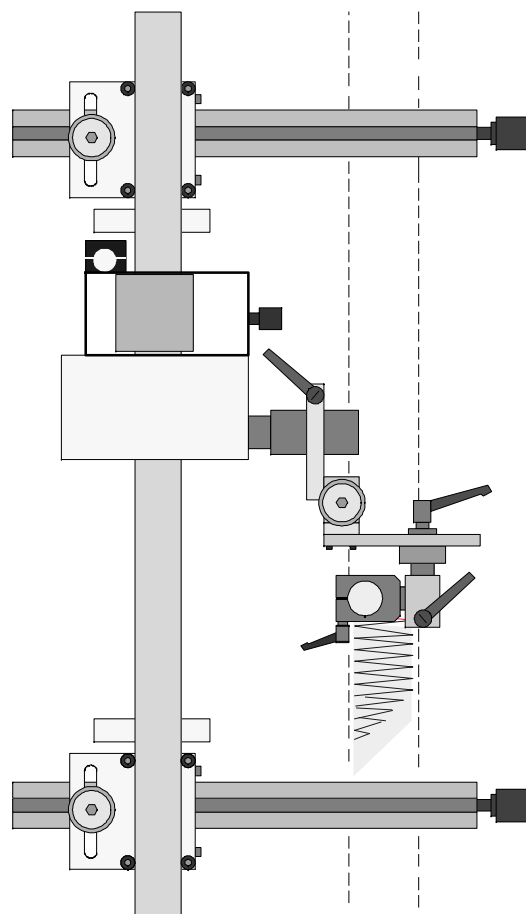


Railtrac

BV1000/BVR1000



Instruction manual

ENGLISH 3

Rights reserved to alter specifications without notice.

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1 DIRECTIVE

DECLARATION OF CONFORMITY

ESAB AB, Welding Equipment, SE-695 81 Laxå, Sweden, gives its unreserved guarantee that automatic welding machine **Railtrac BV1000/BVR1000** from serial number **948** (1999 w.48) complies with standard EN 12100-2 and EN 60204-1, in accordance with the requirements of directive (98/37/EEC) and with standard EN 61000-6-2 and also EN 61000-6-3, in accordance with the requirements of directive (2004/108/EEC).

Laxå 2007-05-23



Kent Eimbrodt
Global Director
Equipment and Automation

2 SAFETY

Users of ESAB automatic welding machines have ultimate responsibility for ensuring that anyone who works on or near the equipment observes all the relevant safety precautions.

The following recommendations should be observed in addition to the standard regulations that apply to the work place.

All work must be carried out according to the specified instructions by personnel who are thoroughly familiar with the operation of the welding machine.

Incorrect or unintentional operation of the equipment may lead to a hazardous situation which can result in injury to the operator and damage to the equipment.

1. Anyone who uses the automatic welding machine must be familiar with:
 - its operation
 - the location of emergency stops
 - its function
 - relevant safety precautionsTo make this easier each switch, pushbutton or potentiometer is marked with a symbol or text that indicates its function when activated.
2. The operator must ensure that:
 - no unauthorized person is stationed within the working area of the machine when it is started up.
 - that no-one is in a hazardous position when the carriage or slide mechanisms are operated.
3. The work place must:
 - be clear of mechanical components, tools, or other obstructions that could prevent the operator from moving freely within the working area.
 - be organized so that there is free access to the emergency stop.
4. Personal safety equipment
 - Always wear recommended personal safety equipment, such as safety glasses, flame-proof clothing, safety gloves.
 - Do not wear loose-fitting items, such as scarves, bracelets, etc., which could become trapped.
5. General precautions
 - Live electrical components are normally shielded from accidental contact.
 - Make sure the return cable is connected securely.
 - Work on high voltage components may **only be carried out by a qualified electrician**.
 - Appropriate fire extinguishing equipment must be clearly marked and close at hand.
 - Lubrication and maintenance must not be carried out on the equipment during its operation.



WARNING



ARC WELDING AND CUTTING CAN BE INJURIOUS TO YOURSELF AND OTHERS. TAKE PRECAUTIONS WHEN WELDING. ASK FOR YOUR EMPLOYER'S SAFETY PRACTICES WHICH SHOULD BE BASED ON MANUFACTURERS' HAZARD DATA.

ELECTRIC SHOCK - Can kill

- Install and earth the welding unit in accordance with applicable standards.
- Do not touch live electrical parts or electrodes with bare skin, wet gloves or wet clothing.
- Insulate yourself from earth and the workpiece.
- Ensure your working stance is safe.

FUMES AND GASES - Can be dangerous to health

- Keep your head out of the fumes.
- Use ventilation, extraction at the arc, or both, to keep fumes and gases from your breathing zone and the general area.

ARC RAYS - Can injure eyes and burn skin.

- Protect your eyes and body. Use the correct welding screen and filter lens and wear protective clothing.
- Protect bystanders with suitable screens or curtains.

FIRE HAZARD

- Sparks (spatter) can cause fire. Make sure therefore that there are no inflammable materials nearby.

NOISE - Excessive noise can damage hearing

- Protect your ears. Use ear defenders or other hearing protection.
- Warn bystanders of the risk.

MALFUNCTION - Call for expert assistance in the event of malfunction.

READ AND UNDERSTAND THE INSTRUCTION MANUAL BEFORE INSTALLING OR OPERATING.

PROTECT YOURSELF AND OTHERS!

Note:

All warranty undertakings given by the supplier cease to apply if the customer attempts to rectify any faults on the machine during the warranty period.

3 INTRODUCTION

3.1 General

Railtrac BV1000 (with weaving unit) and Railtrac BVR1000 (with weaving unit and adjustable start, stop and return facilities) are two machines designed for repair welding and cladding of rail sections. The welding can be performed by way of weaving across the rail, longitudinal welding or frame welding.

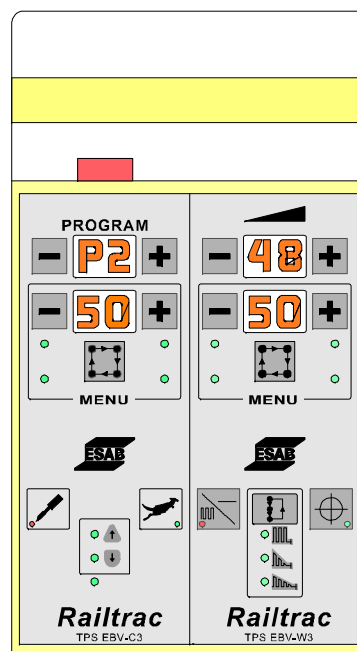
Each machine consists of two rail brackets, travel track, carriage, attachment for the welding torch, control box and remote control unit. As the rail does not contain any racks the risk of service interruption due to spatter from the weld is minimised.

An electrically programmable weaving unit is fitted on the carriage. The weaving unit is synchronised with the motions of the carriage, which makes it possible successively to increase or decrease the width of the weaving maintaining a consistent thickness of the weld layer. By that the layer can be given a start/stop distance of angular shape.

The weaving motion starts from a laterally adjustable 0-line which is set either on the inside or on the outside of the rail. The 0-line can be displaced laterally by +12.5 mm in steps of 0.25 mm.

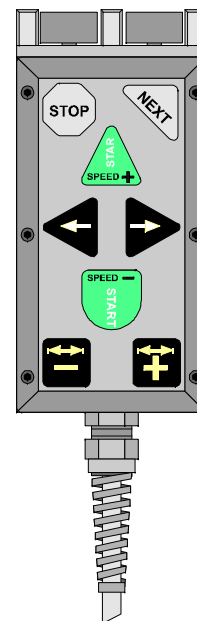
The width of the weaving is programmed in steps of 1 mm. The triangular start distance is to be programmed by way of two parameters only – length and width.

The carriage is controlled by way of a programmable control box. Four different programs can be stored in the control box for the BV version and six ones for the BVR.



By way of the remote control unit the operator can start and stop the carriage (with or without welding), set the travel direction and the travel length, start the weaving and select increasing/decreasing welding width for the start and stop distances.

It is also possible to adjust the width of the weaving and the 0-line in the course of welding.



3.2 Technical Data

Carriage

| | |
|------------------------------------|----------------------------|
| Supply voltage | 36 - 46 VAC / 40 - 60 VDC |
| Power, max. | 80 Watt |
| Weight without rail | 8 kg |
| Weight of rail | 4 kg |
| Dimensions, l x w x h | 170 x 300 x 160 mm |
| Dimensions, rail | 2000 x 40 x 40 mm |
| Welding speed | 10 - 150 cm/min |
| Rapid transport | 150 cm/min |
| Weaving speed | 7 -50 mm/s |
| Weaving width | 1 - 80 mm |
| Length of start and stop distances | 6 - 99 cm |
| 0-line displacement | 25 mm (+ 12.5 mm) |
| Program | 4 (BV1000) och 6 (BVR1000) |
| Slide for height adjustment | 30 mm (+ 15 mm) |

4 INSTALLATION

4.1 General

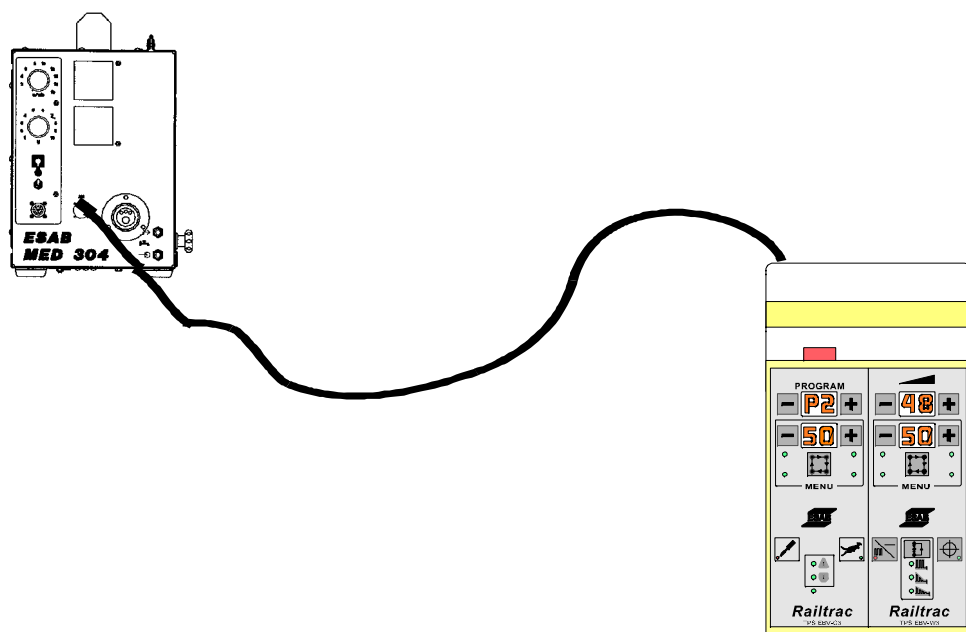
The installation shall be executed by a professional.

4.2 Connections

Wire feed unit MED304/MEH44

Adaptation set 0443 341 880

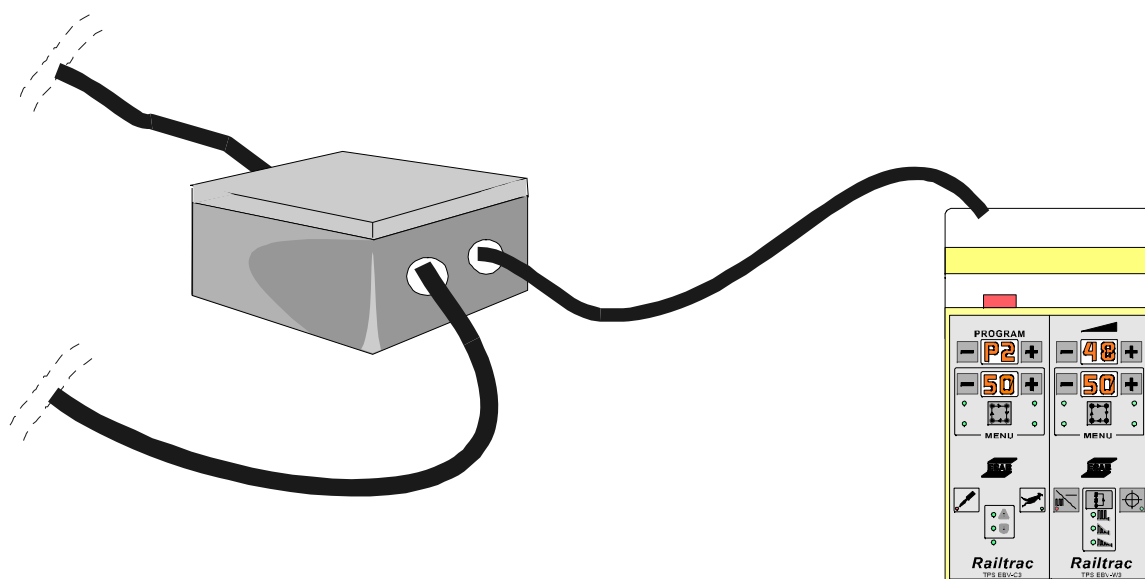
Control cable 5m 0457 360 883



Universal

230 V Transformer 0457 467 880

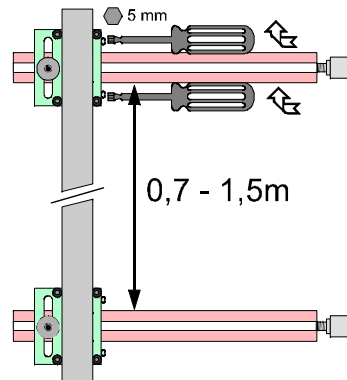
Control cable 5m 0457 360 881



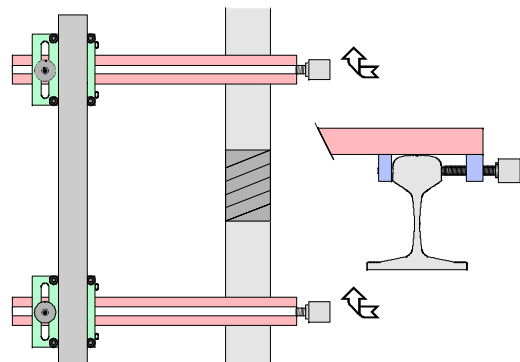
4.3 Assembly

For the assembly of the rail brackets, the carriage, the welding torch attachment and for the connection of the control box, please follow the instructions below.

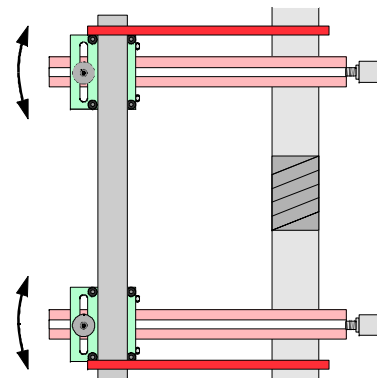
- Mount the rail brackets on the aluminium rail.



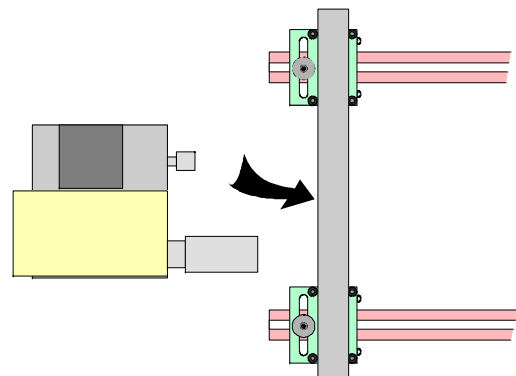
- Fit the brackets across the rail and secure.



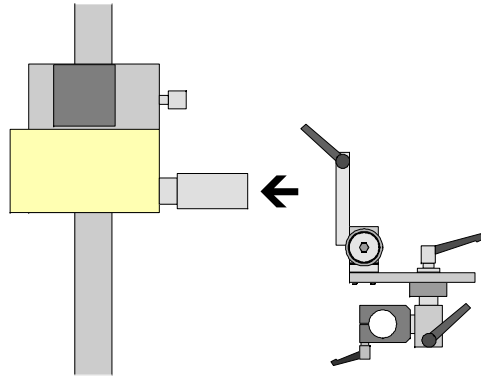
- Adjust the aluminium rail by way of the gauges.



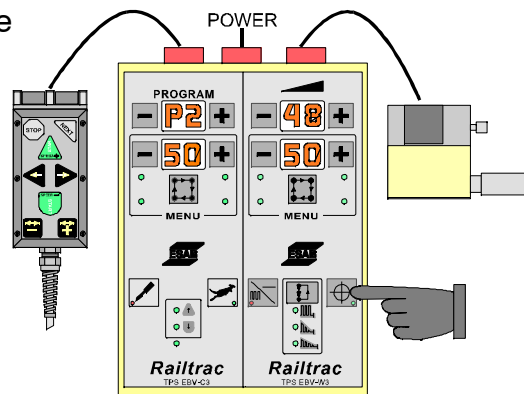
- Mount the carriage on the rail.



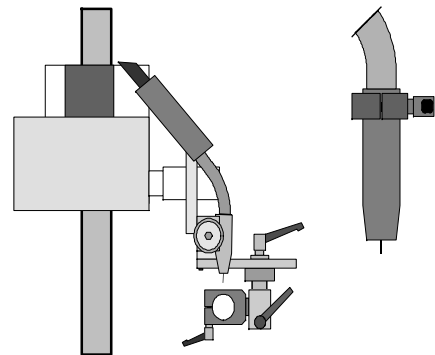
- Tighten the lock screw.
Fit the attachment of the torch.



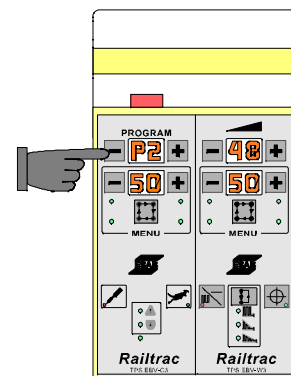
- Connect the remote control unit, the carriage and the voltage supply cable to the control box.
- Press the 0-line button for automatic positioning.



- Fit the welding torch.



- Select a program.
Start welding.

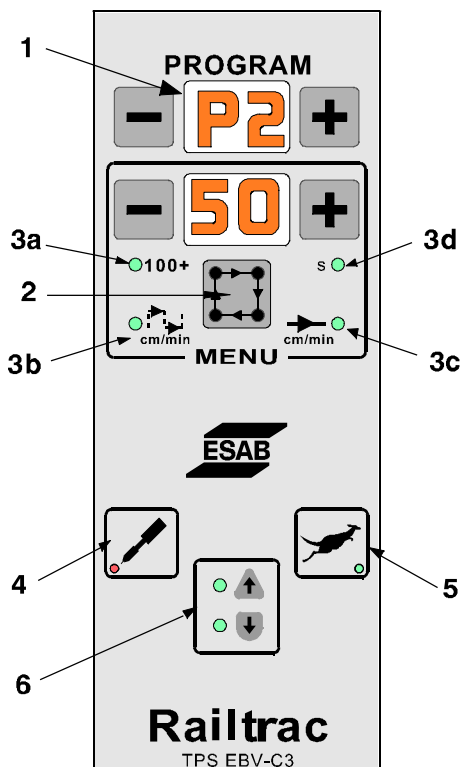


5 OPERATION

5.1 General

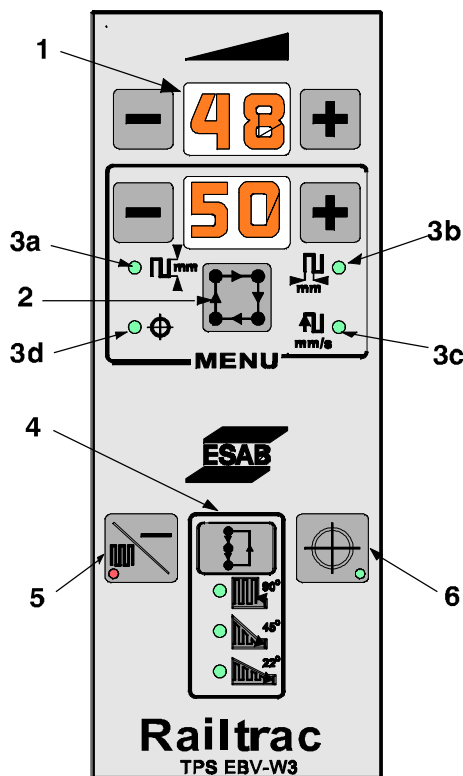
General safety regulations for the handling of the equipment appear from page 4. Read through before you start using the equipment!

5.2 Frontpanel-Travelcarriage



| | | |
|----|---------------------------|--|
| 1. | Program selection: | BV contains four different programs (P1-P4) and BVR six ones (P1-P6). |
| 2. | Menu selector: | For the programming of basic values (to be done by a service technician). |
| 3a | 100+ | Indicates when the value on the display exceeds 100. |
| 3b | Welding speed: | Indicates the speed of the carriage during weaving. |
| 3c | Welding speed: | Indicates the speed of the carriage during longitudinal welding. |
| 3d | Timer: | Indicates when the display shows a timer value (basic value). |
| 4. | Welding OFF/ON: | Red lamp => Welding ON, (activated from the remote control unit). |
| 5. | Rapid transport: | Green lamp is lighting during rapid transport (activated from the remote control unit) |
| 6. | Travel direction: | Green lamp indicates the travel direction of the carriage (activated from the remote control unit) |

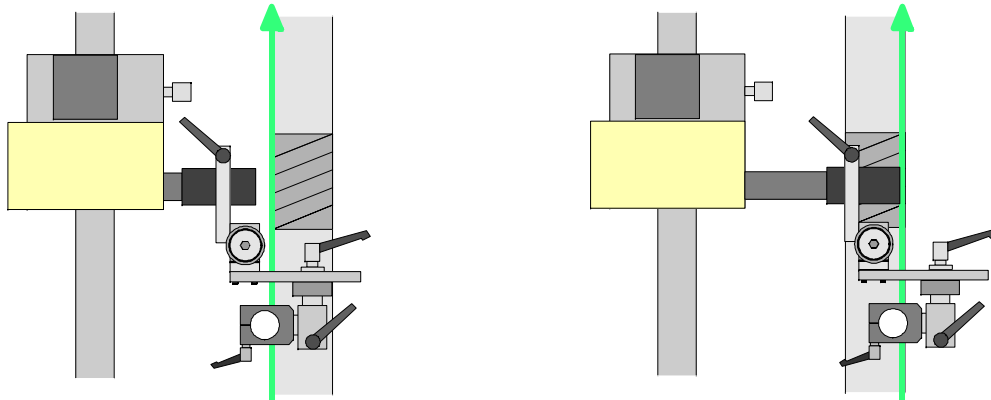
5.3 Front Panel - Weaving Unit



| | | |
|----|----------------------------|--|
| 1. | Length: | The desired length of the start section in cm (program 3). |
| 2. | Menu selector: | Programming of basic values (to be done by a service technician). |
| 3a | Weaving width: | The desired weaving width in mm (P1-P3); in P4, the distance between the longitudinal joints. |
| 3b | Weaving distance: | Programming of the distance between each weaving (basic value). |
| 3c | Weaving speed: | Programming of the weaving speed (basic value). |
| 3d | 0-line pos: | Indicates the 0-line position of the weaving unit. Can be adjusted by 25 mm via the remote control (01-98), 50 marking the middle. |
| 4. | Termination: | Selection of angle: 90°, 45° or 22° (P1-P3). |
| 5. | Weaving unit OFF/ON | Red lamp => ON. |
| 6. | 0-line position: | Adjusts the 0-line position automatically. |

5.4 0-line Adjustment

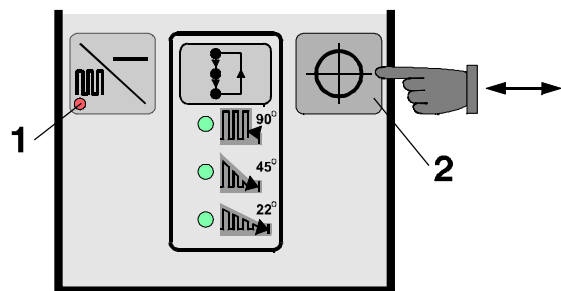
- The 0-line can start either from the inner or from the outer side of the rail.



- The 0-line must be adjusted each time the voltage is switched on (green LED in button (2) flashes).

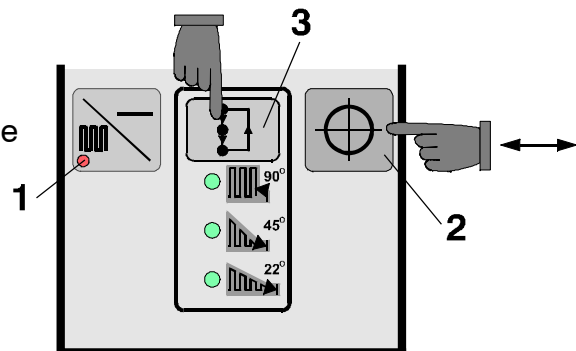
Inner 0-line

- The red lamp (1) must be off.
- Press the 0-line button (2) once.



Outer 0-line

- The red lamp (1) must be off.
- Hold down NEXT (3) and press the 0-line button (2) once.



- When changing programs, for example from P4 to P6 (BVR), the 0-line must be adjusted again.

5.5 Program

The **BV** version offers four program selections (**P1-P4**) and the **BVR** six ones (**P1-P6**).

The programs 1-3 are made for welding with weaving motion, 4 and 6 for longitudinal welding. Program 5 is for frame welding and is to be programmed before program 6.

Program 1 = P1

| | | |
|--|--|--|
| | | <p>Select termination angle: 90°, 45° or 22° (see pos. 4 on page 12)</p> <p>Normal weaving</p> <p>Select weaving width</p> |
|--|--|--|

1

2

1. Program the weaving width in mm.

2. Red lamp is to light.

Program 2 = P2

| | | |
|--|------------|---|
| | <p>45°</p> | <p>Select termination angle: 90°, 45° or 22° (see pos. 4 on page 12)</p> <p>Normal weaving</p> <p>Start angle: 45° (in P2 the angle of the start distance always is 45°)</p> |
|--|------------|---|

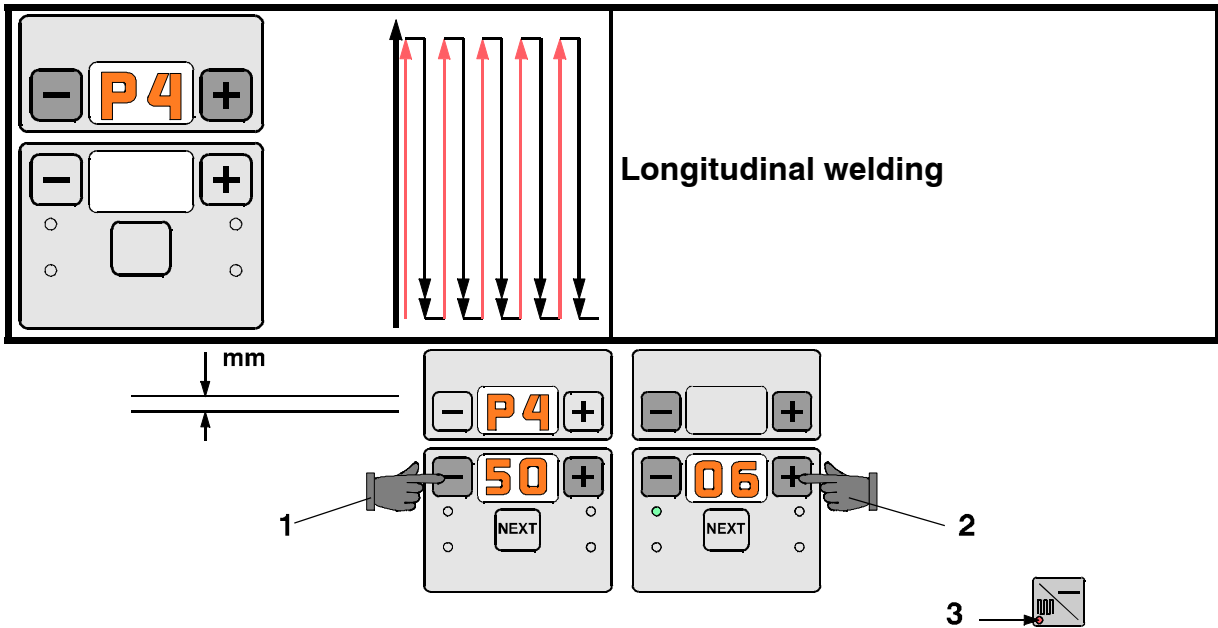
1. Program the weaving width in mm.
2. Red lamp is to light

Program 3 = P3

| | | |
|--|--|--|
| | | <p>Select termination angle: 90°, 45° or 22° (see pos. 4 on page 12)</p> <p>Normal weaving</p> <p>Start distance of optional length</p> |
|--|--|--|

1. Program the length in cm.
2. Program the weaving width in mm.
3. Red lamp is to light.

Program 4 = P4

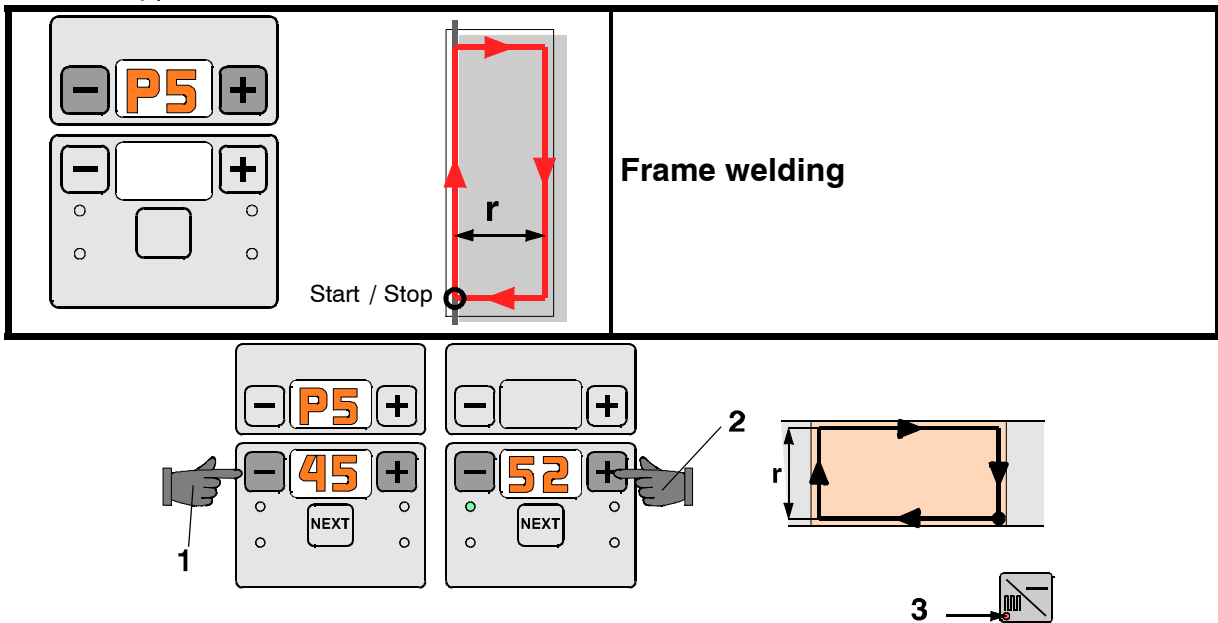


1. Program the welding speed in cm/min
2. Program the distance between the runs in mm.
3. Red lamp is to light.

Program P5 and P6 (for BVR)

Program 5 = P5

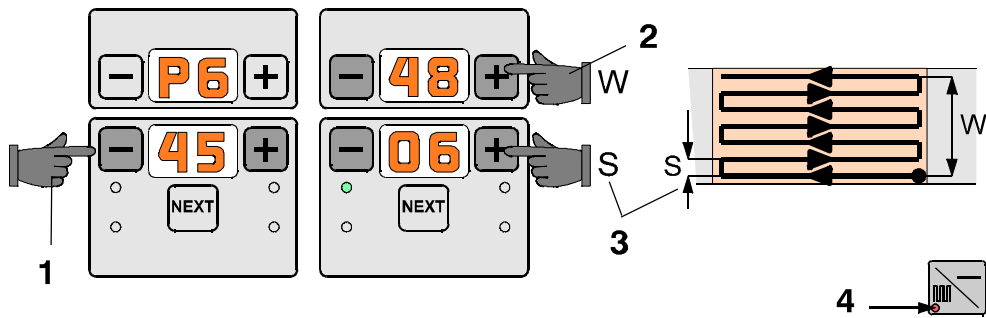
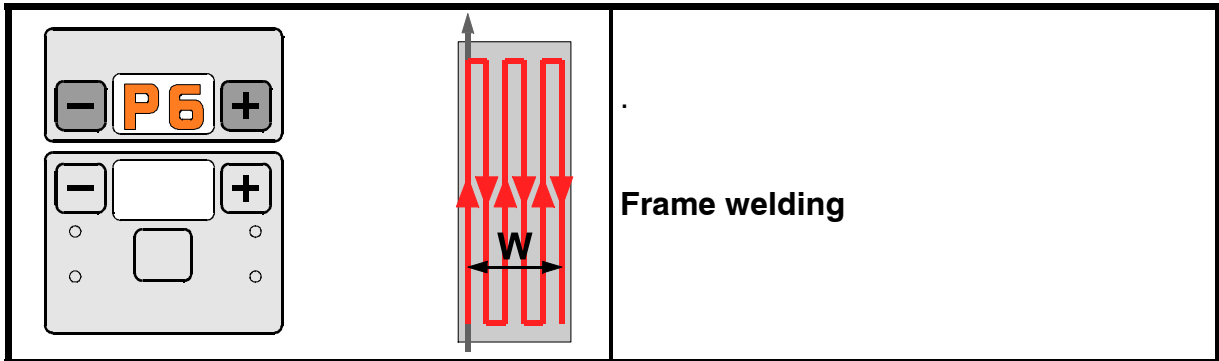
Before start the travel carriage must be positioned on the starting point (indicated by a red lamp).



1. Program the welding speed in cm/min.
2. Program the width of the frame in mm.
3. Red lamp is to light.

Program 6 = P6

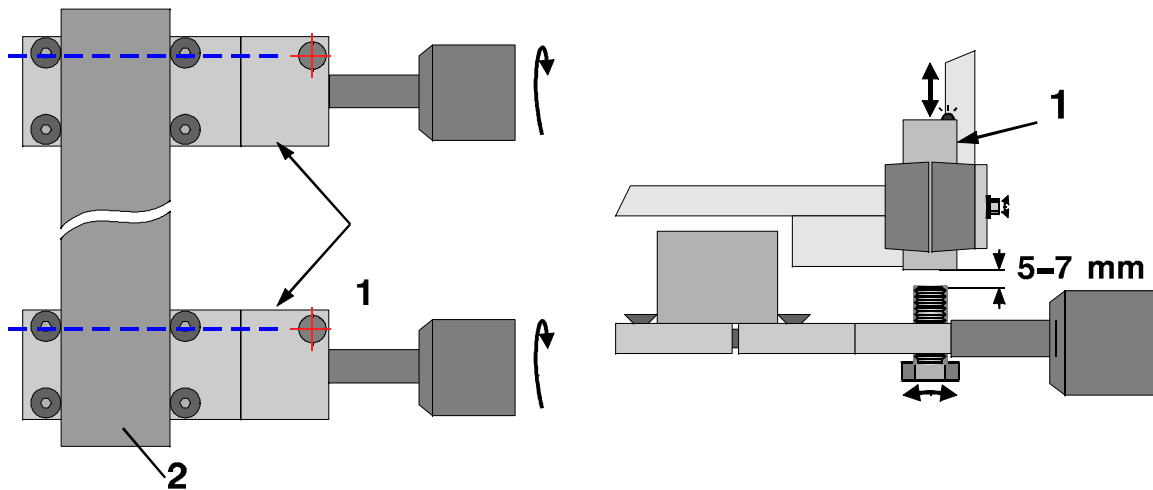
Program 6 is for filling the frame. The welding stops when the frame is filled up.



1. Program the welding speed in cm/min.
2. Program the width in mm.
3. Program the distance between the runs in mm.
4. Red lamp is to light.

In the programs 5 and 6 the length of the weld is limited by two sensors.

When the carriage reaches the sensors the travel direction is changed.



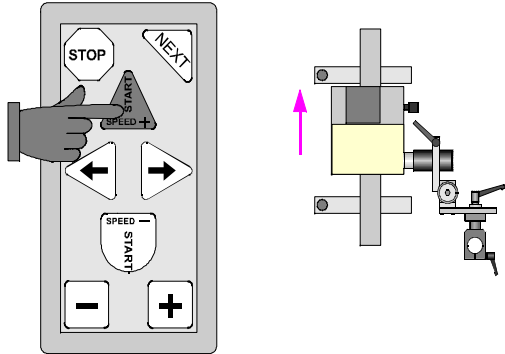
1. Sensor

2. Rail

5.6 Remote Control Unit

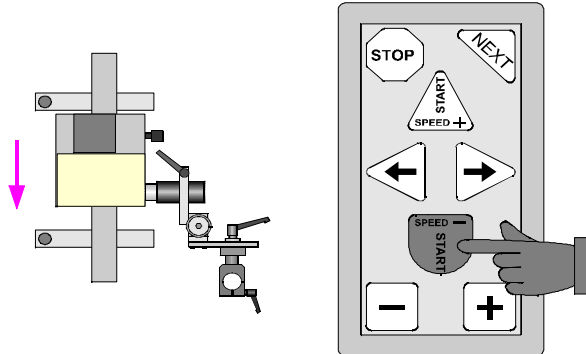
For **travel** in the direction of the arrow:
Click **START SPEED+** once.

For **rapid transport**: Hold down for two seconds.

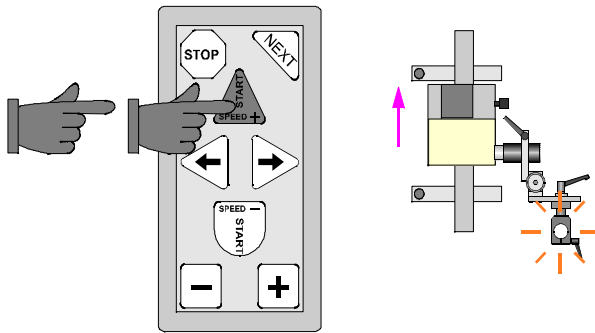


For **travel** in the direction of the arrow:
Click **START SPEED-** once.

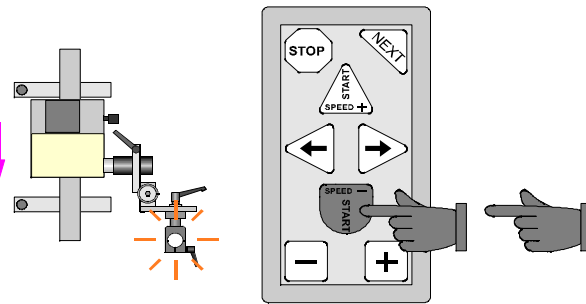
For **rapid transport**: Hold down for two seconds.



For **travel** in the direction of the arrow:
Double-click on **START SPEED+**.

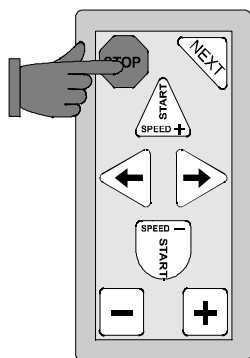


For **travel** in the direction of the arrow:
Double-click on **START SPEED-**.



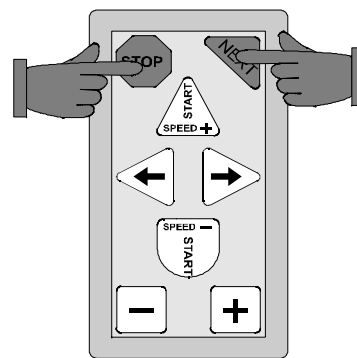
STOP

Click the **STOP** button.

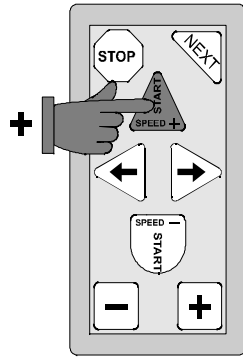


For **STOP** with backfill:

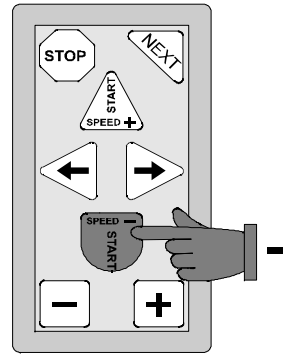
Hold down **NEXT**. Then click **STOP**.



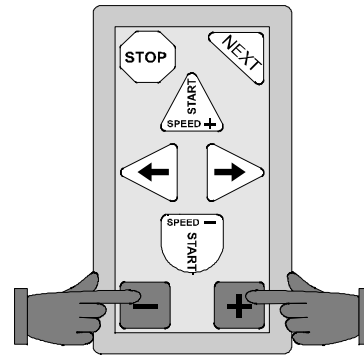
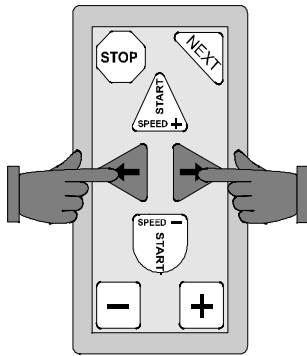
For **increase** or **decrease** of the **advancing speed** in the course of welding.



0-line displacement

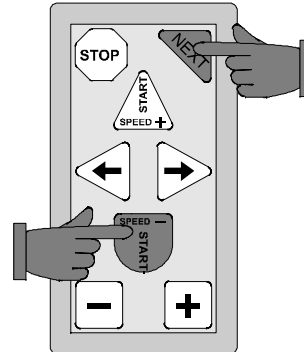
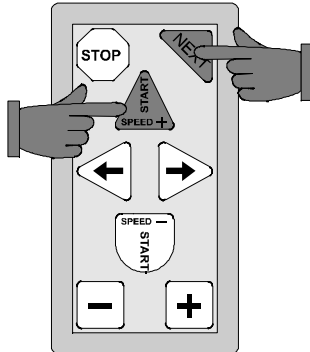


Changing the weaving width



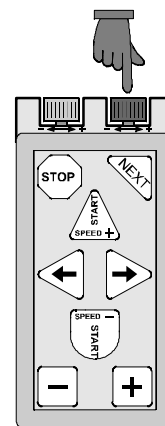
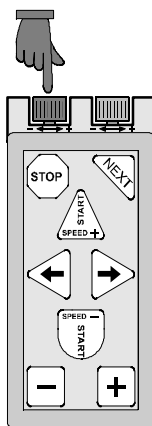
To step **up** by one program:
Hold down **NEXT**. Then click **SPEED+**.

To step **down** by one program:
Hold down **NEXT**. Then click **SPEED-**.



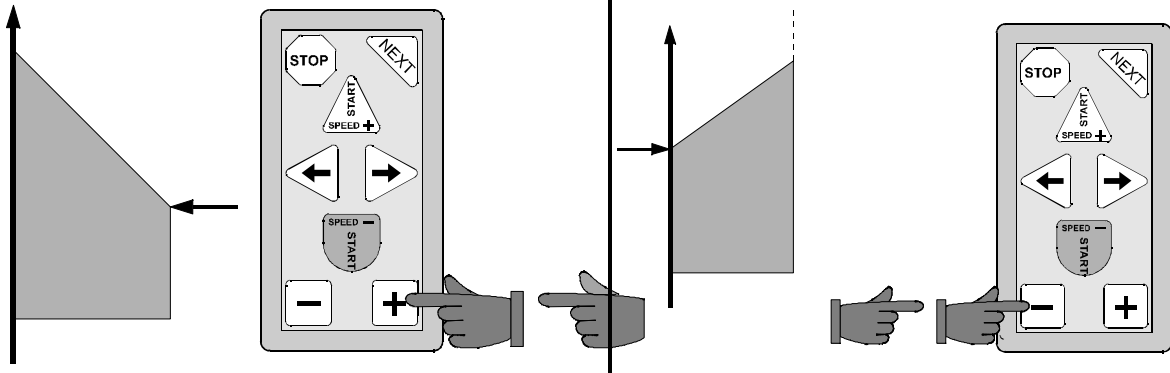
**Remote control of the welding volt-
age**

**Remote control of the welding cur-
rent**

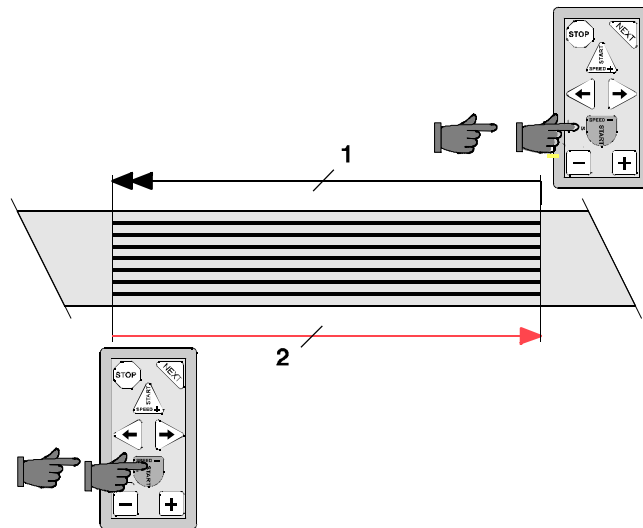


Changing from normal weaving width to decreasing width to the left:
Double-click on +.

Changing from normal weaving width to decreasing width to the right:
Double-click on -.



Going over from rapid transport to welding: Double-click
(Applies only to program 4)



- 1. Welding transport (welding OFF).
- 2. Welding speed (welding ON).

6 MAINTENANCE

6.1 General

Note:

All warranty undertakings given by the supplier cease to apply if the customer attempts to rectify any faults on the machine during the warranty period.

Every day:

Check that the cables and plugs are intact.

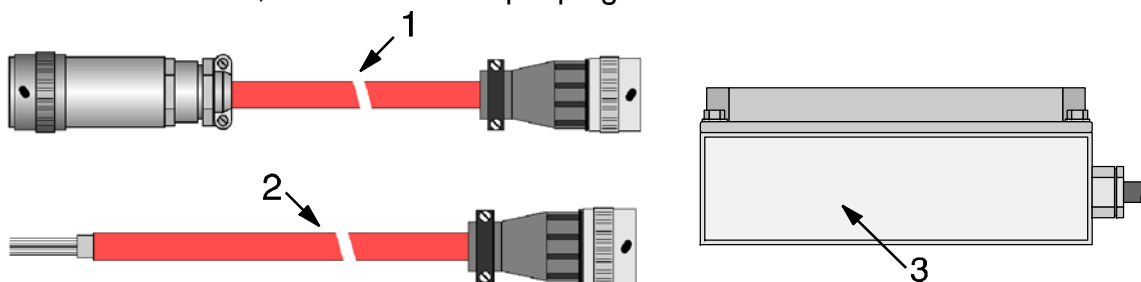
Inspect the rail for damage.

Clean the travel carriage and the attachment of the torch.

7 ACCESSORIES

7.1 General

- | | |
|--|--------------|
| 1. Control cable (12p-23p) Railtrac -MEK | 0457 360 880 |
| 2. Universal connection cable 12-pin plug | 0457 360 881 |
| 3. Transformer 230/36 VAC with 12-pin plug | 0457 467 880 |



- | | |
|---|--------------|
| Control cable (4p-12p) Railtrac -MED304/MEH44 | 0457 360 883 |
| Adapter set with 4-pin chassis connector | 0443 341 880 |
| Floating welding head | 0398 145 211 |

A **floating welding head** holds the torch of the welding or cutting equipment at a constant height above the surface in the course of welding.

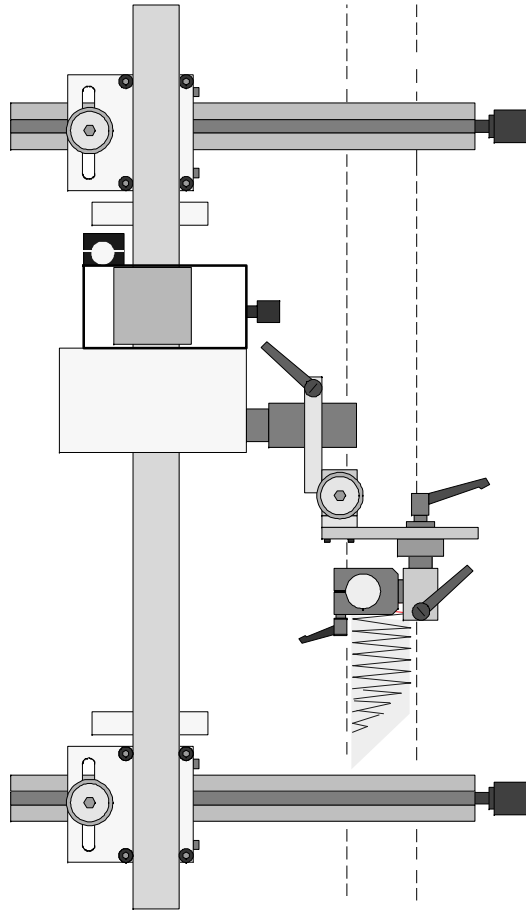
To enable correct weaving motions also in troublesome positions the weaving unit can be fitted with supports for turning and tilting.

8 ORDERING OF SPARE PARTS

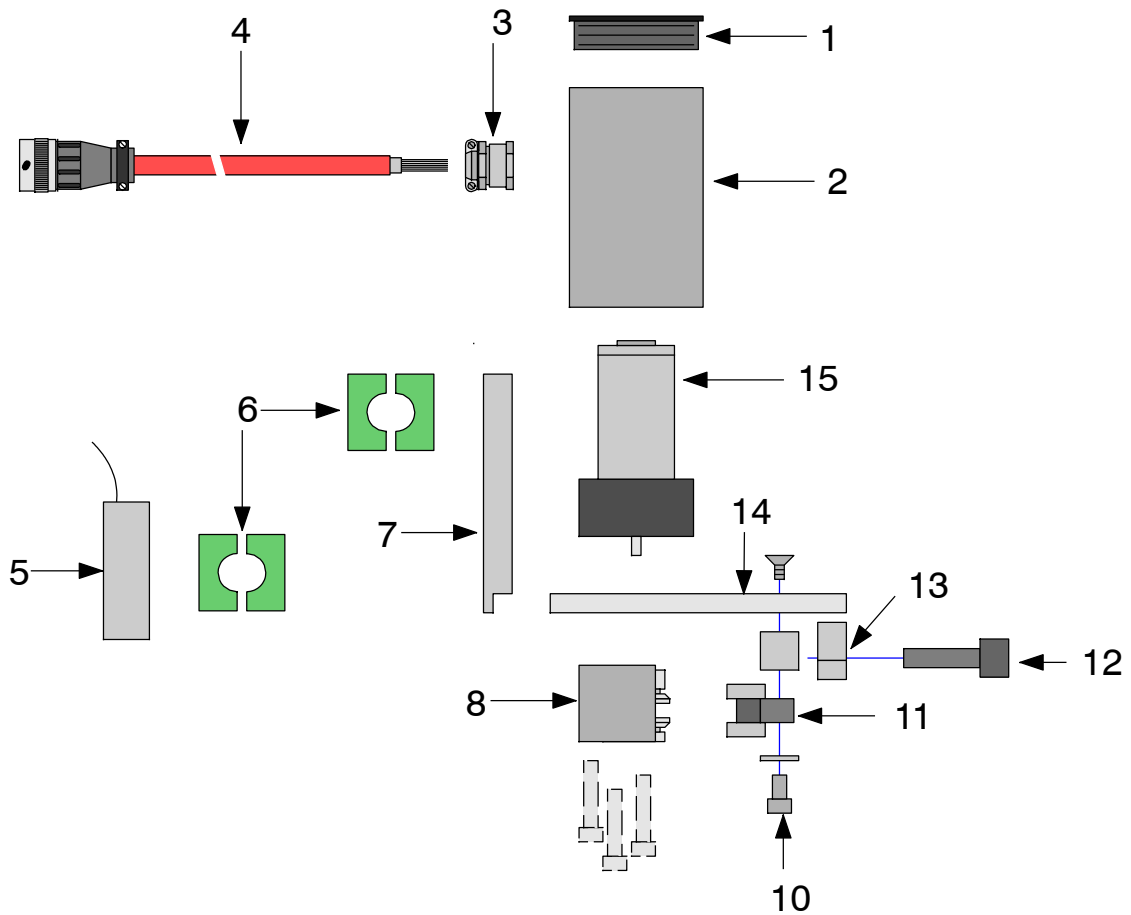
Spare parts are ordered through your nearest ESAB representative, see back cover. When ordering spare parts, please state machine type and number as well as designation and spare part number as shown in the spare parts list on page 23. This will simplify dispatch and ensure you get the right part.

Spare parts list

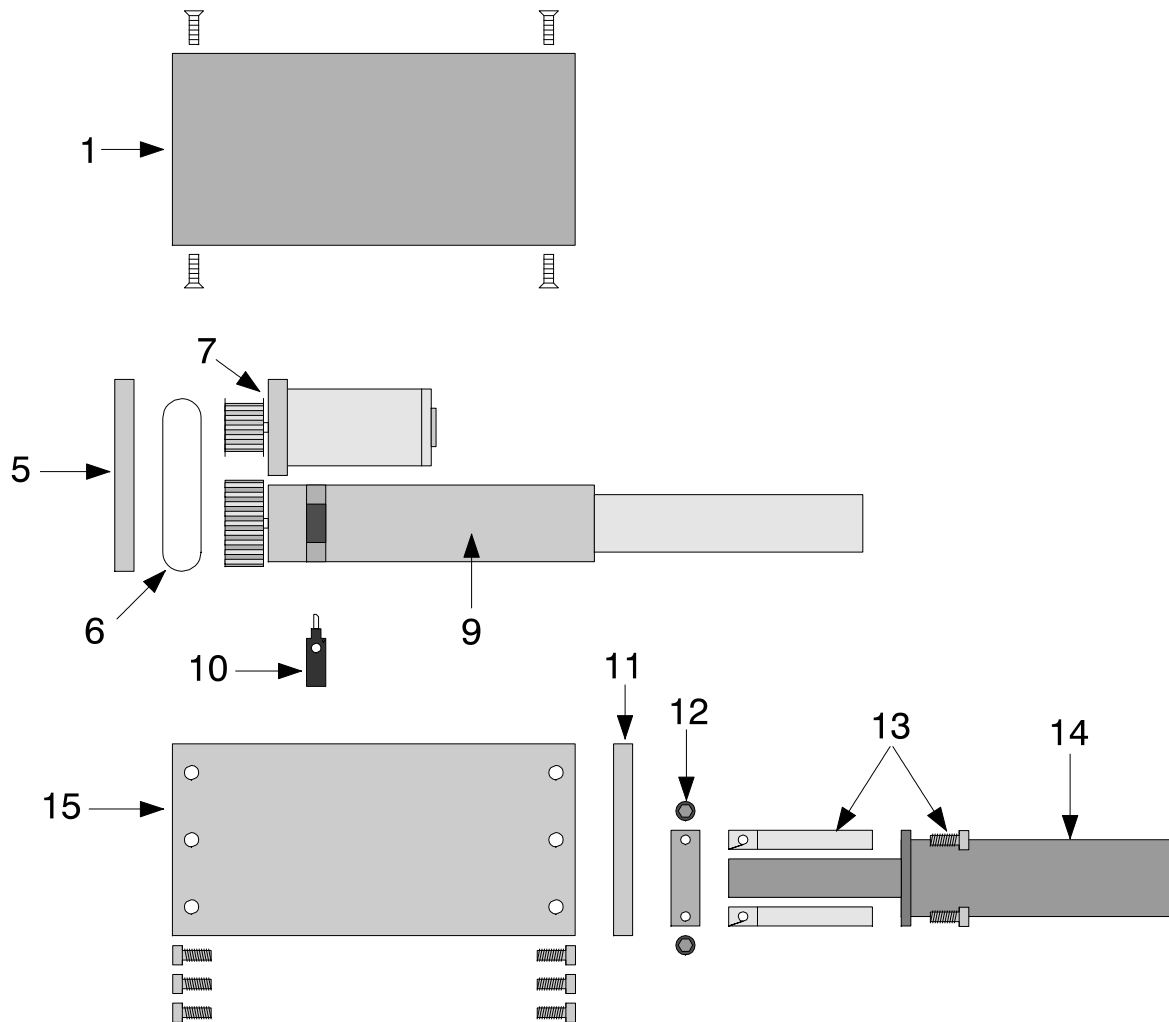
Edition 2000-02-09



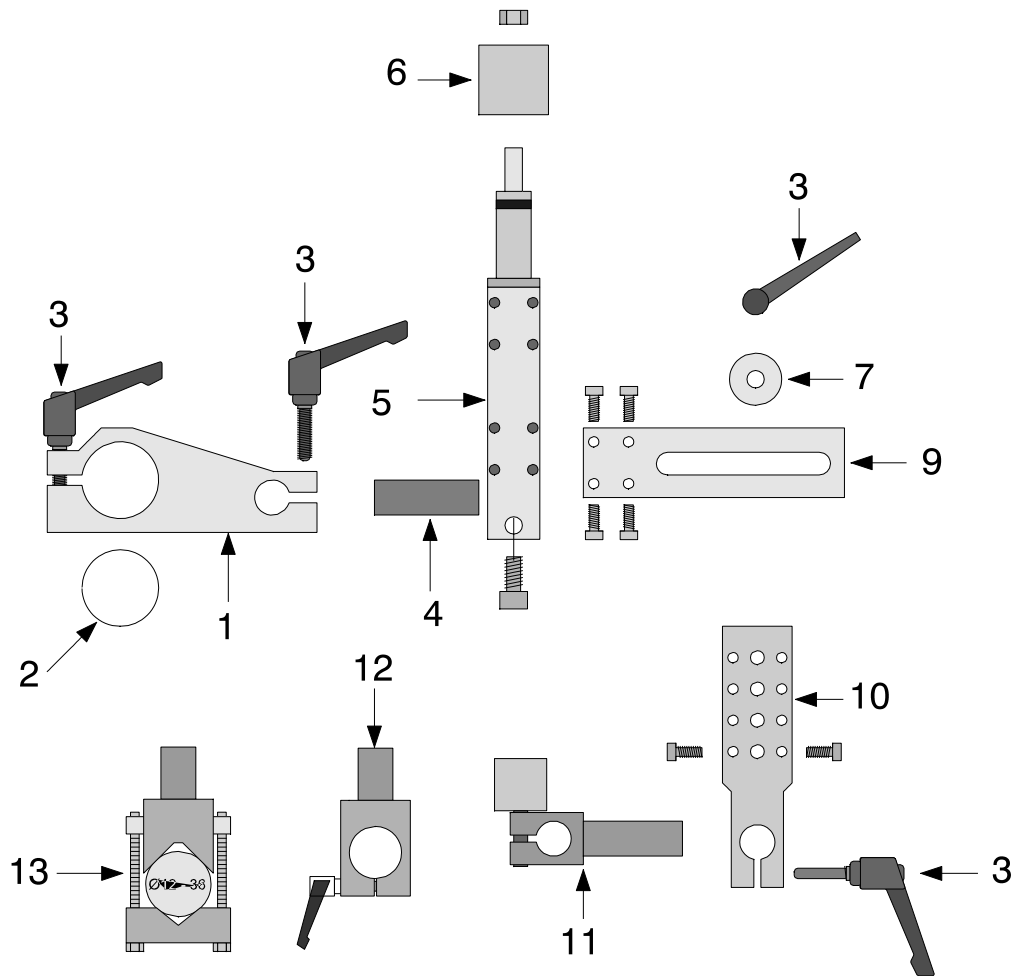
| Item no. | Ordering no. | Denomination | Notes |
|----------|--------------|------------------------|-------|
| | | Carriage | |
| 1 | 0398145501 | Plastic cover | |
| 2 | 0398145509 | Motor box BV | |
| 3 | 0398145503 | Cable release | |
| 4 | 0398145525 | Motor cable | |
| 5 | 0398145290 | Inductive sensor (BVR) | |
| 6 | 0398145506 | Torch cable release | |
| 7 | 0398145507 | Cable bracket | |
| 8 | 0398145508 | Drive wheel bracket | |
| 10 | 0398145510 | Distance with screw | |
| 11 | 0398145511 | Locking arm | |
| 12 | 0398145512 | Lock screw | |
| 13 | 0398145513 | Bracket for lock screw | |
| 14 | 0398145514 | Mounting plate | |
| 15 | 0398145515 | Motor and Gear | |



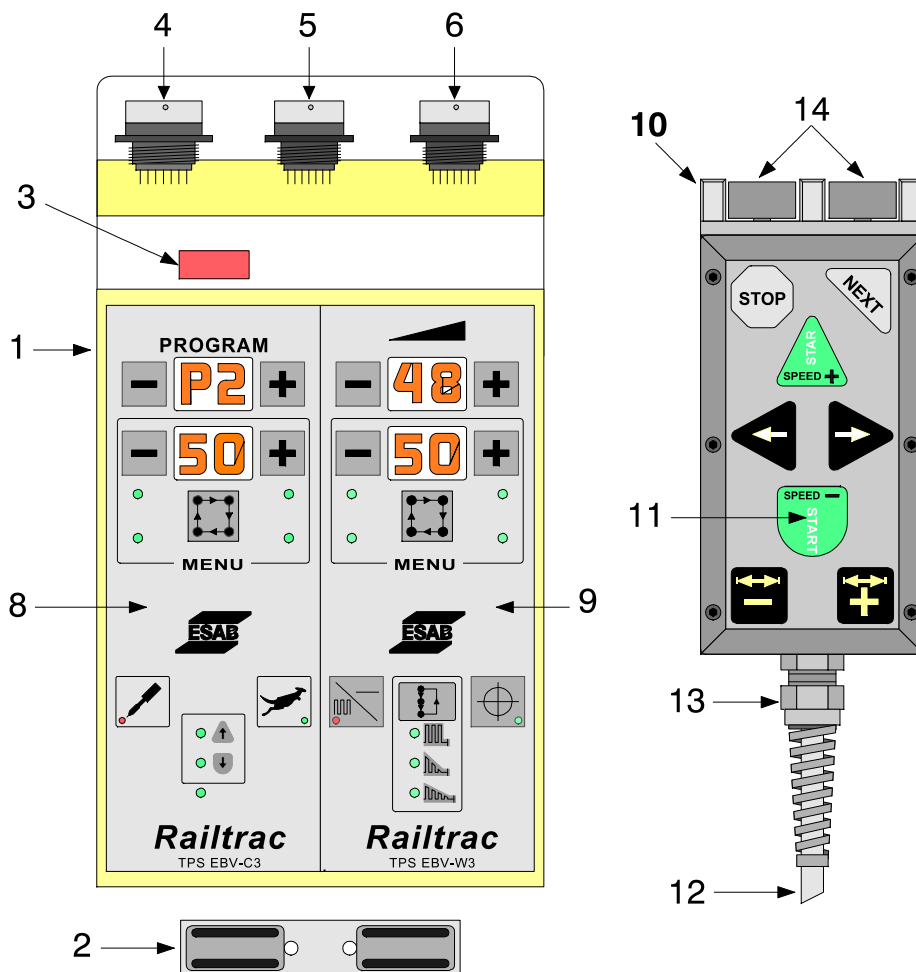
| Item no. | Ordering no. | Denomination | Notes |
|----------|--------------|---------------------|-------|
| | | Weaving unit | |
| 1 | 0398145631 | Alu cover | |
| 5 | 0398145632 | Backplate | |
| 6 | 0398145606 | Time belt | |
| 7 | 0398145607 | Motor w. belt wheel | |
| 9 | 0398145633 | Weaving guide | |
| 10 | 0398145610 | Inductive sensor | |
| 11 | 0398145611 | Frontplate | |
| 12 | 0398145612 | Guide bracket | |
| 13 | 0398145634 | Steering bars | |
| 14 | 0398145635 | Outer guide | |
| 15 | 0398145636 | Bottom plate | |



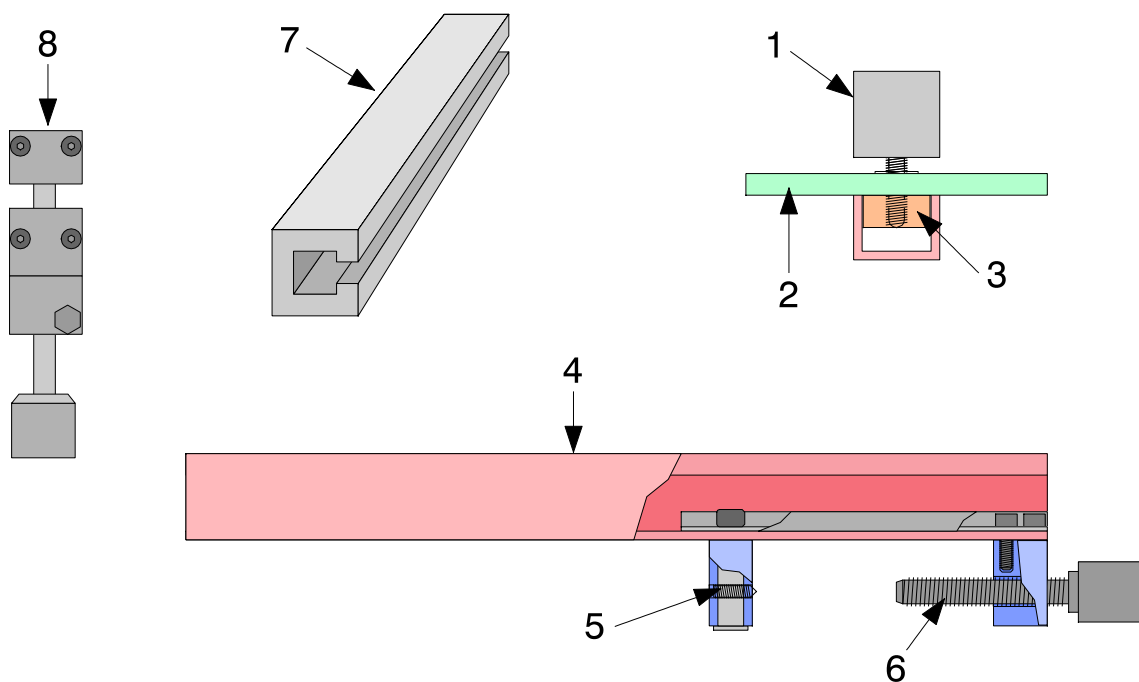
| Item no. | Ordering no. | Denomination | Notes |
|----------|--------------|------------------------|-------|
| | | Slide | |
| 1 | 0398145801 | Slide bracket | |
| 2 | 0398145802 | Bushing | |
| 3 | 0417855009 | Lever | |
| 4 | 0398145803 | Bar | |
| 5 | 0398145804 | Slide house | |
| 6 | 0417855001 | Knob | |
| 7 | 0398145805 | Disc | |
| 9 | 0398145806 | Straight slide bracket | |
| 10 | 0398145807 | Bracket plate | |
| 11 | 0398145808 | Intermediate bracket | |
| 12 | 0398145101 | Torch holder PSF | |
| 13 | 0398145100 | Torch holder Universal | |



| Item no. | Ordering no. | Denomination | Notes |
|----------|-------------------|-----------------------------|-----------------|
| | 0398145177 | Control box complete | BV 1000 |
| | 0398145180 | Control box complete | BVR 1000 |
| 1 | 0398146901 | Controlbox cabinet | |
| 2 | 0398145903 | Magnet box | |
| 3 | 0417855010 | Stop button | |
| 4 | 0398145909 | 19-pin female chassis | |
| 5 | 0398145908 | 12-pin male chassis | |
| 6 | 0398145906 | 12-pin female chassis | |
| 8 | 0398145926 | Control unit carriage | BV 1000 |
| | 0398145928 | Control unit carriage | BVR 1000 |
| 9 | 0398145927 | Control unit weaving | |
| 10 | 0398145942 | Remote control complete | |
| 11 | 0398145943 | Front panel remote | |
| 12 | 0398145951 | Cable with 19-pin plug | |
| 13 | 0398145944 | Cable release | |
| 14a | 0457468032 | Knob | |
| 14b | 0457468040 | Potentiometer | |



| Item no. | Ordering no. | Denomination | Notes |
|----------|-------------------|------------------------------|-----------------------|
| | 0398145190 | Rail bracket complete | (Item no. 1-6) |
| 1 | 0398145401 | Knob | |
| 2 | 0398145402 | Alu-bracket | |
| 3 | 0398145403 | Guide | |
| 4 | 0398145404 | Rail bracket | |
| 5 | 0398145405 | Screw | |
| 6 | 0398145406 | Locking screw | |
| 7 | 0398145122 | BV-rail 2m | |
| 8 | 0398145115 | Start/stop bracket (2 pcs) | |



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| | | | |
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