Operation manual

Electrolytic marking unit

EMP / MODULMAT

Ö S T L I N G
Markiersysteme GmbH

Broßhauser Str. 27
42697 Solingen - Deutschland

Tel.: +49 (0) 212 - 26 96 0
Fax.: +49 (0) 212 - 26 96 199

www.ostling.com

Edition: 01/2005

The document was written in the **Technical documentation department** *of the company ÖSTLING Markiersysteme GmbH.*

Table of contents

1 Safety

With the EMP/MODULMAT you have an electrolytic marking system, which is on the newest state of the art concerning safety and which is reliable in service.

We confirm to you with the EEC conformity explanation and the CE-indication at the equipment that the EMP/MODULMAT corresponds to the fundamental safety and health requirements of the EEC machine guideline 98/37/EG.

The type plate is together with the CE-indication on the back of the equipment.

We as manufacturers of the marking equipment want to make you familiar as operators by an extensive safety chapter with the safety concept of the equipment and refer to possible dangers and measures.

Note
Consider the generally accepted safety and rules for the prevention of accidents going beyond these references.

1.1 Definitions

Danger area ... is the range in the periphery of the marking equipment, in which safety or the health of a person is endangered by the stay in this range.

User ... is the person, in whose working area the marking equipment is set up and operated.

Operator/ Personnel ... are the persons, who are responsible for transport, list, start-up, enterprise, maintenance including cleaning and repair of the marking equipment.

1.2 Operational safety

The marking equipment is built according to the state of the art and reliable in service.

From this marking equipment however dangers can proceed, if it is used by not trained personnel inappropriately or to not intended use. Therefore threatens:

- Dangers for the safety of the operator.
- Impairment of the marking equipment and further real values of the user.
- Impairment of the efficient work of the equipment.

Intended use of the marking equipment

The EMP/MODULMAT is an electrolytic marking system for marking products with electrically leading surface.

Intended use means in addition:

- The installation of the marking equipment and its operation must stand in conformity with the valid national regulations of the user country. For their observance the user is responsible.

Impermissible is:

- Arbitrary changing or changes of the marking equipment by the user or operator.
- Each function, which could impair safety.

It is possible to interconnect the parts of the equipment so that a short-circuit is manufactured. This is e.g. the case, if the marking head contacts the baseplate during the marking or if the positive cable is connected directly with the negative cable. Such functions are generally inadmissible!

Danger of a short-circuit!

High current flow. Safety device is destroyed.

➢ The marking head may not come into contact with the baseplate.

No liability with not intended use!
Each use going beyond that is not considered as intended. For material damage and personal injuries resulting from this the manufacturer is not responsible; the risk for this carries alone the user.

1.3 Measures taken by the user/operator

Consider warning plates and references

With the operation of the marking equipment also actions are to be implemented, from which dangers can proceed. In this manual the instructions for implementing such actions warning references are placed in front. At the equipment are in addition appropriate warning plates.

Note
Mind the warning references!

Mind the commands and interdictions of the warning references. They serve your protection.

These warning references include:

- A symbol.
- References to the source and kind of the danger.
- Instructions, how you can avoid the danger.

Example:

Electrolytes are oxidizing substances!
Danger of poisoning.
➢ Do not swallow the electrolyte and do not bring it on the mucous membranes or eyes.

Personnel instruction

The marking equipment may be served, waited and repaired only by authorized, trained and instructed personnel.

Work on the electrical and pneumatic equipment may be implemented only by particularly trained specialists.

In addition the following measures must be accomplished, before the personnel takes up the work on the equipment:

- Instruct over arising dangers.
- The user must obligate, to the extent necessary, the personnel for carrying protective clothing and gloves.
- Competencies for operation, maintenance and repair must be clearly specified, so that under the aspect of safety no unclear authority arises.
- Read the technical documentation of the equipment. It is recommended to the user to be confirmed in writing in each case that the personnel read and understood the technical documentation.

Duty to care in handling the equipment

Guarantee perfect condition of the equipment:

- The user and/or the circle of acquaintances assigned by him may operate the equipment exclusively in the perfect condition.
- The user must ensure cleanliness and clarity of the work place at the equipment by appropriate instructions and controls.
- The user must provide for sufficiently admission of fresh air in the work spaces.
- The operator must announce occurring changes (including the operational behaviour) at the equipment, which impair safety, immediately to the user. In addition the equipment must be examined at least once per shift for outwardly recognizable lack and damage.

With all work, that concern transport, installation, start-up, operation, maintenance and repair, the prescribed switching off procedures must be kept:

- With all adjusting, maintenance and repairs the equipment must always be switched off over the MAIN SWITCH. Exceptions of it, with which the equipment must remain switched on with appropriate work, are noted in the manual in each case.
- With work on pneumatics:
  - Turn off and lock the compressed air supply.
  - Wait at least 5 s after turning off the compressed air supply, until the pressure diminished itself.
  - Examine whether the operating pressure dropped on 0 bar. Read off the current operating pressure from the appropriate manometer.

Use of intended spare parts and operational funds

Original parts and accessories are particularly conceived for the marking equipment. Spare parts for original parts and accessories, which are not supplied by the manufacturer of the marking equipment, are not examined and approved of the manufacturer. The installation and/or the use of such products can change therefore perhaps constructionally given characteristics of the marking equipment and endanger safety.

Note
For damage, which results from the use of non-original parts and accessories and/or not adequate installation or exchange of original parts and accessories, each liability of the manufacturer is impossible.

When using the intended operational funds the instructions for use must be kept. As far as a safety data sheet (European guideline 91/155/EWG) of the manufacturer for operational funds is prescribed, the references made there must be considered obligatorily, like e. g.:

- Chemical characterization.
- Physical and safety-relevant data.
- Transport.
- Regulations.
- Safety measures, Storage and Handling.
- Measures to be taken in case of fire and accidents.
- Toxicological information.
- Ecological information.

This applies in particular to the adequate disposal of operational funds. For this the safety data sheet indicates the prescribed kind of disposal and the waste key. The safety data sheet can be requested with the manufacturer of the operational funds.

Water protection

In the Federal Republic of Germany the concern principle applies to devices with water-endangering materials. This means that by handling these materials no impurities of waters may arise. This is the central statement § 19 of the water conservation law (WHG). In plant regulations (VAwS) and administrative regulations (VVAwS) of the states of the Federal Republic one concretizes, as is to be followed this concern principle.

Substance hazardous to waters	Electrolyte
Water pollution class	WGK 1
Volume of the substances hazardous to waters	≤100 l
Endangerment stage overall	A

Water protection information Tab. 1

1.4 Measures of the manufacturer

The marking equipment contains a transformer, which reduces the input voltage (AC) to max. 24V output voltage alternating current (AC) or direct current (DC). With intended use of the equipment therefore no voltage dangerous for humans is delivered by the equipment.

Due to the building method of the hand marking equipment it is possible to affect live parts during the marking. Due to the low voltage of max. 24V this is harmless.

Cardiac pacemaker

For persons with cardiac pacemaker also a voltage of max. 24V can become lethal, since the cardiac pacemaker is impaired in its function. For this reason the work with the marking equipment is forbidden for persons with cardiac pacemakers.

Danger of life for persons with cardiac pacemaker!

➢ Work with the marking equipment is forbidden for persons with cardiac pacemaker.

The electrolytes used depending upon marking type are oxidizing substances. In the case of their use the instructions for use must be kept (see page 8).

1.5 Danger overview

The following danger overview points out the substantial potential endangerments of lives and health by the equipment. By conceiving and design as well as the safety devices of the equipment according to the EEC machine guideline 98/37/EG an endangerment of the personnel is excluded. If the user of the equipment can seize additional measures for the reduction of possible remainder dangers, this is to be taken from the danger overview.

Type of endangerment	Spot of endangerment	Danger	Additional measure
Mechanical endangerment • By squeezing	• Contact pin	Risk of injury	-
Electrical endangerment • By electrical contact	• Contact with parts that are under voltage during the marking	Danger of life for persons with cardiac pacemaker	Persons with cardiac pacemaker are not allowed to work with the equipment.
Endangerment caused by substances • By contact along or inhalation of poisonous liquids, gases, nebulas, steams and types of dust	• Electrolyte	Risk of health	Do not swallow the electrolyte and do not bring it on the mucous membranes or eyes. Wash hands before pausing and after work.

Tab. 2

2 Product description

The EMP or MODULMAT is a semiautomatic marking system, with which the products are marked from above. The product to be marked lies on an adjustment block, during the marking the marking head is pressed pneumatically on the product to be marked. The marking takes place on the upper surface of the product.

Products with electrically leading surface can be marked. The marking takes place via a current pulse, which is led by the coinage of the stencil. Thus an accurate image develops on the product to be marked. The surface form of the product to be marked is arbitrary.

The EMP/MODULMAT consists of the following building groups:

- Marking control EU CLASSIC 300, EU CLASSIC 500, EU EXPERT 300 or EU EXPERT 500.
- Mechanics (electrolyte basin and -storage vessel, stand, product admission).
- Pneumatics.
- Electrolyte pump.

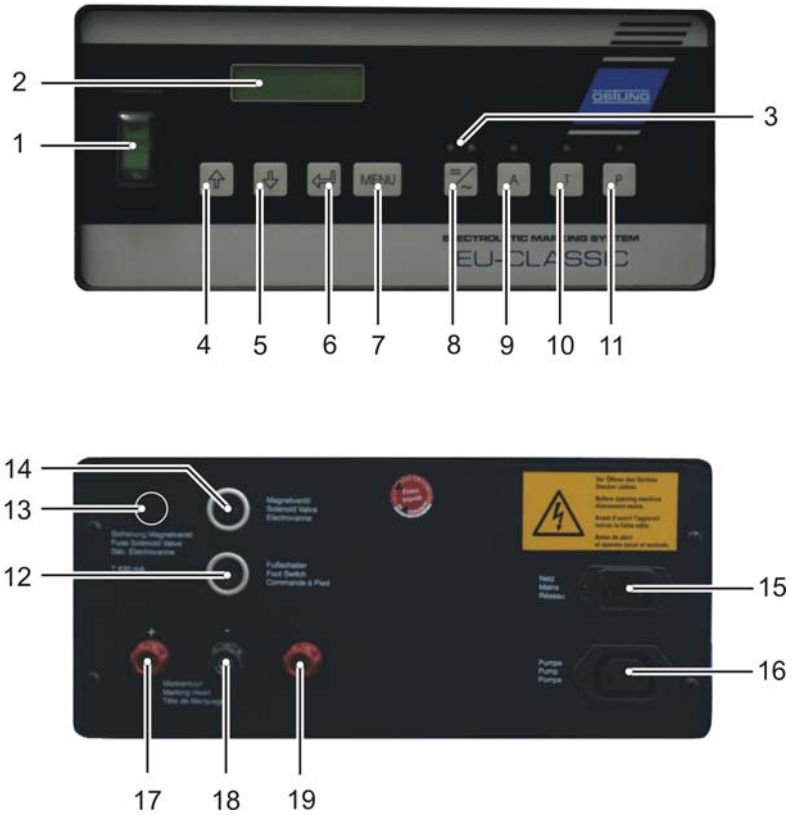
The input voltage of the marking control amounts to 115 V or 230 V alternating current (AC), the output voltage can be adjusted steplessly from 0 to 24 V alternating current (AC) or direct current (DC). Power output amounts to 310 VA or 510 VA.

2.1 Technical data of the control

			EU CLASSIC 300 EU EXPERT 300	EU CLASSIC 500 EU EXPERT 500
Input voltage		[V]	115 or 230, AC (see type plate)	115 or 230, AC (see type plate)
Output voltage		[V]	0 - 24, AC or DC	0 - 24, AC or DC
Power		[VA]	310	510
Dimensions	Height	[mm]	140	140
	Width	[mm]	380	380
	Depth	[mm]	220	220
EMV checked	EN 50081-1, EN 50082-1			

Tab. 3

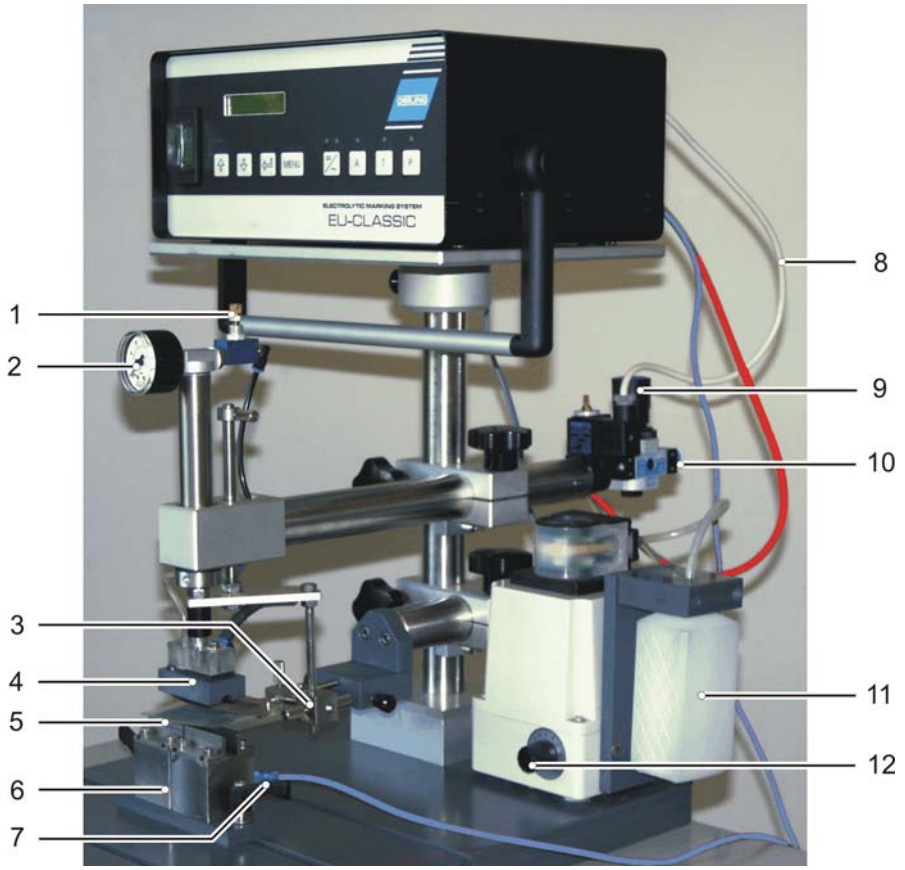
2.2 Operating devices and components



1	MAIN SWITCH	11	PUMP
2	Display	12	Connection foot switch
3	LEDs AC and DC	13	Fuse magnet valve
4	Pushbutton ↑ (increase values)	14	Output magnet valve
5	Pushbutton ↓ (decrease values)	15	Connection line cord
6	ENTER	16	Connection pump
7	MENU	17	Connection positive cable
8	Pushbutton AC/DC	18	Connection negative cable
9	AUTOMATIC	19	Hard metal output (option)
10	TIMER		

Operating devices EU CLASSIC / EU EXPERT Fig. 10009

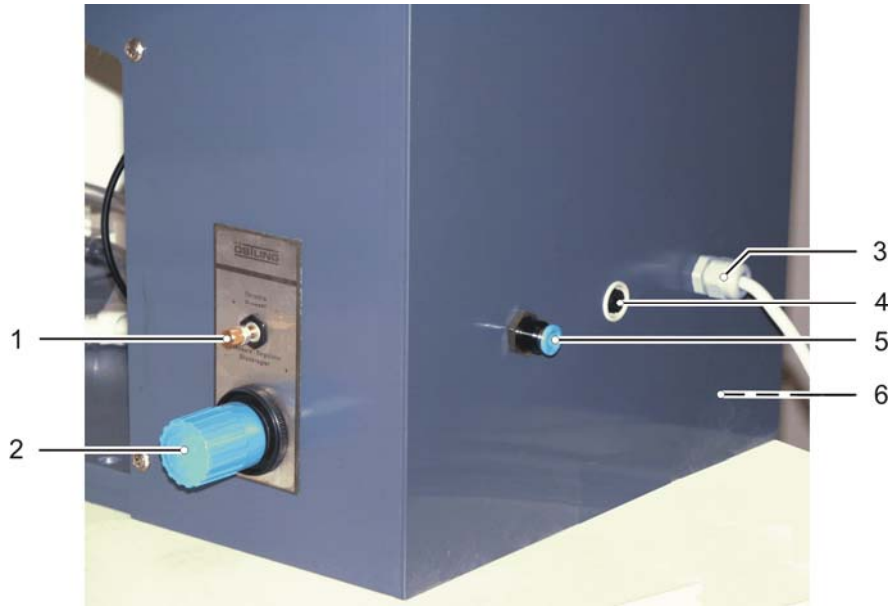
The grasp handle (not illustrated) serves for carrying and inclining/slanting the equipment. With pressure on the two lateral pushbuttons the grasp handle can be adjusted in 30°-steps.



1	Throttle cylinder speed	7	Connection negative cable
2	Pressure gauge	8	Cable and plug magnet valve
3	Stencil holder X-Y-Z	9	Pressure reducing valve
4	Marking head	10	Compressed air connection
5	Stencil glued on stencil cover	11	Electrolyte storage vessel
6	Adjustment block	12	Electrolyte fine dosage

Components EMP Fig. 10102

With MODULMAT, which is the compact design, control and mechanics are integrated into a plastic housing. Most connections are already factory-installed cabled. The connections at the back of the control are not accessible. The connections, which you as a customer must reach, are shifted on the back of the plastic housing:



1	Throttle for cylinder speed	4	Connection foot switch
2	Pressure reducing valve	5	Compressed air connection
3	Line cord	6	Connection pump (at the side)

Deviant components MODULMAT Fig. 10123

Note
Depending upon ordered design the appearance of the EMP/MODULMAT can deviate slightly from these illustrations.

2.3 Accessories

Hard metal output

The equipment can be supplied with an optional hard metal output. 10 V, AC are impressed permanently on the hard metal output. This tension cannot be adjusted.

A hard metal output is suitable for marking hardened materials e. g. tools. With the use of the hard metal output better results can be obtained on such materials as with the use of the standard connections.

Types of stencils

Except an ÖSTLING long-term stencil also short-time stencils can be used

In order to make your own short-time stencils for frequently changing texts very fast and flexibly, the following accessories are available:

- Stencil production system ÖSTLING PT (different versions).
- 9-pin printer with Software Stencil Creator.

For further technical support please contact our technicians. They answer gladly your questions about different marking heads and further accessories like e. g. customized devices or installation of the equipment into your production line.

3 Set-up

3.1 Set the input voltage

The preset input voltage (115 V or 230 V) can be set finely for adjustment to other electricity mains. The following input voltages are available:

- 110 V.
- 120 V.
- 220 V.
- 230 V.
- 240 V.

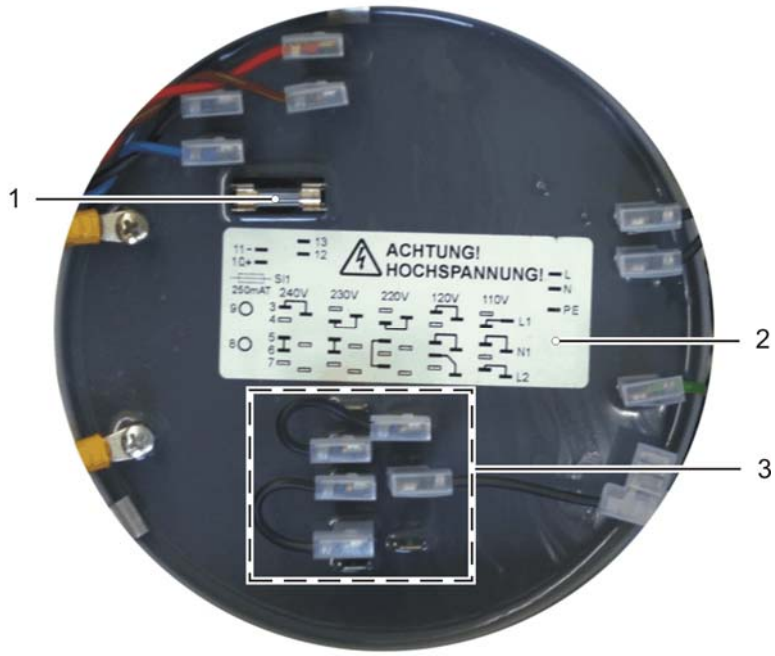
The marking equipment must be opened for fine adjustment of the input voltage!

Danger of electric shock.

➢ Only an electrician is allowed to adjust the input voltage.

➢ Before opening the equipment pull the line cord.

1. Loosen the 3 upper screws on both sides of the equipment.
2. Take off the cover of the equipment.
   Transformer appears:



1	Fuse magnet valve	3	Preset input voltage (here: 230 V)
2	Sticker technical data		

Transformer Fig. 10014

3. Set the desired input voltage with the jumpers as shown on the sticker (2).

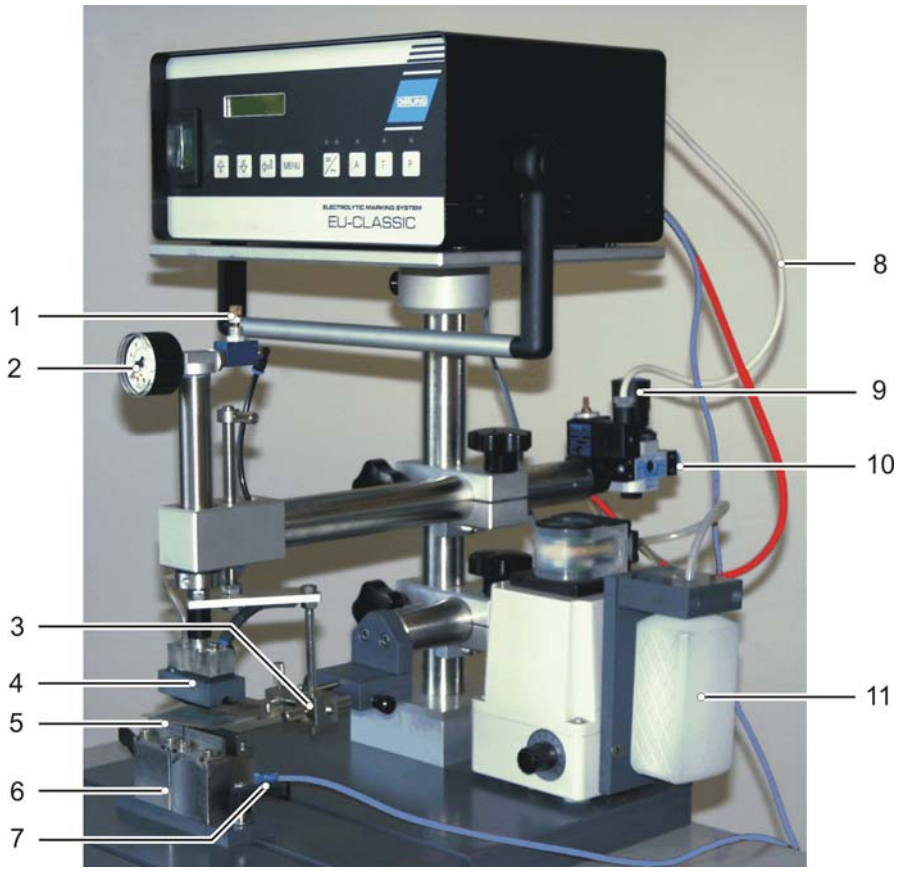
The net frequency (50 or 60 Hz) is automatically detected by the equipment.

Note
The 24V, DC output (output magnet valve) is secured with a second fuse (1) additionally to the magnet valve fuse on the back of the equipment. This fuse prevents the destruction of the internal jumper rectifier with a overcurrent (>1 A), which can be caused e.g. by a short-circuit. The rated current intensity of the fuse stands on the sticker (2).

3.2 Setting up the EMP or MODULMAT

EMP

Note
The connections for the cables on the back of the equipment are equipped with an isolating head. Both cables with plug can be tucked in and cables with suitable lugs can be tightened.



1	Throttle cylinder speed	6	Adjustment block
2	Pressure gauge	7	Connection negative cable
3	Stencil holder X-Y-Z	8	Cable and plug magnet valve
4	Marking head	9	Pressure reducing valve
5	Stencil glued on stencil cover	10	Compressed air connection
		11	Electrolyte storage vessel

Connections EMP — Fig. 10124

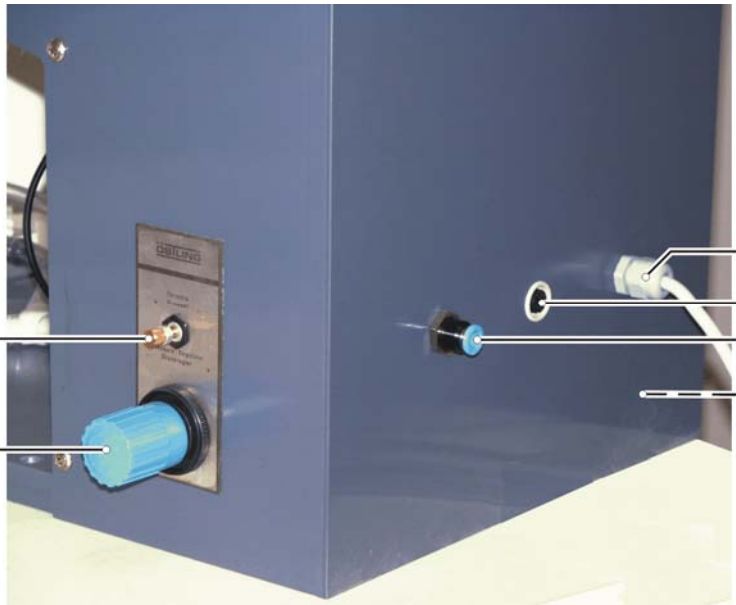
12	Connection foot switch	16	Connection pump
13	Fuse magnet valve	17	Connection positive cable
14	Output magnet valve	18	Connection negative cable
15	Connection line cord	19	Hard metal output (option)

Connections EU CLASSIC / EU EXPERT Fig. 10005

1. Plug in the line cord (15).
2. Tuck the plug of the electrolyte pump into the connection pump (16).
3. Plug in the foot switch (12).
4. Tuck the plug magnet valve (8) into output magnet valve (14).
5. Tuck the plug of the red positive cable into the red connection (17) at the control.
6. Connect the connection negative cable (7) at the adjustment block via blue negative cable with the black connection (18) at the control.
7. To supply the EMP with compressed air: Lead tube PUN 8 from the internal compressed air supply to the compressed air connection (10) of the EMP.

   The pressure must amount to 4.5 to 5 bar. With the pressure reducing valve (9) the pressure can be set finely.
8. Fill electrolyte into the electrolyte storage vessel (11, max. 250 ml).

MODULMAT



1	Throttle for cylinder speed	4	Connection foot switch
2	Pressure reducing valve	5	Compressed air connection
3	Line cord	6	Connection pump (at the side)

Connections MODULMAT Fig. 10123

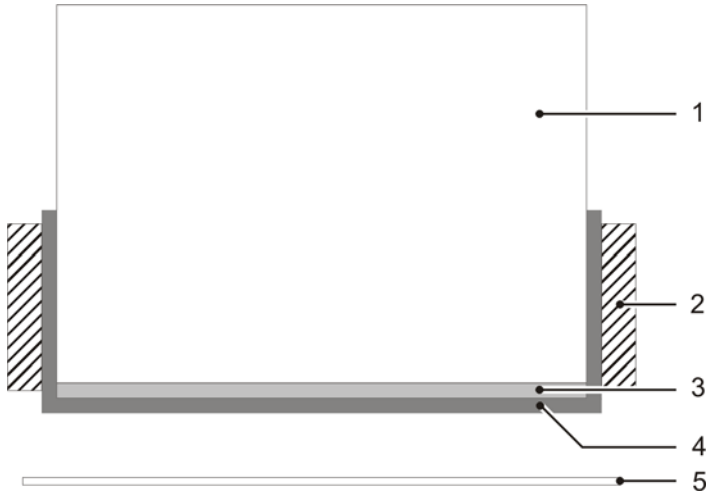
1. Plug in the line cord (3).
2. Tuck the plug of the electrolyte pump into the connection pump (6).
3. Plug in the foot switch (4).
4. To supply the MODULMAT with compressed air: Lead tube PUN 8 from the internal compressed air supply to the compressed air connection (5) of the MODULMAT.

   The pressure must amount to 4.5 to 5 bar. With the pressure reducing valve (2) the pressure can be set finely.
5. Fill electrolyte into the electrolyte storage vessel (max. 250 ml).

3.3 Preparing the marking head

Black/white marking

A black/white marking is possible on most of the metals, see page 35.

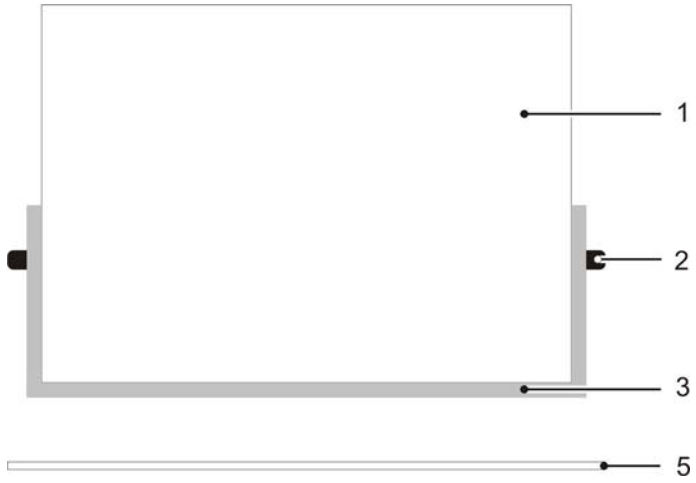


1	Marking head	4	Conductive net
2	Cartridge	5	Stencil glued on stencil cover
3	Black felt		

Marking head for black/white markings — Fig. 10103

1. Tailor black felt (3) to the size of the surface of the marking head (2).
2. Tailor conductive net (4) so that it gets over approx. 15 mm at all sides of the marking head.
3. Place the felt onto the marking head.
4. Lay the conductive net over the felt.
5. Clamp the felt and conductive net with the cartridge (3).
6. Attach the marking head to the EMP/MODULMAT (4, Fig. 10102, page 12).
7. Attach the stencil glued on stencil (5) to the stencil holder (3, Fig. 10102, page 12).

Deep marking A deep marking is possible on many metals, but a general statement cannot be made. see page 35.



1	Marking head	3	Green felt
2	O-ring seal	5	Stencil glued on stencil cover

Marking head for deep markings Fig. 10104

Note
You don't need conductive net for deep marking.

1. Tailor green felt (3) so that it gets over approx. 15 mm at all sides of the marking head (1).
2. Place the felt onto the marking head.
3. Bend the O-ring seal (2) over the felt.
4. Attach the marking head to the EMP/MODULMAT (4, Fig. 10102, page 12).
5. Attach the stencil glued on stencil (5) to the stencil holder (3, Fig. 10102, page 12).

4 Operation

Electrolytes are oxidizing substances!

Danger of poisoning.

- Do not swallow the electrolyte and do not bring it on the mucous membranes or eyes.
- Wash hands before pausing and after work.

Open-end output voltage!

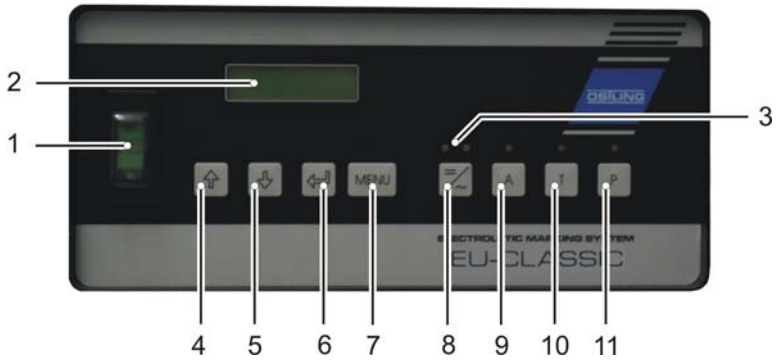
Danger of life for persons with cardiac pacemaker.

- Work with the marking equipment is forbidden for persons with cardiac pacemaker.

Danger of a short-circuit!

High current flow. Safety device is destroyed.

- The marking head may not come into contact with the baseplate.



1	MAIN SWITCH	7	MENU
2	Display	8	Pushbutton AC/DC
3	LEDs AC and DC	9	AUTOMATIC
4	Pushbutton ↑ (increase values)	10	TIMER
5	Pushbutton ↓ (decrease values)	11	PUMP
6	ENTER		

Operating devices EU CLASSIC / EU EXPERT Fig. 10008

4.1 Programming a marking with EU CLASSIC

After switching on the equipment is in the main menu. The last set values and settings remain also after switching off the equipment.

1. Switch on the equipment over MAIN SWITCH (1).

   Main menu appears, in the display (2) appears e. g. "MP=08.0 MT=04.0".

   In the main menu the pushbuttons AUTOMATIC, TIMER and PUMP have a function. A program can be started only in the main menu.
2. Press ENTER (6) to enter the submenu "Marking power".

Setting the marking power

The marking power changes with the impressed voltage. In order to achieve a long service life of the stencils, the marking power should be selected as small as possible. Increase the marking time with unsatisfactory marking results first, before the marking power is increased.

3. To choose alternating or direct current: press =/~ (8).
   - AC (alternating current) for black/white marking.
   - DC (direct current) for deep marking.

   LED (3) above the pushbutton shows the selected current type.
4. To increase the marking power: press ↑ (4).

   Each press increases the marking power in steps of 0.2 units. The maximum value is 24.0.
5. To decrease the marking power: press ↓ (5).

   Each press decreases the marking power in steps of 0.2 units. The minimum value is 0.2.
6. To reject the settings: press MENU (7).

   Main menu appears.
7. To assume the settings: press ENTER (6).

   Submenu "Time MT" appears.

Setting the marking time

During the marking time voltage is impresses and current flows. With very long marking time the electrolyte heats itself, the stencil becomes hot. The service life of the stencil is reduced.

8. To increase the marking time MT: press ↑ (4).

   Each press increases the marking time in steps of 0.1 s. The maximum value is 15.0 s.
9. To decrease the marking time MT: press ↓ (5).

   Each press decreases the marking time in steps of 0.1 s. The minimum value is 0.1 s.
10. To reject the settings: press MENU (7).

    Main menu appears.
11. To assume the settings: press ENTER (6).

    If the options "Pumping time" and/or "Retarder" are activated, the submenu "Time PT" or "Time RT" appears. Otherwise the main menu appears.

Setting the pumping time

During the pumping time the electrolyte pump runs. The pumping time begins at the same time as the marking time.

12. To increase the pumping time PT: press ↑ (4).
    Each press increases the pumping time in steps of 0.1 s. The maximum value is 10.0 s.
13. To decrease the pumping time PT: press ↓ (5).
    Each press decreases the pumping time in steps of 0.1 s. The minimum value is 0.1 s.
14. To reject the settings: press MENU (7).
    Main menu appears.
15. To assume the settings: press ENTER (6).
    If the option "Retarder" is activated, the submenu "Time RT" appears. Otherwise the main menu appears.

Setting the retarding time

During the retarding time no voltage is impressed, the marking is "retarded". The retarding time begins when the foot switch is pressed.

16. To increase the retarding time RT: press ↑ (4).
    Each press increases the retarding time in steps of 0.1 s. The maximum value is 10.0 s.
17. To decrease the retarding time: press ↓ (5).
    Each press decreases the retarding time in steps of 0.1 s. The minimum value is 0.1 s.
18. To reject the settings: press MENU (7).
    Main menu appears.
19. To assume the settings: press ENTER (6).
    If the option "Marking counter" is activated, the submenu "Marking counter" appears. Otherwise the main menu appears.

Marking counter

The marking counter counts each marking performed.

20. Press ↓ (5), to set the counter on zero.
21. To reject the setting on zero: press MENU (7).
    Main menu appears.
22. To confirm the setting on zero: press ENTER (6).
    Main menu appears.

Note
If the equipment is equipped with a hard metal output, a second red connection (19, Fig. 10009, page 11) is on the backside. 10 V, AC are impressed permanently on the hard metal output. This voltage cannot be adjusted. When connecting the red positive cable to the hard metal output the pushbuttons AUTOMATIC (9) and TIMER (10) are not active.

Default settings

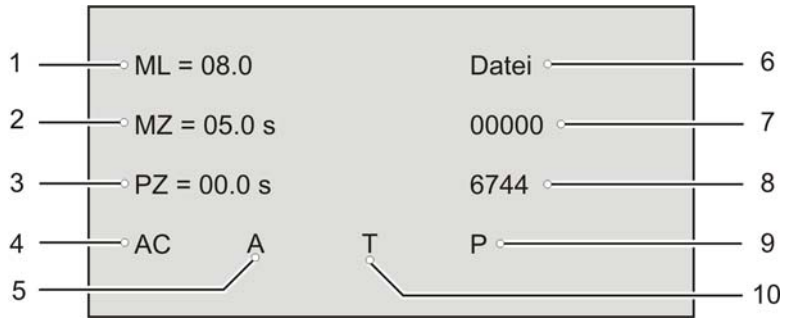
By pressing MENU when switching on the equipment all settings are put back to default setting:

Marking power	MP		8.0
Marking time	MT	[s]	2.0
Pumping time	PT	[s]	off; 0.0
Retarding time	RT	[s]	off; 0.01
Current type			LED AC = on LED DC = off
TIMER			LED T = off
AUTOMATIC (Output magnet valve)			LED A = off
PUMP (Connection pump)			LED P = off
Marking counter			00000
Language			German

Tab. 4

4.2 Programming a marking with EU EXPERT

After switching on the equipment is in the main menu. The last set values and settings remain also after switching off the equipment. The display shows e. g.:



1 Marking power MP
2 Marking time MT in [s]
3 Pumping time PT in [s]
4 Current type:
AC = alternating current,
DC = direct current
5 AUTOMATIC
6 Name of the file (max. 6 digits)
7 Marking counter (max. 99999)
8 Electrolyte designation (max. 5 digits)
9 TIMER
10 PUMP

Indication on display in main menu Fig. 10016

Pushbutton	Indication on display	LED	Function
AUTOMATIC	no A	off	Output magnet valve is not available and not activated.
	inverted A	on	Output magnet valve is available but not activated.
	A	on	Output magnet valve available and activated.
TIMER	no T	off	Permanent function.
	T	on	Function timer, voltage is impressed when the foot switch is pressed.
PUMP	no P	off	Pump not activated.
	P	on	Pump activated.

Meaning of the pushbuttons A, T and P Tab. 5

In the main menu the pushbuttons AUTOMATIC, TIMER and PUMP have a function. A program can be started only in the main menu.

1. Press MENU (7, Fig. 10008, page 21) to enter the menu selection.

   The following menus can be selected:
   - Adjustment.
   - Marking options.
   - Files.
   - Language.
   - Service.

2. Press ↑ (4) or ↓ (5) until the desired menu is selected.
3. Press ENTER (6) to enter the desired menu.

A small arrow ⇒ indicates the menu or the parameter that can be changed.

Set the adjustments

The following parameters can be changed in the menu "Adjustment":

- Marking power.
- Marking time.
- Pumping time.
- Retarder.
- Electrolyte.
- Delete counter.

Setting the marking power

The marking power changes with the impressed voltage. In order to achieve a long service life of the stencils, the marking power should be selected as small as possible. Increase the marking time with unsatisfactory marking results first, before the marking power is increased.

1. Press ↓ (5) in menu "Adjustment" until parameter "Mark power" appears.
2. Press ENTER (6).
   Arrows points at "MP = ...".
3. To choose alternating or direct current: press =/~ (8).
   - AC (alternating current) for black/white marking.
   - DC (direct current) for deep marking.

   LED (3) above the pushbutton shows the selected current type.
4. To increase the marking power: press ↑ (4).
   Each press increases the marking power in steps of 0.2 units. The maximum value is 24.0.
5. To decrease the marking power: press ↓ (5).
   Each press decreases the marking power in steps of 0.2 units. The minimum value is 0.2.
6. To reject the settings: press MENU (7). To assume the settings: press ENTER (6).
   Menu "Adjustment" appears.

Setting the marking time

During the marking time voltage is impresses and current flows. With very long marking time the electrolyte heats itself, the stencil becomes hot. The service life of the stencil is reduced.

7. Press ↓ (5) until parameter "Mark time" appears.
8. Press ENTER (6).
   Arrow points at "MT = ...".
9. To increase the marking time MT: press ↑ (4).
   Each press increases the marking time in steps of 0.1 s. The maximum value is 15.0 s.
10. To decrease the marking time MT: press ↓ (5).
    Each press decreases the marking time in steps of 0.1 s. The minimum value is 0.1 s.
11. To reject the settings: press MENU (7). To assume the settings: press ENTER (6).
    Menu "Adjustment" appears.

Setting the pumping time

During the pumping time the electrolyte pump runs. The pumping time begins at the same time as the marking time.

12. Press ↓ (5) until parameter "Pump time" appears.
13. Press ENTER (6).
    Arrow points at "PT = ...".
14. To increase the pumping time PT: press ↑ (4).
    Each press increases the pumping time in steps of 0.1 s. The maximum value is 10.0 s.
15. To decrease the pumping time PT: press ↓ (5).
    Each press decreases the pumping time in steps of 0.1 s. The minimum value is 0.1 s.
16. To reject the settings: press MENU (7). To assume the settings: press ENTER (6).
    Menu "Adjustment" appears.

Setting the retarding time

During the retarding time no voltage is impressed, the marking is "retarded". The retarding time begins when the foot switch is pressed.

17. Press ↓ (5) until parameter "Retarder" appears.
18. Press ENTER (6).
    Arrow points at "RT = ...".
19. To increase the retarding time RT: press ↑ (4).
    Each press increases the retarding time in steps of 0.1 s. The maximum value is 10.0 s.
20. To decrease the retarding time: press ↓ (5).
    Each press decreases the retarding time in steps of 0.1 s. The minimum value is 0.1 s.
21. To reject the settings: press MENU (7). To assume the settings: press ENTER (6).
    Menu "Adjustment" appears.

Enter the electrolyte

Entering an electrolyte designation makes sense when all adjustments are saved in a file (see page 31).

22. Press ↓ (5) until parameter "Electrolyte" appears.
23. Press ENTER (6).
    Arrow points at the electrolyte designation or at an empty row under "Electrolyte".
24. Leaf through number 0 - 9 and letters A - Z and a - z with ↑ (4) und ↓ (5). Press ENTER (6) to select a number or letter.
    The cursor jumps one digit to the right.
25. Repeat step 24 until the electrolyte designation is entered (max. 5 digits).

Note
If the electrolyte designation is shorter than 5 digits, the last digits must be filled up with blanks. The blank is above the zero (reachable with ↑).

26. To reject the enter: press MENU (7). To assume the enter: press ENTER (6).
    Menu "Adjustment" appears.

Reset the marking counter

The marking counter counts each marking performed.

27. Press ↓ (5) until parameter "Delete counter" appears.
28. Press ENTER (6).
    Arrow points at "Counter = ...".
29. Press ↓ (5) to set the counter on zero.
30. To reject the setting on zero: press MENU (7). To confirm the setting on zero: press ENTER (6).
    Menu "Adjustment" appears.

31. Press MENU (7).
    Menu selection appears.

Note
If the equipment is equipped with a hard metal output, a second red connection (19, Fig. 10009, page 11) is on the backside. 10 V, AC are impressed permanently on the hard metal output. This voltage cannot be adjusted. When connecting the red positive cable to the hard metal output the pushbuttons AUTOMATIC (9) and TIMER (10) are not active.

Set the marking options for pulse marking

In the menu "Mark options" parameters for a pulse marking are set.

Generally the marking power should be selected as small as possible so that the template does not overheat. Increase the marking time with unsatisfactory marking results first, before the marking power is increased. However with very long marking time the stencil also heats up.

During a pulse marking the current is briefly switched off during a marking, so that the stencil does not overheat. In addition it is possible to shift between alternating (AC) and direct current (DC) during the pulse marking. This is used particularly with deep markings.

The following parameters can be changed in the menu "Mark options":

- Pulse marking.
- On periode.
- Off periode.
- DC/AC automatic.
- DC/AC time.
- DC/AC marking power.

Pulse marking

Pulse marking must be ON so that the two parameters "On periode" and "Off periode" are considered during a marking.

1. Press ↓ (5) in menu "Mark options" until parameter "Pulse marking" appears.
2. Press ENTER (6).
3. Press ↓ (5) until pulse marking is ON or OFF.
4. To reject the settings: press MENU (7). To assume the settings: press ENTER (6).

   Menu "Mark options" appears.

Setting the on periode

During a pulse marking the entire marking time divides itself into sections of on periodes and off periodes. During the on periode voltage is impresses and current flows.

5. Press ↓ (5) until parameter "On periode" appears.
6. Press ENTER (6).
7. To increase the on periode: press ↑ (4).

   Each press increases the time of the on periode in steps of 0.1 s. The maximum value is 5.0 s.
8. To decrease the on periode: press ↓ (5).

   Each press decreases the time of the on periode in steps of 0.1 s. The minimal value is 0.1 s.
9. To reject the settings: press MENU (7). To assume the settings: press ENTER (6).

   Menu "Mark options" appears.

Setting the off periode

During the off periode no current flows. The stencil does not continue to heat itself.

10. Press ↓ (5) until parameter "Off periode" appears.
11. Press ENTER (6).
12. To increase the off periode: press ↑ (4).

    Each press increases the time of the off periode in steps of 0.1 s. The maximum value is 5.0 s.
13. To decrease the off periode: press ↓ (5).

    Each press decreaes the time of the off periode in steps of 0.1 s. The minimum value is 0.1 s.
14. To reject the settings: press MENU (7). To assume the settings: press ENTER (6).

    Menu "Mark options" appears.

DC/AC automatic

If you want to shift during a pulse marking between alternating (AC) and direct current (DC) DC/AC automatic must be ON. Only in this case the parameters "=/~ time" and "=/~ mark power" are considered during the marking.
The marking starts with the current type that is selected with the pushbutton AC/DC (8) (see page 26).

15. Press ↓ (5) until parameter "=/~ automatic" appears.
16. Press ENTER (6).
17. Press ↓ (5) until DC/AC automatic is ON or OFF.
18. To reject the setting: press MENU (7). To assume the setting: press ENTER (6).

    Menu "Mark options" appears.

Setting the DC/AC time

Pulse marking with direct (DC) and alternating current (AC): Time after that the type of current is changed.

19. Press ↓ (5) until parameter "=/~ time" appears.
20. Press ENTER (6).
21. To increase the DC/AC time: press ↑ (4).

    Each press increases the DC/AC time in steps of 0.1 s. The maximum value is 15.0 s.
22. To decrease the DC/AC time: press ↓ (5).

    Each press decreases the DC/AC time in steps of 0.1 s. The minimum value is 0.1 s.
23. To reject the settings: press MENU (7). To assume the settings: press ENTER (6).

    Menu "Mark options" appears.

DC/AC marking power

Marking power during a pulse marking with direct (DC) and alternating current (AC) that is impressed before shifting to the other current type. After shifting the marking power is impressed that is set in the menu "Adjustment" (see page 26).

24. Press ↓ (5) until parameter "=/~ mark power" appears.
25. Press ENTER (6).
26. To increase the DC/AC marking power: press ↑ (4).

    Each press increases the marking power in steps of 0.2 units. The maximum value is 24.0.
27. To decrease the DC/AC marking power: press ↓ (5).

    Each press decreases the marking power in steps of 0.2 units. The minimum value is 2.0.
28. To reject the settings: press MENU (7). To assume the settings: press ENTER (6).

    Menu "Mark options" appears.

29. Press MENU (7).

    Menu selection appears.

Working with files

For always recurring products all parameters which are entered in the menu "attitudes" can be stored in the menu "files". If required, the stored files (max. 15) can be loaded and processed in the main menu. No more necessary files can be deleted.

1. To save a file press ↓ (5) in menu "Files" until "Save file" appears.
2. Press ENTER (6).

   Arrow points at "No. ...". The file " No. 00 Werk" cannot be changed.
3. Press ↑ (4) until a file number without name appears.
4. Press ENTER (6).
5. Leaf through number 0 - 9 and letters A - Z and a - z with ↑ (4) und ↓ (5). Press ENTER (6) to select a number or letter.

   The cursor jumps one digit to the right.
6. Repeat step 5 until the file name is entered (max. 6 digits).

   Note
   If the file name is shorter than 6 digits, the last digits must be filled up with blanks. The blank is above the zero (reachable with ↑).

7. Press ENTER (6).

   All parameters entered in the menu "Adjustment" are saved. Menu "Files" appears.

8. To load the data of a saved file: press ↓ (5) in menu "Files" until "Load file" appears.
9. Press ENTER (6).
   Arrow points at "No. ...".
10. Press ↑ (4) until desired file appears.
11. Press ENTER (6).
    All data of the file are loaded, the marking can be done.

12. To delete a file press ↓ (5) in menu "Files" until "Delete file" appears.
13. Press ENTER (6).
    Arrow points at "No. ...".
14. Press ↑ (4) until desired file appears.
15. Press ENTER (6).
    File is deleted.

Set the language

The following languages can be set:

- German
- English
- French

1. Press ENTER (6) in menu "Language".
2. Press ↑ (4) or ↓ (5) until the desired language is selected.
3. To reject the changing of the language: press MENU (7). To change the language: press ENTER (6)
4. Press MENU (7).
   Menu selection appears. All text in the display appears in the set language.

Query of service data

In the menu "Service" important data for service technicians can be queried:

- Operating hours: shows how long MAIN SWITCH was ON.
- Item counter: shows how many markings are done overall.
- Net frequency: shows the active net frequency.

The information in the menu "Service" can be queried but not changed.

1. Open menu "Service".
   The operating hours of the equipment are displayed.
2. Press ↓ (5).
   The total number of markings is displayed.
3. Press ↓ (5).
   The active net frequency is displayed.
4. Press MENU (7).
   Menu selection appears.

Default settings

By pressing MENU when switching on the equipment all settings are put back to default setting:

Marking power	MP		8.0
Marking time	MT	[s]	2.0
Pumping time	PT	[s]	off; 0.0
Retarding time	RT	[s]	off; 0.01
Pulse marking			off
On periode		[s]	2.0
Off periode		[s]	2.0
DC/AC automatic			off
DC/AC time		[s]	2.0
DC/AC marking power			8.0
Current type			LED AC = on LED DC = off
TIMER			LED T = off
AUTOMATIC (Output magnet valve)			LED A = off
PUMP (Connection pump)			LED P = off
File			Werk
Marking counter			00000
Language			German

Tab. 6

4.3 Marking a product

1. Switch on the equipment over the MAIN SWITCH (1, Fig. 10008, page 21).
2. Program the marking (see paragraph 4.1 or 4.2).
3. Start the compressed air supply.
4. Press AUTOMATIC (9).
5. Press TIMER (10).

   Voltage drops to 0 V and is only impressed for the programmed marking time MT.
6. Place the product to be marked onto the adjustment block.
7. Press the foot switch.

   Marking head drives downward and presses the stencil on the product during the programmed marking time MT. At the same time electrolyte is pumped to the marking head according to the programmed pumping time PT.

   Note
   If the marking head does not drive downward briskly and evenly: Set speed with throttle for cylinder speed (1, Fig. 10102, page 12 or Fig. 10123, page 13).
8. Remove electrolyte remainders from the product.
9. Rinse marking head and stencil under clear water after marking.

Note
If the marking picture worsens, examine felt and conductive net. Since a operatingconditioned carbonization of felt takes place, the felt must be changed occasionally.

4.4 Choice of electrolytes

With the electrolytes specified here you find a selection of the usually-used electrolytes. Electrolytes for special materials can be supplied after attempt markings in most cases.

Number of electrolyte	Type of marking		For marking of...
	black/ white	deep	
33	x		hard chrome plated metals
332	x		carbides
67/6	x		tool steels ball bearings
67/10/3	x		all corrosion-susceptibly, ordinary steels
6744	x		chrome steels and other stainless steels
639	x		aluminum die casting zinc plated materials
71	x		chemically nickel plated materials high-alloyed tool steels
72	x		chrome steels (18/8, VA)
74	x		saw blades
75	x		chrome plated materials
98	x		titan
117	x		black oxidized (bronzed) materials
119	x		steam-finished materials
DE 20		x	steels
DE 40		x	non-ferrous metals
DE 90		x	steels with light underground

Tab. 7

Note

The electrolytes DE 20, DE 40 and DE 90 are electrolytes for deep marking and must be processed with direct current (DC).

The electrolytes 67/6, 67/10/3 and 74 are noncorrosive and do not have to get neutralized.

For the neutralization of ferrous metals the neutralyte N8 is suitable, for non-ferrous metals the neutralyte N2 is suitable.

Clean noncorrosive materials after marking with warm water. Treat corrosion-susceptible materials with ÖSTLING corrosion protection.

4.5 Trouble shooting

Problem: No mark at all

Check the following points:

- Is the line cord plugged in?
- Are all the other cables plugged in correctly?
- Has been set a voltage?
- Is the fuse on the backside of the control in order?
- Is the marking head moistened with electrolyte?
- Does a current flow between marking head and negative contact pin?

Note
Only electrically leading surface can be marked!

Painted, anodised or otherwise coated surfaces are not suitable for marking by electrolytic marking systems.

Problem: Mark is not clear

Check the following points:

- Is the stencil clean?
- Wash the stencil and the complete marking head with water to remove the oxides.
- Is the surface of the product clean? Wipe off dirt and excess oil with a dry cloth before marking.

Problem: Black spots around the mark

The stencil was treated inappropriately. It was broken and became permeable or was torn in another way. In order to solve the problem, the stencil must be replaced.

In emergency holes in the stencil can be sealed with tape or ÖSTLING stencil tape until another stencil is available.

Problem: Magnet valve does not operate

Check the following points:

- Is the magnet valve fuse (13, Fig. 10009, page 11) on the backside of the control in order?
- Is the magnet valve fuse (1, Fig. 10014, page 15) on the transformer in order? To check this, the equipment must be opened.

Second fuse magnet valve is in the equipment. The equipment must be opened!

Danger of electric shock.

- ➢ Check and change of the fuse must be done by an electrician.
- ➢ Before opening the equipment pull the line cord.

5 Maintenance

Regular maintenance of the control is not necessary. With the occurrence of a disturbance please contact our service department.

Note
Opening of the control without authorisation voids the warranty.

ÖSTLING - worldwide

ÖSTLING
Markiersysteme GmbH
Broßhauser Str. 27
D-42697 Solingen
Tel.: +49 - 212 - 26 96 0
Fax.: +49 - 212 - 26 96 199
Internet: http://www.ostling.com
E-mail: info@ostling.com

Switzerland

ÖSTLING
Markiersysteme AG
Eichenweg 16
CH-4900 Langenthal
Tel.: +41 - 62 - 922 80 20
Fax.: +41 - 62 - 922 66 17

France

ÖSTLING
Système de Marquage
Technopôle Metz 2000
9 rue Claude Chappe
F-57070 Metz
Tel.: +33 - 387 - 768 339
Fax.: +33 - 387 - 768 329

Sweden

ÖSTLING
Märksystem AB
Prästkragens väg 40
S-13245 Saltsjö-Boo
Tel.: +46 - 8 - 514 90 510
Fax.: +46 - 8 - 514 90 529

USA

ÖSTLING
Marking Sytems, Inc.
931 East Water Street
USA - Chillicothe, 45601 Ohio
Tel.: +1 - 740 - 779 99 18
Fax.: +1 - 740 - 779 99 10