MUREX

Transtig AC/DC 203i
Transtig AC/DC 353i

Service Manual

1.7.99

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MUREX Transtig AC/DC 203I, 353i & T.W.C.U.

SERVICE MANUAL

KEYNOTES

- The 203i & 353i operate from balanced 3 phase 415V (±10%) 50/60Hz supplies
- They use inverter based IGBT technology with μP control
- Operator controls are a mix of rotary & keyswitch types
- In AC TIG mode HF is off whilst the arc is running
- Both AC balance & AC frequency can be set (10-90%, 20-200Hz)
- The LCD display gives preset &, whilst welding, actual values
- The 203i & 353i use identical primary inverter & Tx/Rect. PCB assemblies. The 353i uses 2 sets in parallel each delivering ½ of the output current
- The local/remote control selector is a potentiometer/switch. With the switch off, fully anticlockwise, the control is local. Turning the control up sets the machine to remote mode and enables the minimum current A_{min} set by the remote device, e.g. the FC-5B footcontrol, to be preset. **Note** the remote control must be connected for the remote A_{min} control to work correctly
- The T.W.C.U. operates from a 230V 1 phase supply (6.3A slow fuse) provided by the 203i or 353i via an internal rear panel mounted terminal board
- The T.W.C.U. contains a pressure switch which operates an audible and visible alarm if the coolant flow fails. The pressure switch is in the water return path and requires positive pressure to be OK

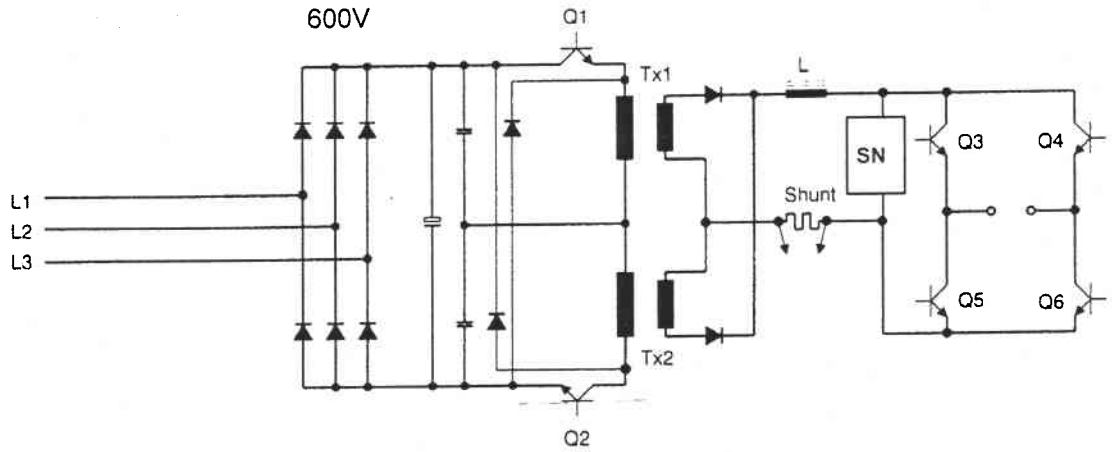
WARRANTY

The Transtig AC/DC 203i & 353i and the Transtig T.W.C.U. are guaranteed for 2 years from date of sale. Note that this warranty excludes torches, cables and hoses etc.

SAFETY

- **The extension pieces at the top of the rear uprights of the trolley unit must be removed in the case of the 203i**
- **When the 203i or 353i are mounted on the trolley unit do not remove the machine lid without first ensuring the unit cannot slide backwards off the trolley!**
- **High voltages are present inside the machines. The primary inverter PCB(s) have 600Vdc on them, even on aluminium heatsinks!**

BASIC PRINCIPLE OF OPERATION



QI to Q6 each comprise parallel sets of IGBTs, Insulated Gate Bipolar Transistors. For ease of understanding these are shown as single conventional NPN transistors in the above diagram.

The 3 phase 415V supply is rectified and smoothed creating a 600V dc line. This dc supply is then centre tapped by a pair of series capacitors (300Vdc each). IGBTs QI and Q2 alternately connect the primaries of high frequency transformers Txl and Tx2 to each of the 300V sources. Fast recovery diodes freewheel the inductive energy stored in each transformer. The basic switching frequency is around 60kHz and PWM control is used.

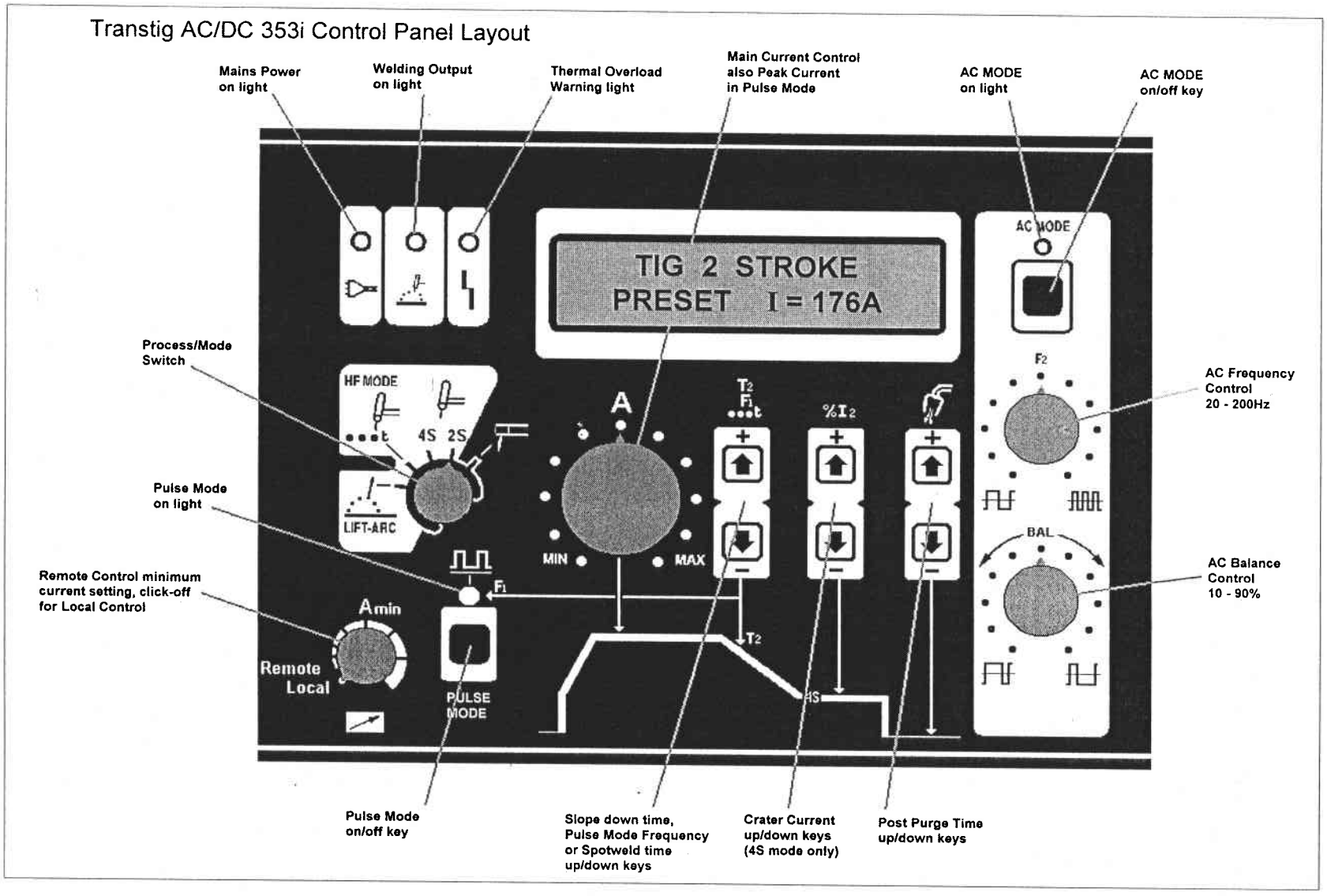
The secondaries of Txl and Tx2 are rectified using parallel sets of fast recovery rectifiers. A filter inductor L is included in the positive output and a measuring shunt in the negative. A spike suppression network SN is incorporated across the dc output.

IGBTs Q3-Q6 form a bridge (commutator) network. The polarity of the output can be set +ve or -ve by switching on both Q3 and Q6, or both Q4 and Q5 as required. Switching the diagonal pairs on alternately creates a square wave ac output whose frequency and balance can be continuously adjusted.

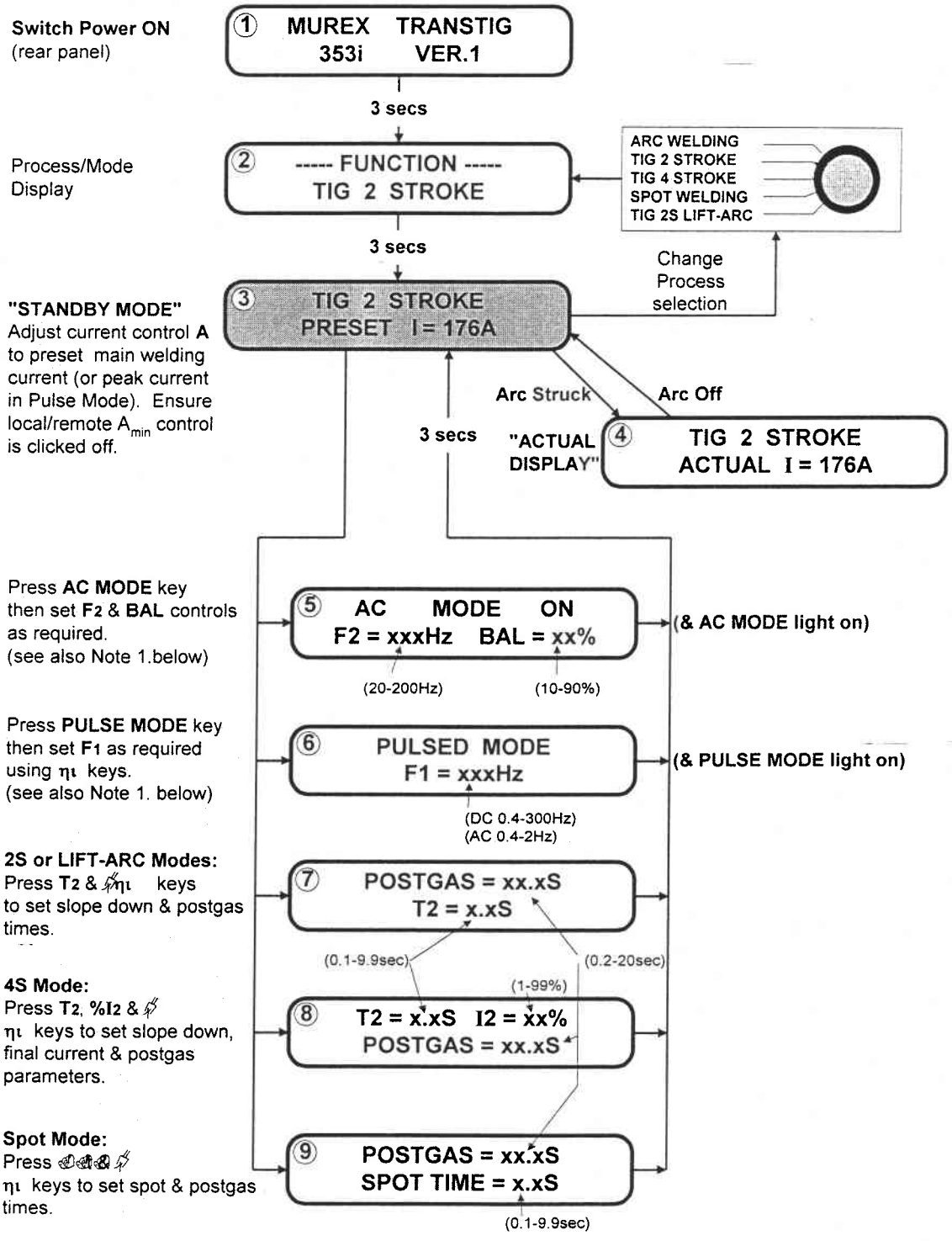
TECHNICAL SPECIFICATION

	AC/DC 203i	AC/DC 353i
Input:		
Mains Supply	415V, 3 Phase, 50/60Hz	415V, 3 Phase, 50/60Hz
Fuses	16A slow	32A slow (20A slow up to 250A TIG)
KVA	6 (5.4kW)	14 (13kW)
P.F.	0.9	0.9
Output:		
TIG Rating	200A 40% duty	350A 40% duty
	160A 60%	300A 60%
	100A 100%	250A 100%
MMA Rating	190A 35% duty	320A 35% duty
O.C.V.	65V	65V
Controls:		
TIG Current	5-200A	5 - 350A
MMA Current	5-190A	5 - 330A
Minimum Current in Remote Mode	5-100% of main current	5-100% of main current
AC Frequency	20 - 200Hz	20 - 200Hz
AC Balance	10 - 90%	10 - 90%
Pulse Frequency	0.4 - 300Hz DC, 0.4 - 2Hz AC	0.4 - 300Hz DC, 0.4 - 2Hz AC
Pulse Time	33% of cycle time*	33% of cycle time*
Background (when pulsing)	25% of peak current*	25% of peak current*
Slope Down Time	0.1 - 9.9 Seconds	0.1 - 9.9 Seconds
Slope Up Time (4S mode)	1.5 Seconds*	1.5 Seconds*
Start/Crater Current (4S mode)	1 - 99% of main current	1 - 99% of main current
Pre Purge Time	0.5 Seconds*	0.5 Seconds*
Post Purge Time	0.2 - 20 Seconds	0.2 - 20 Seconds
Spot Weld Time	0.1 - 9.9 Seconds	0.1 - 9.9 Seconds
Arc Force/Hot Start (MMA)	35%*	35%*
Dimensions: (Power Source)		
Height	510mm	520mm
Width	240mm	290mm
Depth	500mm	540mm
Weight	25kg (Net)	34kg (Net)
Standards:	EN60974-1 & EN50199	EN60974-1 & EN50199
	* Other values on request	* Other values on request

Transtig AC/DC 353i Control Panel Layout



Transtig AC/DC 353i LCD Display Modes



Note1. To revert to DC, or to cancel Pulse Mode, at the main menu press and hold either the AC MODE key or PULSE MODE key for roughly 3 seconds until the light above it goes off