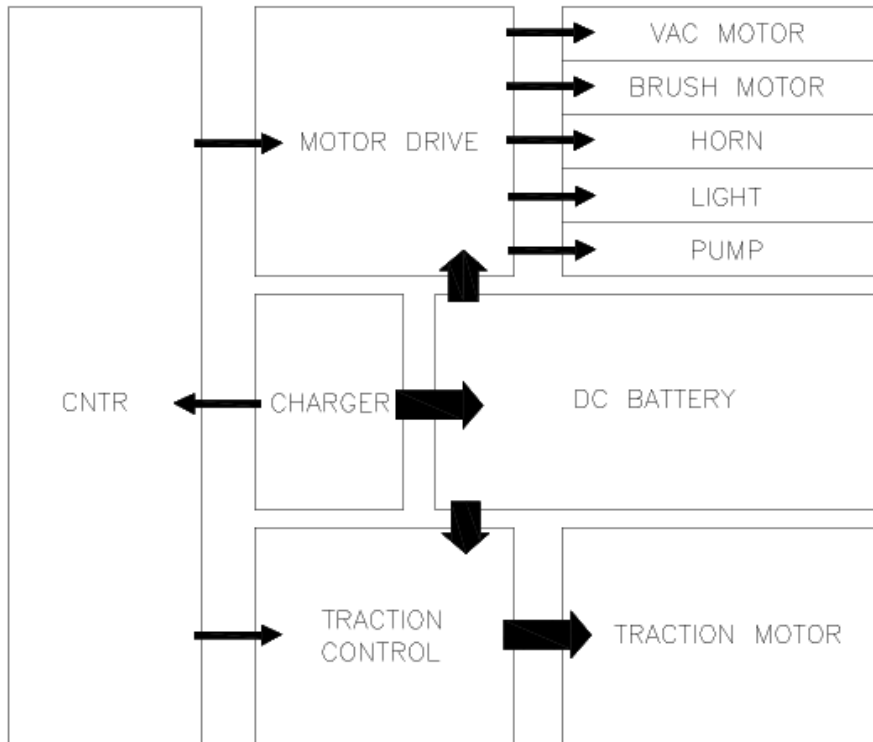
## Specifications

Brush Motors	Vac Motor	Power	Noise Max decibel level at 1 meter	Run Time	Charging Time	Traction Drive	Transit Speed	Cleaning Speed	Climbing Gradient	Scrub Widths
3 x 24V 400 W	24V 600 W	6 x 12V = 300 Ahr	≤ 70 dB(A)	3.5 hrs	8-12 hrs	600 W	0-7.0 km/h	0-3.5 km/h	11%	650 mm 750 mm 850 mm
Brush Speed	Water Capacity	Nuchem Capacity	Water Flow rate	Nuchem Mix	Gross Weight (Full)	Gross Weight (Full) Plus 75KG Operator	Hand Arm Vibration Measurement	Whole Body Vibration Measurement	Dimensions	
50/100 150/200 rpm	120 L	5 L	4 L/min 3 L/min 2 L/min 1 L/min	25:1 50:1 75:1 100:1	620 Kg	695 Kg	2.1 m/s <sup>2</sup> (BS EN ISO 5349) Uncertainty 1%	0.525 m/s <sup>2</sup> (ISO 2631-1) Uncertainty 1%	H x 1425 mm L x 1676 mm W x 1054 mm	
RTU Weight	RTU Weight + 75Kg Operator		NET Weight	NET Weight Less Batteries		Battery Weight	Battery Dimensions			
620 Kg	695 Kg		500 Kg	315.2 Kg		30.8 Kg	H - 210mm L - 330mm W - 170mm			

## Spare Parts & Accessories

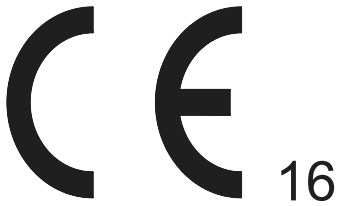
<b>BRUSHES:</b>		<b>GENERAL PARTS:</b>	
<b>606174</b>	330mm Octo Polyscrub Brush	<b>206953</b>	Detent Pin
<b>606172</b>	330mm Octo Nyloscrub Brush	<b>208167</b>	Spare Set of Keys (2 Keys)
<b>606176</b>	330mm Octo Longlife Brush	<b>208165</b>	Bulb
<b>606407</b>	330mm Padloc Octo Drive Board	<b>280001</b>	Seat Cover
<b>SQUEEGEE:</b>		<b>206947</b>	Splash Skirt
<b>900523</b>	Complete 850 Squeegee Assembly	<b>206939</b>	Rear Wheel
<b>900520</b>	Squeegee 850 Blade Set - Serilor PU FR & RR	<b>303827</b>	38mm Dosing Tank Cap
<b>208497</b>	Squeegee Castor	<b>304456</b>	42mm Dosing Tank Cap
<b>208796</b>	Squeegee Buffer Wheel	<b>220386</b>	Charging Lead V17 - UK
<b>FILTERS:</b>		<b>221079</b>	Charging Lead V34 - EURO
<b>208360</b>	Weighted Filter	<b>221047</b>	40 AMP Maxi Fuse
<b>208417</b>	Filter Basket	<b>DRIVE MOTOR SPARE PARTS:</b>	
<b>206439</b>	Basket Filter	<b>321450</b>	Drive Wheel Unit
<b>208790</b>	Bottom Tank Filter	<b>321506</b>	Brake
<b>206265</b>	Barrel Filter (Separator)	<b>208145</b>	Wheel
<b>HOSES:</b>		<b>208146</b>	Armature Brush
<b>213059</b>	Floor Tool Hose	<b>208147</b>	Motor Brush
<b>213060</b>	Vac Hose	<b>208148</b>	Friction Disc
<b>280018</b>	Top Tank Hose	<b>208149</b>	Rubber Gasket
<b>213025</b>	Bottom Tank Dump Hose	<b>208151</b>	Pinion
<b>304439</b>	Hose Closure (Bottom Tank)	<b>208152</b>	Steering Chain
<b>900903</b>	Hose Closure (Top Tank)	<b>208153</b>	Steering Chain Master Link
<b>237718</b>	Hose Guide		

# TTV 678 - Schematic Diagram



## Notes

# Notes



**EU DECLARATION  
OF  
CONFORMITY**

We hereby declare under our sole responsibility that the following equipment fulfils all the relevant provisions of the following EU Directives:

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Machinery Directive 2006/42/EC

EMC Directive 2014/30/EU

RoHS Directive 2011/65/EU

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**Machine Description:**  
**Type: TTV, TRO, CRO series**

**Scrubber Dryer**

**Manufactured by: Numatic International Limited**

Relevant standards upon which conformity is declared include:

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IEC 60335-1 2001 + A1 2004 + A2 2006 + National  
Deviations  
IEC 60335-2.72 Ed 2.0

EN 55014-1:2006  
EN55014-2:1997+A1  
EN61000-3-2:2006  
EN61000-3-3:1995+A1+A2  
BS EN 62233:2008

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A technical construction file for this equipment is retained at the manufacturer's address under the authorisation of the following signatory:

**Name: Allyn Boyes**

**Position: Technical Manager**

Signed:

Date: 20/04/2016



Numatic International Limited,  
Chard, Somerset.  
TA20 2GB  
www.numatic.co.uk

**GB**

# **Numatic International** *Warranty*

**Numatic International Limited warrant to the original purchaser that its products are free of defects in both material or workmanship for the period shown below:-**

<b>Homecare and Cleancare Vacuum cleaners.....</b>	<b>2 Years</b>
<b>Rotary Floor Machines.....</b>	<b>2 Years</b>
<b>Twintec Auto Scrubber Dryer.....</b>	<b>1 Year</b>
<b>Vario Ride-On Scrubber Dryer.....</b>	<b>1 Year / 1500 hours</b>
<b>Mopping, Compacts, Combi and Servocare Products.....</b>	<b>1 Year</b>
<b>Individual Accessories and Spare Parts.....</b>	<b>6 Months</b>

Note: This warranty expressly excludes consumable parts such as carbon brushes, floor brushes, mops, batteries etc, that are considered replaceable from time to time during the normal working life of the machine.

A. The warranty period commences from the date the goods are purchased.

B. All warranty claims must be processed through the Dealer from whom the equipment was purchased. The Dealer will co-operate with the purchaser throughout the warranty claims procedure and will arrange any necessary repairs using genuine Numatic parts.

C. If the original Dealer is no longer able to fulfil his obligations please contact Numatic International Limited with full details of the claim and proof of purchase so that this may be processed without delay.

D. Any warranty claim can only relate to the specific part that is proven to be at fault and for which a replacement will be supplied but cannot be extended to constitute a claim against the complete machine.

E. Numatic International will supply the Dealer with any warranty parts required, subject to the claim being validated, after return of the faulty items in accordance with Numatic International Limited's General Conditions of Sale.

F. Claims will not be accepted if they are the result of fair wear and tear, misuse or abuse of any kind.

G. No replacement will be given unless the appropriate evidence of the validity of the claim has been provided to the satisfaction of Numatic International Limited.

H. Numatic International Limited reserve the right to charge for any unnecessary work carried out as a result of an invalid claim.

I. No variation to this warranty may be made or implied by any member of Numatic International Limited or its Dealers unless such variation is in writing and authorised by the Company



**Numatic International Limited. Chard, Somerset, TA20 2GB**  
**Telephone: 01460 68600 Fax: 01460 68458**

© Numatic International Limited

# TTV 678

This machine has been packed  
with the following:

Charging Lead

Fuses

Hose Hook

38 / 32mm Adaptor

Signed



Distributed by



Numatic International Limited  
Chard, Somerset  
TA20 2GB ENGLAND.  
Telephone 01460 68600 Fax: 01460 68458  
[www.numatic.co.uk](http://www.numatic.co.uk)

Subject to change without prior notice.

235470 05/17 (A18)