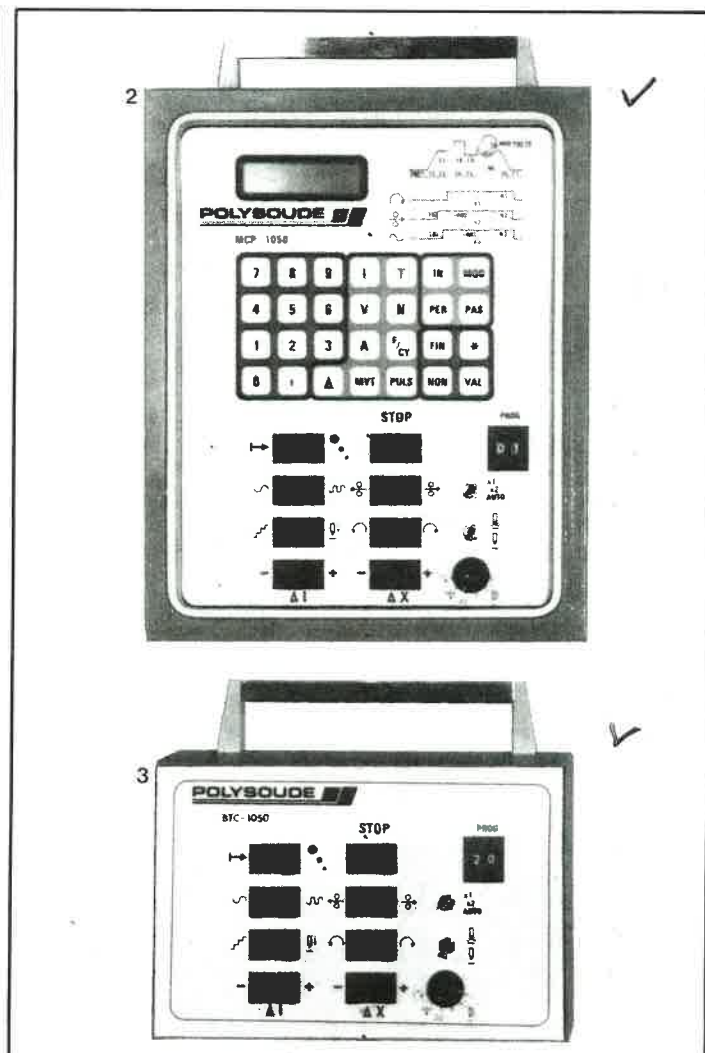
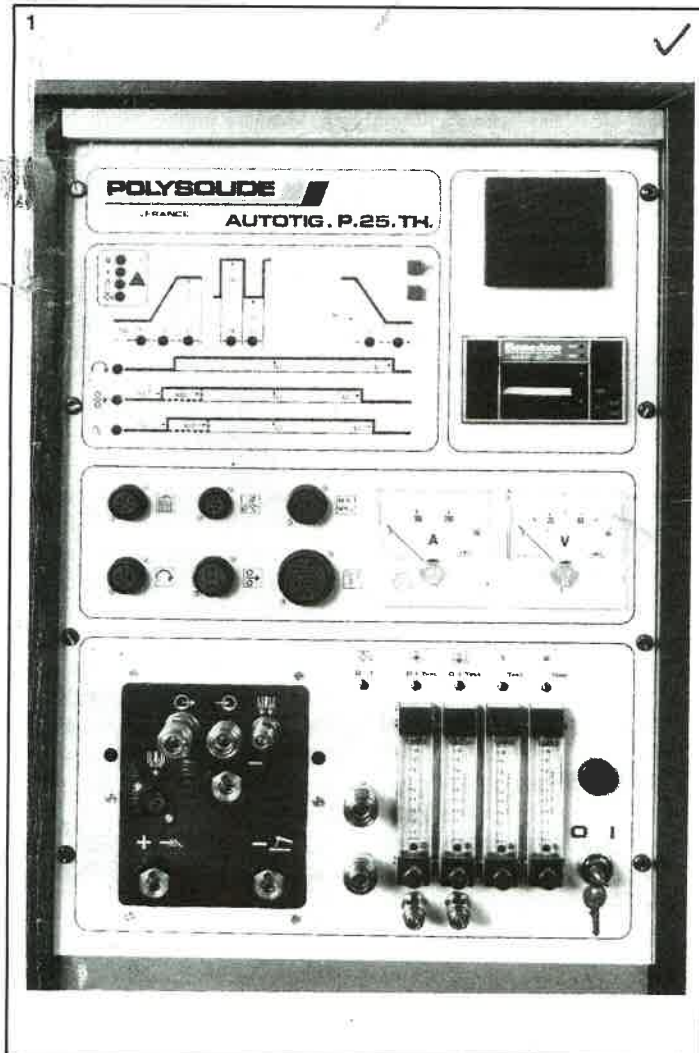


POLYSOUDE

AUTOTIG® P 25.TH P 30.TR

- High precision automatic welding units including:
 - . D.C. power source for TIG welding with pulsed current,
 - . programme sequence control,
 - . auxiliary function control (wire feed and welding head movements).
- An option of two power source types :
 - . P 25.TH - Thyristor control,
 - . P 30.TR - Transistor control.
- Welding sequence and current profile controlled by micro-processor.
- Simple or complex programmes stored in sequence, with easy recall. The number of programmes in memory is limited only by the complexity of the individual programmes or by the total capacity of the memory.
- Entering the programme parameters either digitally from the portable programming unit or by transfer from magnetic tape* (micro cassette).
- Programme verification. Hard copy* - print out of a parameter listing (for quality control and reference file). Programme storage*. Recording of the programme(s) in memory onto a magnetic tape, (digital micro cassette). (Each cassette is supplied in a plastic case for protection and ease of storage).
- Compatible with all POLYSOUDE welding heads for :
 - . Butt welding of tubes,
 - . Welding of tube to tube plates.
- Remote control either from the portable programming unit or from the hand control box.
- Modification of welding current and movement parameters during the welding cycle by preselected incremental values.
- Connection to special welding equipment and robots by means of an interface, designed to meet the requirements of the system.

- 1 - AUTOTIG P25.TH
2 - Portable programming unit
3 - Hand control box



* OPTIONS

Welding current

TIG welding with pulsed current is one of the most adaptable processes for welding thin or medium thickness materials. By virtue of its excellent controllability it is particularly suited to the welding of fixed position tubes (orbital welding), and even more so when the acceptance standards for quality are very strict. When using pulsed current, the front of the current peak must allow a deep enough penetration without excessive heating of the work piece edges. This current profile depends on the type of material being welded, in particular its thermal conductivity and the mass effect of the workpiece. In critical applications, a very rapid pulse ($f > 500$ Hz) (called metallurgical pulsation) can be superimposed on top of the normal pulsed current. Thereby giving a higher welding current but of a very short duration, allowing better control of the weld pool and to act on the metallurgical structure of the melted metal. The control system of POLYSOUDE power source ensures a very precise control of the parameters which determine the pulse shape, current

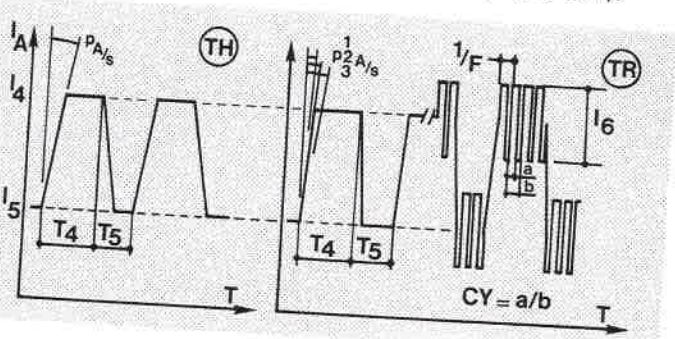
levels and dwell times, thereby allowing selection of the optimum current characteristics.

■ Thyristor power sources (P25.TH)

Due to its six phase rectifier, this power source delivers a D.C. welding current with very low ripple. The slope of the current is approximately 100 ms/250 A and allows for (as already proven with the AUTOTIG 250 SE equipped with the same power source) a wide range of orbital welding applications.

■ Transistor power source (P30.TR)

This original POLYSOUDE power source, as used on the AUTOTIG 158 SE, has already proven without exception its high performance capabilities. The series transistor principal, with linear amplification ensures a ripple lower than 1 %, the pulse upslope can reach 150 μ s/240 A. The leading and trailing edge of the pulse (attack and decay) may be adjusted as required against three values. The fast pulsation is (I4, I5) determined by the amplitude of the current variation (I6) on two levels, by the pulsation frequency (F), and the operating cycle (CY).

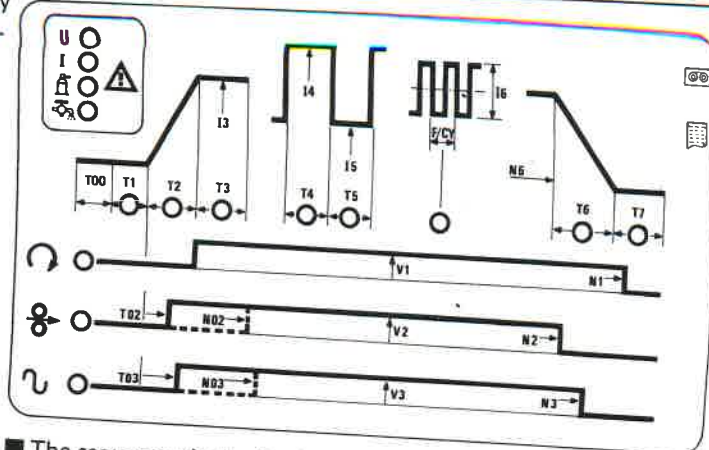


* OPTIONS



AUTOTIG P 25.TH

The sequence



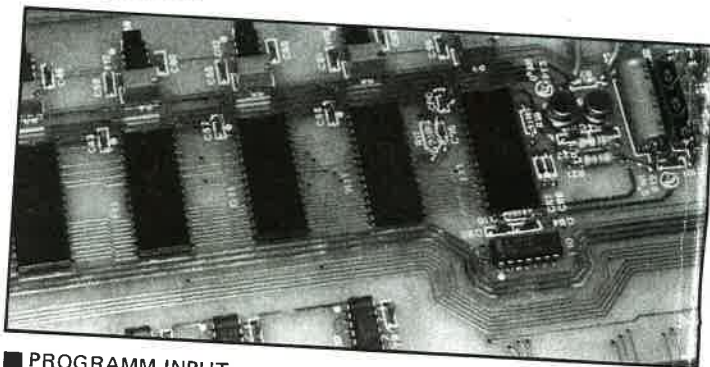
■ The sequencer is the "order giver" of the machine. It dispatches to the different control systems, all the instructions necessary to complete the weld cycle in respect to the actual position of the torch along the joint. This is achieved by "real time" monitoring of the weld cycle using the patented movement impulse system.

With AUTOTIG P25.TH and P30.TR, the sequence can also run if required under the control of an internal quartz timing device.

■ The sequencer with its micro-processor controls the following functions :

- . Welding current (shape, upslope, welding & downslope),
- . Wire feed,
- . Torch movement along the joint,
- . Weaving across the joint*,
- . Electrode to workpiece distance*.

■ All functions are feedback loop controlled, ensuring the highest possible degree of accuracy and repeatability.



■ PROGRAMM INPUT

All the parameters used in a particular programme can be entered into the memory of the machine either direct from the keyboard or via a micro cassette*.

Each sequence when in store, is designated with an identity number. A liquid crystal display allows visual access to the stored information.

■ MODIFICATIONS

Modification of parameters can be obtained :

- . Before starting the sequence by using the function key MOD on the programming unit.
- . During welding (real time modification) with or without alteration of the actual value in memory. This function is of extreme value for the development of welding procedures.

Modification by operator during production welding :

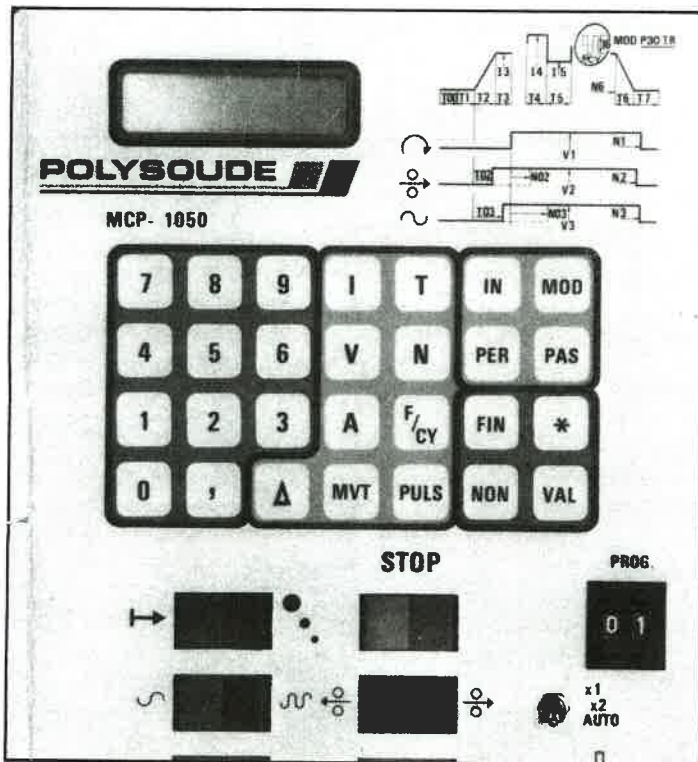
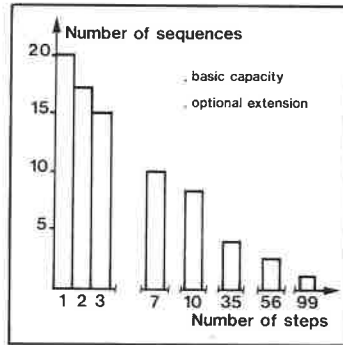
. During the writing of a welding programme it may be decided that the operator should have control of certain parameters within fixed limits, in order to compensate for possible variations.

With these equipments, it is possible to preselect parameters and instruct the machine to allow a variation of a known amount above or below the accepted level. Each of these modifications made by the operator is by incremental adjustment the size of which is determined during the writing of the programme. The modification of any of the preselected parameters is controlled by depressing the corresponding button on the remote control unit.

Programming

- "Programming" means :
 - . The introduction in sequence, of all the parameters necessary for a complete welding operation, from striking to switching off the arc.
 - . The storing of information to be used for executing multi-pass welds, and/or different one pass welds.
 - . The automatic modification of parameters during welding as dictated by the programme sequence.
- A sequence consists of a number of different steps, a step being a period where the parameters remain unchanged. Controlling a step requires the execution of an instruction in memory by the sequencer. The quantity of steps depending on the number of parameters and functions in use.
- A feature of the programming on the AUTOTIG P25.TH and P30.TR is that

the only limit for the number and type of programme steps is the total capacity of the machine memory. The programme steps, simple or complex are written and stocked one after the other.



- DOCUMENTATION

The AUTOTIG P25.TH and P30.TR power sources incorporate a printer* that will give a parameter listing for each sequence stored in memory. This listing is a useful document for welding procedure acceptance and for quality control. All welding programmes can be stored on magnetic tape* (micro cassette) it is therefore possible to establish a programme library containing a tape and printed listing of each application.

Instructing the machine to access information from a prerecorded cassette,* allows the operator to set up the machine very quickly without any risk of error, even for the most complicated programmes. A conventional multichannel recorder can be connected via a socket on the power source, allowing analogic signals for current, voltage and welding speed to be recorded.

Utilization

- OPERATION

Two working modes are possible :

 - . For developing and writing welding procedures all functions are controlled from the portable programming unit MCP 1050.

For fabrication welding with predetermined procedures stored in memory, controlled from the remote control box BTC 1050 allowing :

 - . The selection of the required programme identified by its reference number.
 - . Start of automatic welding sequence.
 - . A limited and incremental modification of certain parameters for which value has been preset.
 - . Forward and retract of filler wire.
 - . Rotation of the welding head.
 - . Manual override of slope out sequence.

- ADDITIONAL FUNCTIONS

Gas.

For welding with gasses other than Argon where arc striking may prove difficult. Incorporated in the machine is an automatic gas change over device, allowing the arc to be stuck in Argon and immediately switching to the required shielding gas.*

Purge gas, the sequencer also controls a separate gas circuit for the internal purge gas.*

Additional torch shielding gas for further protection (i.e. for titanium) is provided for.*

All shielding gasses are con-

trolled via flowmeters fitted on the front panel of the power sources.

- WATER COOLING

As standard the AUTOTIG P25.TH and P30.TR are fitted with a water circulating and cooling system. However it is possible (if specified at the time of ordering) to incorporate a secondary water circuit for additional cooling, i.e. auxiliary tooling.

- TEST CYCLE

Preliminary test of gas flows, wire feed and torch movement by switching out the welding current and completing a "dummy run". The cycle is displayed on the synoptic front panel of the power source by means of indicator lights. An individual aid to "proving" a programme.

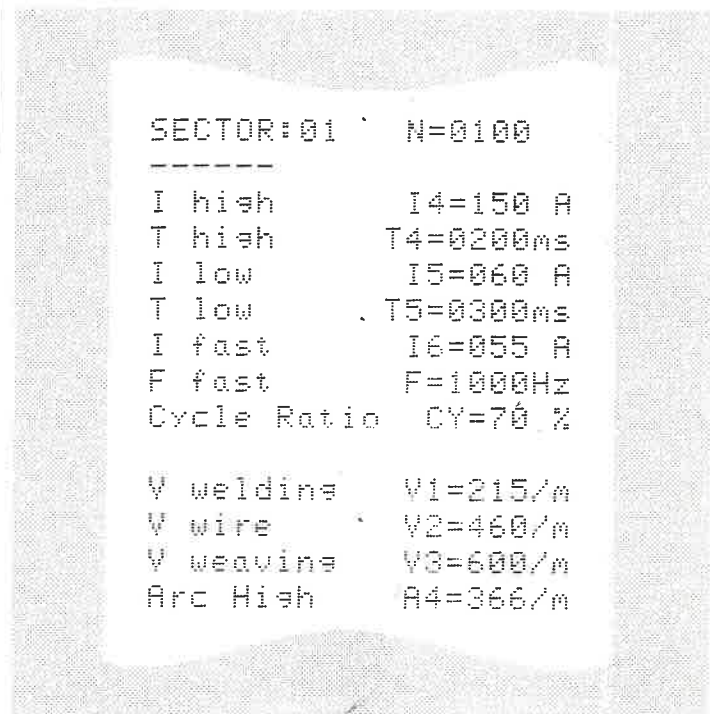
- SECURITY

The power sources are fitted with security devices that constantly monitor functions such as gas, water temperature etc. In the event of a fault in a particular circuit the fault is indicated by a LED against the appropriate symbol. Welding cannot recommence until the fault has been traced and rectified.

- TACK WELDING

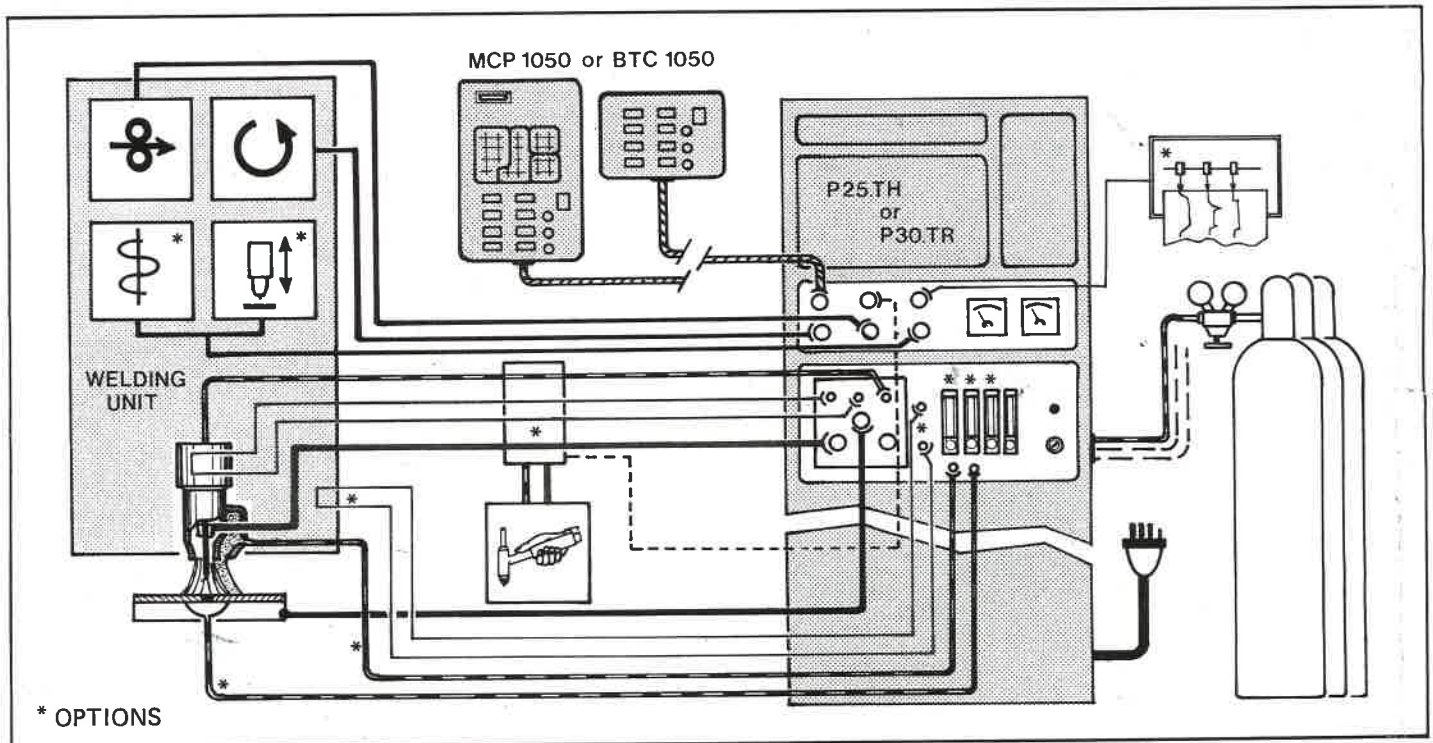
The power circuitry can be adapted to allow an additional function (e.g. manual welding torch) with using of a special kit box.* Therefore tack welding is made easy by immediate access to parameters contained on a tack weld programme.

* OPTIONS



Technical characteristics	AUTOTIG P 25.TH	AUTOTIG P 30.TR
Mains voltage (3-phases 50/60 Hz)	. 220/380/440/500 V	. 220/380/440/500 V
Input power	. 10 KVA	. 15 KVA
Open-circuit voltage	. 100 V	. 70 V
Current range	. 5 to 250 A	. 3 to 300 A
Current setting accuracy	. 60 % to 250 A	. 60 % to 300 A
	. 100 % to 190 A	. 100 % to 240 A
Constancy		. $\pm 1\%$ or $\pm 1\text{ A}$
Thermal pulsation range	. 5 to 250 A	. 3 to 300 A
Dwell time at I_H or I_B	. 100 to 9999 ms	. 10 to 9999 ms
Fast pulsation range		. 3 to 300 A
Fast pulsation frequency		. 50 to 10000 Hz
Effective frequency for 30/270 A		. 3000 Hz
Duty cycle for fast pulsation		. 10 to 90 %
Power source cooling		. *forced air
Welding tool cooling		. . recirculating water*
Gas control		. built-in security and flow-meter
Auxiliaries		. torch movement and wire feed
		. torch weaving* and arc length control*
		. magnetic tape*
		. printer*
Programme safeguard		. portable compact case
Listing		. remote control box
Programming		. 6 Ko of 8 Ko RAM to be programmed by the user
Automatic and manual control		. 18 Ko of 20 Ko RAM to be programmed by the user*
Memory capacity		. 560 x 800 x 1520 mm
Dimensions (L x w x h)		
Weight (approx.)	. 320 kg	. 350 kg

*OPTIONS



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