

# Operating instructions

For owners and persons using the machine

## Welding turntable

# DVR 50 (AVC) DVR 100 (AVC)



To ensure safe working read the operating instructions before commissioning. Retain the operating instructions for future reference.

Machine No.:

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# 1. ABOUT THESE INSTRUCTIONS

## 1.1 Warning messages

The warnings used in these instructions warn you of injuries or damage to property. Always read and observe these warnings!



This is a warning symbol. It warns against dangers of injury. In order to avoid injuries or death observe the measures marked with a safety sign.

WARNING LEVEL	MEANING
 <b>DANGER!</b>	Imminently hazardous situation that results in death or serious injuries if the safety measures are not observed.
 <b>WARNING!</b>	Potentially hazardous situation that may result in death or serious injuries if the safety measures are not observed.
 <b>CAUTION!</b>	Potentially hazardous situation that may result in slight injuries if the safety measures are not observed.
 <b>NOTE!</b>	Potentially hazardous situation that may result in material damage if the safety measures are not observed.

## 1.2 Further symbols and displays

SYMBOL	MEANING
	Important information for comprehension.
1. 2. 3. ...	Request for action in a sequence of actions: Action is required here.
	Single request for action: Action is required here.

## 1.3 Abbreviations

ABBREVIATION	MEANING
DVR	Turning gear/welding turntables

## 1.4 Further applicable documents

The following documents form part of these operating instructions:

- Operating instructions of the welding power source of the ORBIMAT series

## 2. OWNER INFORMATION AND SAFETY INSTRUCTIONS

### 2.1 Requirements for the owner

**Workshop/outdoor/field use:** The owner is responsible for safety in the danger zone around the machine, and should allow only qualified personnel to enter the zone or operate the machine in the danger zone.

**Employee safety:** The owner has to observe the safety regulations described in this chapter as well as has to work safety-consciously and with all prescribed protective equipment.

The employer undertakes to give the employees clear notice of the dangers arising that are specified in the EMF directives and to evaluate the workplace correspondingly.

**Requirements for special EMF evaluations with regard to general activities, working materials and workplaces\*:**

TYPE OF WORKING MATERIALS OR WORKPLACE	EVALUATION REQUIRED FOR:		
	Employees without particular risk  (1)	Employees at particular risk (with the exception of those with active implants)  (2)	Employees with active implants  (3)
Arc welding, manual (including MIG (Metal Inert Gas), MAG (Metal Active Gas), TIG (Tungsten Inert Gas)) under observance of tried-and-tested procedures and without physical contact to the line	No	No	Yes

\* To Directive 2013/35/EU

### 2.2 Using the machine

#### 2.2.1 Intended use

The welding turntables are intended solely for the following use:

- Utilization in combination with an Orbital welding power source of the ORBIMAT series.
- TIG welding of materials and tube dimensions that are specified in these operating instructions (see chap. 4, page 15).
- Empty unpressurized tubes that are free of contaminations, explosive atmospheres or liquids.

Only protective gases that are classified for TIG welding in accordance with EN ISO 14175 may be used.

Proper use also includes the following points:

- Permanent supervision of the machine during operation. The operator must always be able to stop the process.
- Observing all safety and warning information in these operating instructions.
- Observing of the further applicable documents.
- Complying with all inspection and maintenance work.
- Use of the machine solely in its original state.
- Usage solely of original accessories as well as original spare parts and operating materials.
- Checking of all the safety-relevant items and functions before commissioning.

- Processing of those materials named in the operating instructions.
- Proper usage of all components involved in the welding processes as well as of all further factors that have an influence on the welding process.
- Solely commercial usage.
- The structures on the turning plate must have a secure fixed connection in such a manner that the structures form a unit with the turning plate. The fact that the welding turntable can be tilted must always be taken into consideration. Dangerous situations for the operating personnel may **not** result through structures.
- The rotary drive must only be used when the tilting device is in a secured working position.
- The welding turntable is used to hold a workpiece support, which must be firmly connected with the turntable. The correspondingly mounted object is only rotated by the device. Additional mechanical connections to the turntable must not be established.
- In particular the turning gear must not be used for winding processes or to drive other mechanical structures. The weight of the workpiece must not exceed the permissible overall weight in chap. 5, p. 16 for center of gravity distance of 100 mm (3.937") to the face plate. The holder as well as the workpiece must be attached centrally on the turntable.
- The tilting device is used to tilt the rotating axis. The tilting device must only be used when a free movement of the rotating unit including mounted device and workpiece is ensured.
- The control unit does not contain an interface to a power source. For operation with a welding power supply the reference potential of the power source must be realized at the provided stud bolt with sufficient cross-section. The weld current must not exceed the current amperage specified in chap. 5, p. 16. Otherwise the current transmitter might be damaged and the operational safety of the set-up is not ensured.
- All work on electronic equipment must only be performed by professional electricians.
- All structures and attachments have to be designed in such a way that **no** dangerous situations can occur for the personnel .

### 2.2.2 Machine constraints

- The workplace can be in the tube preparation, in plant construction or in the plant itself.
- The machine is operated by one person.
- Erect the machine solely on a solid surface. The device has to be anchored in the floor.
- A radial space requirement/freedom of movement for people of approx. 2 m around the machine is required.
- Work lighting: min. 300 Lux.
- Climate conditions: -15 °C to 40 °C; < 80% rel. humidity.
- Only work with the machine in dry surroundings (not in misty, rainy or stormy conditions). If appropriate, use a welding tent.

## 2.3 Environmental protection and disposal

### 2.3.1 Cooling liquid

Dispose of cooling liquid in accordance with the local statutory regulations.

### 2.3.2 Electric tools and accessories


Used-up power tools and accessories contain a large amount of valuable raw materials and plastics which can be recycled:

- Used electronic devices marked with the adjacent symbol may not be disposed of with household waste in accordance with EU directives.
- By actively using the offered return and collection systems, you are doing your part to reuse and recycle used electronic devices.
- Used electronic devices contain parts that must be handled selectively according to the EU directive. Separate collection and selective treatment are the basis for environmentally responsible disposal and protection of human health.
- We will properly dispose of devices and machines from Orbitalum Tools GmbH purchased after August 13th, 2005 if they are sent to us postage-paid.
- In the case of used electronic devices which may represent a risk to human health or safety due to contamination during use, we have the option of refusing return.
- The user is responsible for disposing of used electronic devices purchased before August 13th, 2005. For this purpose, please contact a professional disposal company in your area.
- **Important note for Germany:** Devices and machines of Orbitalum Tools GmbH may not be disposed of at communal dumps, as they are only used in the commercial sector.



  
(as per RL 2002/96/EC)

## 2.4 Personnel qualification

 **CAUTION!** The welding turntable may only be used by instructed personnel.

- Minimum age: 18 years old.
- No physical impairments.
- Operation of the machine by underage persons only under supervision by a person authorized to issue instructions.
- A basic knowledge of TIG welding is advisable.

## 2.5 Fundamental information on operational safety

 **CAUTION!** Observe valid safety and accident prevention regulations.

Improper usage can impair safety. This can result in life-threatening injuries.

- ▶ **Never** leave the welding turntable unattended when the welding power source is switched on.
- ▶ The operator must ensure that no 2nd person is located within the danger zone.
- ▶ The operator must ensure that the workpiece can move completely freely.
- ▶ **Do not** modify or convert the welding turntable.
- ▶ Use the welding turntable only in a proper operating condition.
- ▶ Use only genuine tools, spare parts and accessories as well as specified operating materials.
- ▶ **Do not** remove safety devices.
- ▶ In case of changes in the operating behavior, stop operation immediately and have the fault eliminated.



## 2.6 Personal protective equipment

The following personal protective equipment must be worn while working at the system:

- ▶ Safety gloves 1/1/1/1 in accordance with EN 388 or 1/2/1/1 EN 407.
- ▶ Safety gloves DIN 12477, Type A for welding operation and DIN 388, Class 4 for mounting the electrode.
- ▶ Safety shoes to EN ISO 20345, Class SB.
- ▶ Eye protection to EN 170 and skin-covering safety clothing.


## 2.7 Remaining risks

### 2.7.1 Injury through high weight


Depending on the version, the welding turntable can have a weight of up to 100 kg (220 lbs) in a packed state (including hose package and transport case). A significant health hazard exists during lifting.

Danger of impact and crushing exists in the following situations:

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 **CAUTION!** Falling of the welding turntable during transportation, mounting/dismantling or setting up.

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 **WARNING!** Danger of injury through high weight of the welding turntable!


- ▶ Always lift the welding turntable with two persons or use a suitable means of transport.
- ▶ Danger of accidents through impermissible transport of devices that cannot be transported by crane! Using a crane and suspending the device is not permissible! The device may fall down and injure persons! Handles and mounts are solely suitable for transport by hand!
- ▶ The device is not suitable for transporting by crane or suspension!

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- ▶ The welding turntable **must not** be used to transport persons.
- ▶ Wear safety shoes to EN ISO 20345, Class B.

### 2.7.2 Prick injury through pointed electrode

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 **CAUTION!** Danger of being pricked by the electrode for the operator as well as for third parties while grasping the machine welding torch.

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- ▶ **Do not** grasp the machine welding torch at the position of the electrode.
- ▶ Before transporting and storing the welding turntable: Remove the electrode.

### 2.7.3 Danger of crushing through rotating turntable and chuck

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 **CAUTION!** Danger of crushing!

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Danger of crushing exists in the following situations:

- The turning plate and chuck starts up unintentionally during setting up. Hands and fingers are crushed.
- Hair and clothes can be caught.
- ▶ Wear tight-fitting clothes.
- ▶ **Do not** wear open hair, jewelry or other accessories that can be easily drawn in.
- ▶ Before connecting the welding turntable and before mounting the electrode: Switch off the control unit of the orbital welding system.

### 2.7.4 Danger of crushing through being caught in by moving parts


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 **CAUTION!** Hands and fingers can be caught in and crushed while setting up the welding turntable.

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### 2.7.5 Danger of cuts at sharp edges

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 **CAUTION!** Danger of cut injuries caused by sharp tube edges when positioning the welding turntable at the tube.

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- ▶ Wear safety gloves to EN 388, Performance level 2.

### 2.7.6 Burns and danger of fire through high temperatures

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 **CAUTION!** The welding turntable is hot after welding. Very high temperatures arise in particular after several consecutive welding processes. When working on the welding turntable (for example when changing clamps or mounting/removing the electrodes) there is a danger of burns or damage to the points of contact. Materials without thermal resistance can be damaged when coming into contact with the hot welding turntable.

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 **WARNING!** Thermal problems can arise in the case of incorrect positioning of the forming system or the use of impermissible materials in the welding area. In the worst case a fire will be started. Observe the local general fire protection measures.

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- ▶ Wear safety gloves.
- ▶ Wait until the surfaces have cooled down to below 50 °C before working on the welding turntable or before transport.
- ▶ Position the forming system correctly.
- ▶ Use only permissible materials in the welding area.

### 2.7.7 Tripping over the hose package and lines

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 **CAUTION!** If the hose package and lines are under tension, there is the danger that persons may trip over them and be injured.

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 **WARNING!** Tripping over could cause the plug to be pulled out so that in the worst case an arc may arise between the plug and the Orbital weld system and the turntable ground connection. Burns and glaring light may be the result.

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- ▶ Ensure that under **no** circumstances can people trip over the hose package.
- ▶ **Do not** place the hose package under tension. Ensure that the hose package is connected properly and that the strain relief is attached.

### 2.7.8 Electric shock

The relevant standards and regulations have been considered.


There are no additional dangers for the user in case of proper use of the equipment and without force majeure.

The turning gear is grounded. Since with the exception of the protective hoses and lines no components which can absorb static electricity during normal operation were installed and under consideration of the operation location, no danger to the user is to be expected.


Two electrical potentials are applied during the welding process:

- Potential 1: Electrode.
- Potential 2: Remaining components of the welding turntable incl. pipe.

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 **WARNING!** Danger of an electric shock at simultaneous contact with both potentials during the high-frequency ignition.

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 **DANGER!** Risk of death for people with heart problems or cardiac pacemakers.

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- ▶ From the start of the welding process avoid contact with the tube and the housing of the Orbital weld head.

### 2.7.9 Damage to eyes through radiation

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 **WARNING!** During the welding process infrared, glaring and ultraviolet rays arise that can seriously damage the eyes.

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- ▶ Wear eye protection according to EN170.

### 2.7.10 Dangers through electromagnetic fields

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 **DANGER!** Depending on the form of the workplace, life-threatening electromagnetic fields can arise in the direct vicinity.

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- ▶ People with heart problems or cardiac pacemakers may **not** operate the welding system.
- ▶ The owner has to ensure safe design of the workplace in accordance with the EMF Directive 2013/35/EU.

### 2.7.11 Dangers through faulty mounting

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 **WARNING!** An unsafe standing position or the installation on an incline may result in a dangerous situation for the user!

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Holes to anchor the turntables with a suitable surface are located on the base frame.

### 2.7.12 Danger through loose or dangerous structures

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 **WARNING!** Improper installation of structures and workpieces can lead to very dangerous situations!

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### 2.7.13 Risk of suffocation through an excessive argon share in the air

**DANGER!**

If the argon share in the air rises above 50%, lasting damage or risk of death can arise through suffocation.

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- ▶ Ensure sufficient ventilation in rooms.
- ▶ If necessary, monitor the oxygen level in the air.

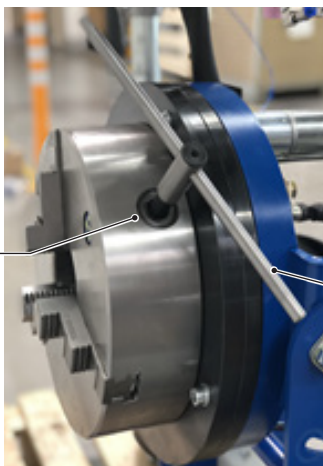
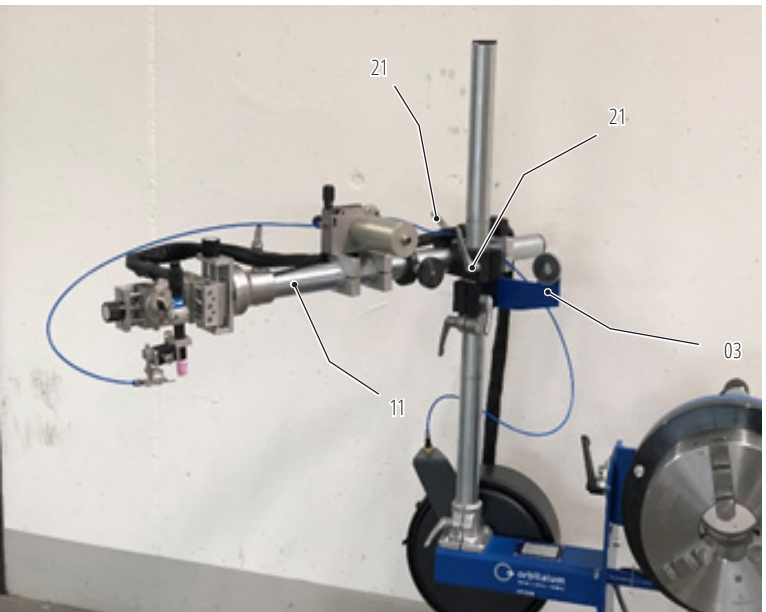
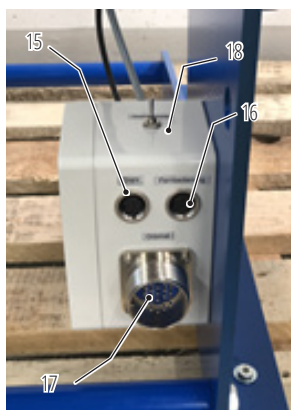
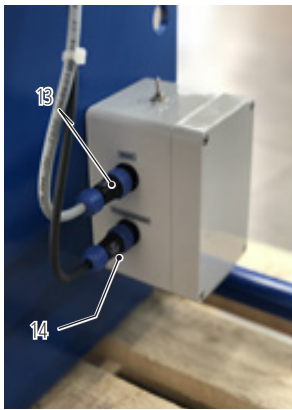
### 2.7.14 General injuries through tools

**CAUTION!**

Injuries can occur during dismantling for proper disposal of the welding turntable through uncertainties in handling tools.

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### 3. DESCRIPTION




1	TIG machine welding torch
2	Compound slides
3	Position limit stop torch swivel arm
4	Clamping chuck
5	Locking lever swivel adjustment
6	Signal distribution box
7	Ground plug
8	Swivel block
9	Fastening hole
10	Stand arm
11	Torch swiveling arm
12	Securing clamp
13	Connection socket motor
14	Connection socket limit switch
15	Connection socket cold wire
16	Connection socket remote control
17	Connection socket control cable
18	Switch, turning plate direction of rotation
19	Chuck key lock
20	Chuck key
21	Clamping lever clamping block
22	Adjustment knob compound slide

### 3.1 Warning signs

The warning and safety instructions attached to the machine must be observed.

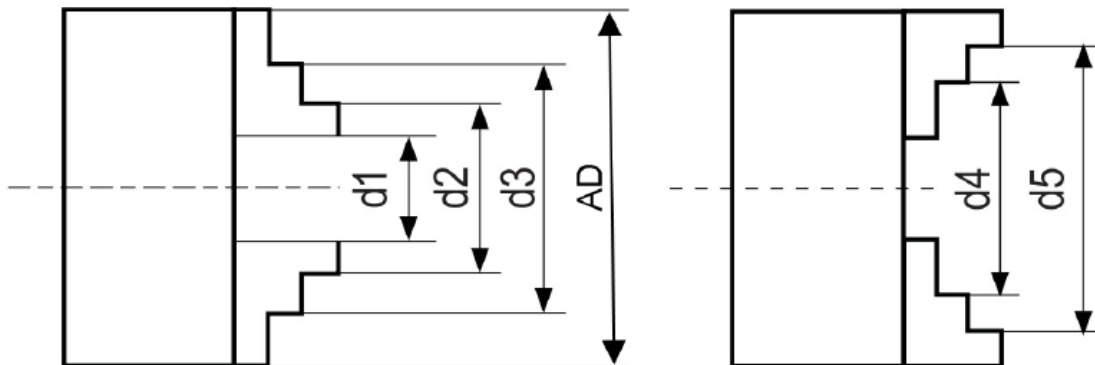
The warning signs are part of the machine. They must not be removed or changed. Missing or illegible warning signs must be replaced immediately.

FIGURE	POSITION ON MACHINE	MEANING	CODE
	Base plate of the clamping chuck	Read the safety instructions!	871 001 057

## 4. SCOPE OF APPLICATION

Welding process	Direct current tungsten inert gas (TIG-DC).
Materials	All materials that are fundamentally suitable for the TIG-DC welding process.

### 4.1 Clamping range three-jaw lathe chuck (optionally)



TYPE	OD	D1	D2	D3 MAX.	D4 MAX.	D5 MAX.
DVR 50	200 mm	4 - 90 mm	52 - 135 mm	120 - 202 mm	60 - 145 mm	130 - 200 mm
DVR 100	250 mm	5 - 118 mm	62 - 174 mm	145 - 256 mm	77 - 188 mm	160 - 250 mm
DVR 100	300 mm	10 - 131 mm	78 - 200 mm	172 - 299 mm	90 - 215 mm	190 - 315 mm

## 5. TECHNICAL SPECIFICATIONS

ART		DVR 50	DVR 50 AVC	DVR 100	DVR 100 AVC
Code		855 000 011	855 000 012	855 000 001	855 000 002
<b>TURNTABLE</b>		<b>DVR 50</b>	<b>DVR 50 AVC</b>	<b>DVR 100</b>	<b>DVR 100 AVC</b>
Max. load in horizontal position (workpiece + lathe chuck), max.	[kg]	50	50	100	100
	[lbs]	110	110	220	220
Dimensions	[mm]	300 x 300 x 395	300 x 300 x 395	600 x 570 x 695	600 x 570 x 695
	[inch]	11.8 x 11.8 x 15.6	11.8 x 11.8 x 15.6	23.6 x 22.4 x 27.4	23.6 x 22.4 x 27.4
Distance floor to rotating axis	[mm]	279	279	590	590
	[inch]	11	11	23.2	23.2
Turntable can be tilted steplessly from 0 to 90°		●	●	●	●
Locking via two clamping levers		●	●	●	●
Turning plate Ø OD	[mm]	300	300	400	400
	[inch]	11.81	11.81	15.75	15.75
Hollow shaft Ø ID	[mm]	30	30	125	125
	[inch]	1.18	1.18	4.9	
Built-in weld power coupling for mass transfer to turning plate		●	●	●	●
Weld current built-in plug for ground cable connection		●	●	●	●
Limit switch for zero setting and speed calibration		●	●	●	●
Stand console for mounting the stand directly on the turntable		○	○	●	●
Mounting holes for floor fastening		●	●	●	●
Signal distribution box with connecting option for control cable ORBIMAT-DVR, turntable motor, limit switch, cold wire feed and remote control OWH BASIC		●	●	●	●
Tilt lever for selecting the direction of rotation		●	●	●	●
<b>STAND</b>		<b>DVR 50</b>	<b>DVR 50 AVC</b>	<b>DVR 100</b>	<b>DVR 100 AVC</b>
Weld torch stand mounted on console		○	○	●	●
Weld torch stand to be fastened separately		●	●	○	○
Base clamp with mounting holes for fastening at point of use		●	●	○	○
Dimensions stand tube OD x L:	[mm]	50 x 1200	50 x 1200	50 x 1200	50 x 1200
	[inch]	2 x 47.2	2 x 47.2	2 x 47.2	2 x 47.2
Dimensions extension arm OD x L:	[mm]	50 x 800	50 x 800	50 x 800	50 x 800
	[inch]	2 x 31.5	2 x 31.5	2 x 31.5	2 x 31.5
Extension swivel unit with magnetic stop for locking the welding position		●	●	●	●
Rough adjustment possible without tools via clamping lever, incl. cross-clamping unit		●	●	●	●
Three-coordinate support for torch fine adjustment. Linear adjustment path:.. each 50 mm (2")		●	●	●	●
Torch holder with ball head		●	○	●	○
<b>MACHINE TORCH</b>		<b>DVR 50</b>	<b>DVR 50 AVC</b>	<b>DVR 100</b>	<b>DVR 100 AVC</b>
Liquid-cooled machine torch with hose package length 4 m (13.12 ft)		●	●	●	●
Current carrying capacity DC: 250 A, AC: 180 A at 100% ED		●	●	●	●
Incl. standard torch equipment for electrode diameter 2.4 mm (0.09")		●	●	●	●
<b>AVC LINEAR UNIT*</b>		<b>DVR 50</b>	<b>DVR 50 AVC</b>	<b>DVR 100</b>	<b>DVR 100 AVC</b>



Arc gap control unit for automatic controlling and holding of the arc gap	○	●	○	●
Linear stroke: 55 mm	○	●	○	●

● = Function included

○ = Function not included

◐ = Function only conditionally included

\* Can only be used in combination with the orbital welding power sources ORBIMAT 300 CA AVC/OSC as well as ground cable for 300 CA AVC/OSC power sources


## 6. STORAGE AND TRANSPORT

### 6.1 Gross weights


ITEM		DVR 50	DVR 50 AVC	DVR 100	DVR 100 AVC
WEIGHT*	[kg]	45	50	100	105
	[lbs]	99	110	220	232

\* Incl. torch


### 6.2 Transporting the welding turntable

 **WARNING!** Danger of injury through high weight of the welding turntable!

- ▶ Always lift the welding turntable with two persons or use a suitable means of transport.
- ▶ Danger of accidents through impermissible transport of devices that cannot be transported by crane! Using a crane and suspending the device is not permissible! The device may fall down and injure persons! Handles and mounts are solely suitable for transport by hand!
- ▶ The device is not suitable for transporting by crane or suspension!

 **WARNING!** Danger of injury through pointed electrode!  
If the weld turntable is handled incorrectly, there is the danger that you may touch the pointed electrode.

### 6.3 Preparing storage

 **NOTES!** Storage:

- ▶ Dry places
- ▶ Safe against vibrations and damage

Carry out the following steps before storage:

1. Disconnect the welding turntable from the welding power supply
2. Remove the electrode.
3. Place the end caps for cooling liquid over the cooling liquid connections.
4. Store the welding turntable properly. Ensure that the hose package is not twisted or squeezed.

Carry out the following steps additionally before longer storage periods:

5. Fully remove cooling liquid from the torch hose package.
6. Clean the surfaces.
7. Lightly grease the chuck and turning plate

Further care and maintenance advice, see chap. 10, p.32

## 7. COMMISSIONING

The welding turntable consists of a drive unit, provided with a turning plate as well as a swivel unit for the rotating unit. The two function units are combined on a stable machine frame in a welded structure.

The drive unit is a DC motor, provided with a spur gear.

The tilting device is used to set the tilt of the rotating axis. For turntables of the DVR 100 the tilt adjustment is realized by means of two clamping devices and can be set continuously from 0° to 90°. The tilt for turntables of the type DVR 50 can be set continuously via the lateral clamping lever in a range of 0° to ± 90°.

Mechanical safety devices, which ward off dangerous situations caused by the rotary movement of the turntable are not included in the scope of delivery of the welding turntable.

### 7.1 Scope of delivery

SCOPE OF DELIVERY		DVR 50	DVR 50 AVC	DVR 100	DVR 100 AVC
Welding turntable of the DVR series (without lathe chuck)	PCS.	1	1	1	1
Stand	PCS.	1	1	1	1
Signal distribution box	PCS.	1	1	–	–
Machine torch with equipment	PCS.	1	1	1	1
AVC linear unit	PCS.	–	1	–	1
Operating instructions and spare part list	Set	1	1	1	1

### 7.2 Checking the scope of delivery

- ▶ Check the delivery for completeness and damage caused by transport.
- ▶ Report any missing parts or damage caused by transport to your supplier immediately.

### 7.3 Accessories (optionally available)

- Three-jaw lathe chuck\*
- Control cable (required for use with DVR welding turntables)\*
- Ground cable (required for use with DVR welding turntables)\*
- Remote control OWH BASIC
- Cold-wire feeds DVR

\* Obligatory accessories

### 7.4 Setting up



#### WARNING!

Danger of accidents through impermissible transport of devices that cannot be transported by crane!

Using a crane and suspending the device not permissible! The device may fall down and injure persons! Handles and mounts are solely suitable for transport by hand!

The device is not suitable for transporting by crane or suspension!

**CAUTION!**

Danger of accidents through tripping hazards and unsuitable setup location!  
Persons might be endangered through an incorrect setup location of the device.  
Cables or hoses packages which are not properly laid represent tripping hazards and can cause accidents.

- ▶ Set up the device in such a way that sufficient space is available to set the control elements.
- ▶ Do not block escape routes!
- ▶ Do not lay cables or hose packages in the danger zone of the device!
- ▶ Lay cables or hose packages in a straight line or bundled up (use cable ducts or other aids, if necessary)!

#### Anchoring the turntable and weld torch stand (DVR50/DVR100)

Anchor the turntable and stand through the attachment holes (01) on a suitable, stable and level substrate.



## 7.5 Clamping chuck swivel range setting

**CAUTION!**

Danger of injury when loosening the clamping lever(s) of the swivel adjustment!  
While loosening the clamping lever(s), the turntable can fold down, injure persons and cause damage.

- ▶ Switch off the power source before each position change!
- ▶ Before loosening the clamping lever(s), check the workpiece fit and fastening!
- ▶ Position changes have to be performed together with a second person!

Loosen the clamping levers one after another (DVR100) and set the swiveling position.  
Fixate the new position by tightening the clamping lever(s).

## 7.6 Preparing initial operation

- ▶ Check the hose package and lines for damage.
- ▶ Check the working environment for possible sources of danger and, if applicable, eliminate these.
- ▶ Fill the machine welding torch with cooling liquid (see chap. 8.8, page 26).
- ▶ Check the welding turntable and machine welding torch for loose parts.

## 8. SET-UP AND MOUNTING

### 8.1 Procedure



**NOTE!**

Observe the operating instructions of the ORBIMAT power source!

Carry out setting up and mounting in the following order:

1. Connect the control cable
2. Connect the ground cable
3. Set up the electrode
4. Clamp in the workpiece
5. Set up the torch
6. Carry out the gas and cooling-liquid function test
7. Connect the accessories
8. Configure the welding procedure

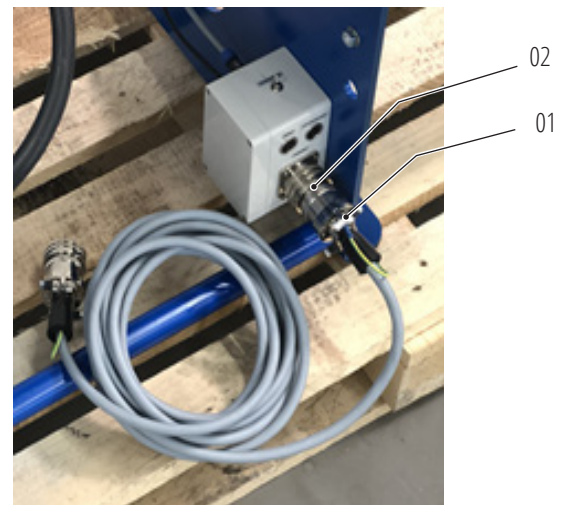
### 8.2 Connect the control cable



**WARNING!**

- ▶ Lay the control cable in such a manner that it is not under tension
- ▶ Ensure that the hose package **does not** represent a tripping hazard.

1. Insert and screw the control cable plug (01) into the control cable socket (02) of the signal distribution box. .



### 8.3 Connect the ground cable



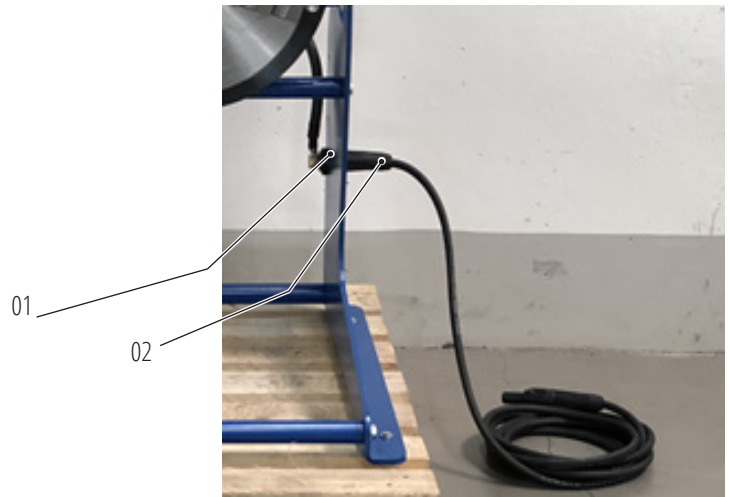
**WARNING!**

Burns through arc!

When persons trip over the ground cable, the cable socket may be pulled from the DVR ground plug and an electric arc may occur.

- ▶ Lay the ground cable in such a manner that it is not under tension.
- ▶ Ensure that the ground cable does not represent a tripping hazard

1. Insert the ground cable socket (01) on the ground plug (02) and lock by rotating.



## 8.4 Connecting the welding power supply



### WARNING!

Burns through arc!

If persons trip over the hose package, the plug could be pulled out of the welding power source and an arc may arise.

- ▶ Lay the hose package and lines in such a manner that it is not under tension.
- ▶ Ensure that the hose package and lines **do not** represent a tripping hazard.
- ▶ Attach the strain relief.



### NOTE!

Overheating of the welding torch due to lack of cooling liquid!

- ▶ Ensure that the cooling liquid vessel of the welding power supply is filled.

### 8.4.1 DVR connection scheme

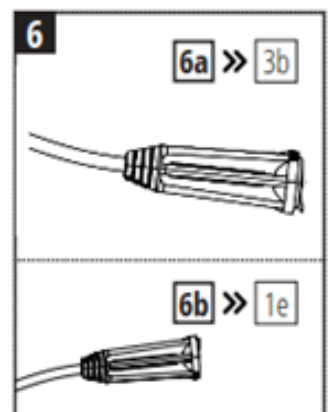
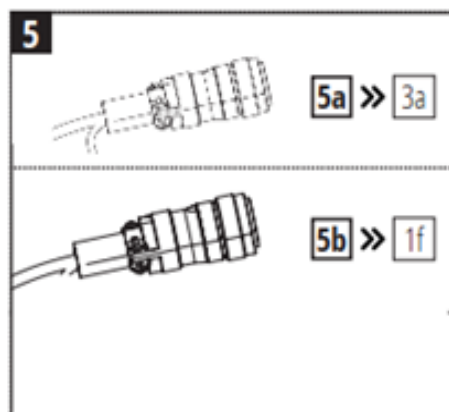
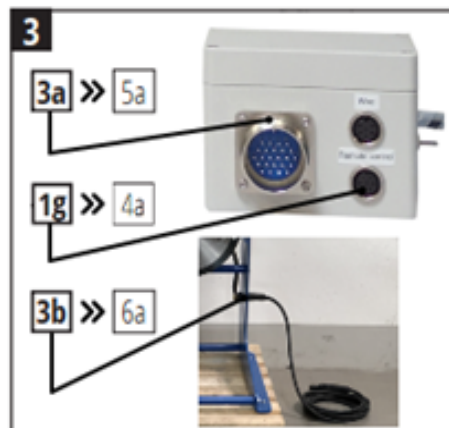
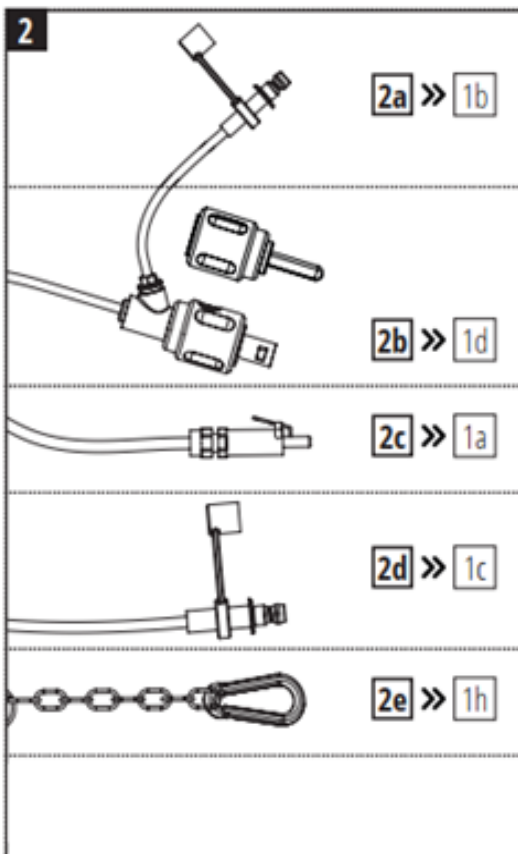
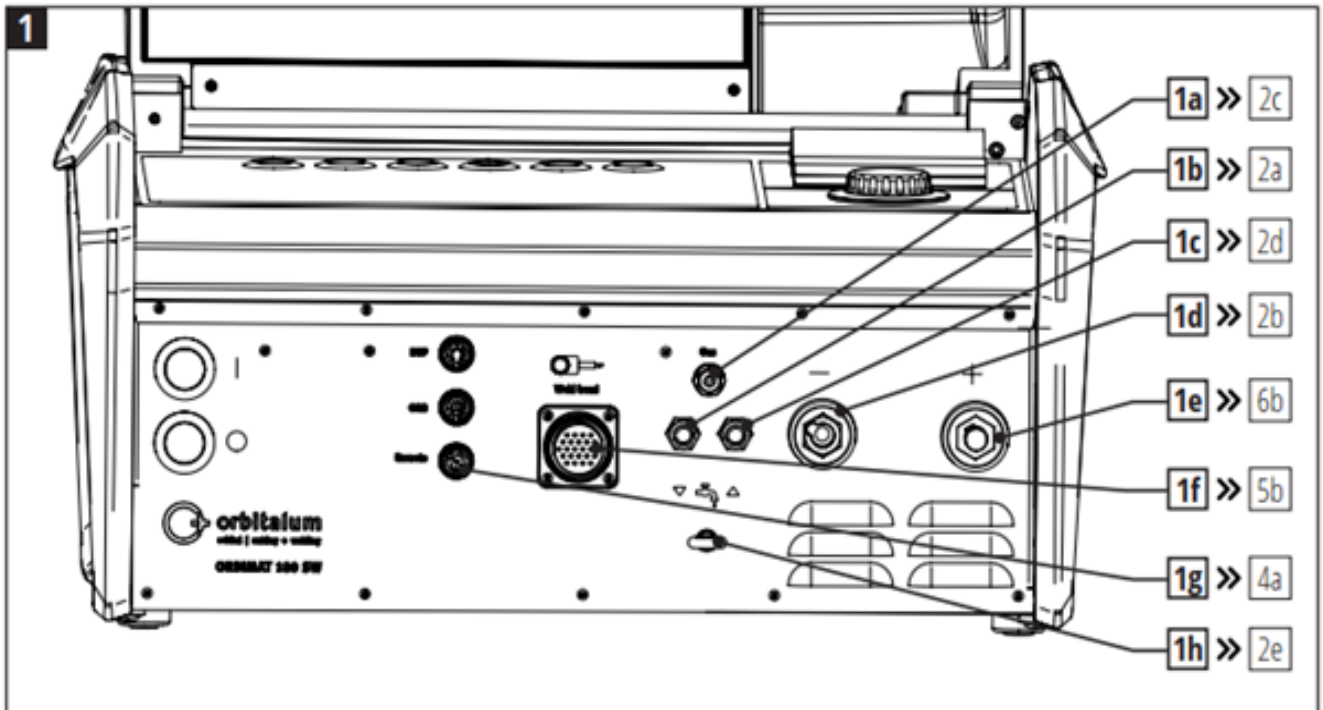
**NOTE!**

- ▶ Before connecting the welding torch and the control cable ensure that the power source is switched off.
- ▶ Remote control is not mandatory for use of the DVR (optionally available).

Carry out DVR connections in the following sequence:

1. Connect the Amphenol plug "Control line" to power source" (5b) to the "Control line" socket (1f) at the power source.
2. Connect the "Control cable" plug (5a) to the "Control cable" socket (3a) to the DVR signal connection box and screw tight.
3. If applicable, connect the "Remote control" plug (4a) to the "Remote control" socket (1g) of the DVR signal connection box.
4. Attach the "Strain relief" snap hook (2e) of the hose package to the "Strain relief" eye (1h) at the power source.
5. Connect the "Welding current –" plug (2b) of the hose package to the "Welding current –" socket (1d) at the power source and lock it with a turning movement.
6. Connect the "Gas" plug (2c) of the hose package to the "Gas" socket (1a) at the power source.
7. Connect the "Cooling liquid return line" plug, red (2d) of the hose package to the "Cooling liquid supply line" socket, red (1c) at the power source.
8. Connect the "Cooling liquid supply line" plug, blue (2a) of the hose package to the "Cooling liquid supply line" socket, blue (1b) at the power source.
9. Connect the "Ground cable" plug (6b) of the ground cable to the "Welding current" "+" socket (1e) at the power source and screw hand-tight.
10. Connect the "Ground cable" socket (6a) from the ground cable connector of the DVR (3b). Ensure good electrical contact.
11. Switch on the welding power supply.
12. Carry out a gas and cooling liquid function test (see chap.8.7 p. 25). If necessary, top up the cooling liquid.





## 8.5 Torch arm position setting

**CAUTION!**

Danger of injury and of damage through inserted chuck key!

- ▶ Check whether the chuck key has been removed from chuck lock before each welding and moving of the lathe chuck.

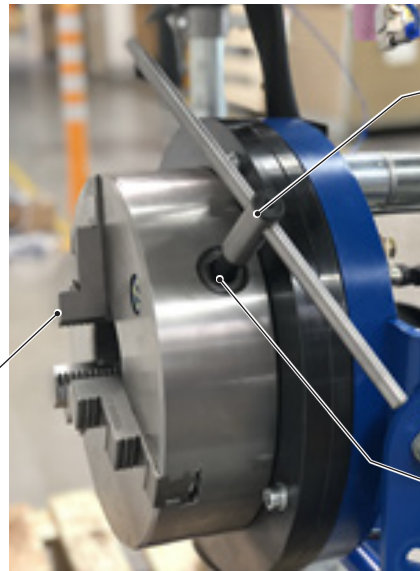
**NOTE!**

Prerequisite:

- ▶ Pipe ends are tacked together light-/gap-free. If necessary, carry out with seam preparation beforehand.

1. Insert the chuck key (01) into the chuck lock (02) of the lathe chuck and set roughly to the current pipe diameter of the workpiece by rotating the clamping jaws (03).
2. Insert the workpiece into the chuck and tighten with the inserted chuck key.

03



01

02

**NOTE!**

Adjust the clamping power to the wall thickness of the workpiece to avoid deformation or damage at the workpiece.

## 8.6 Torch arm position setting

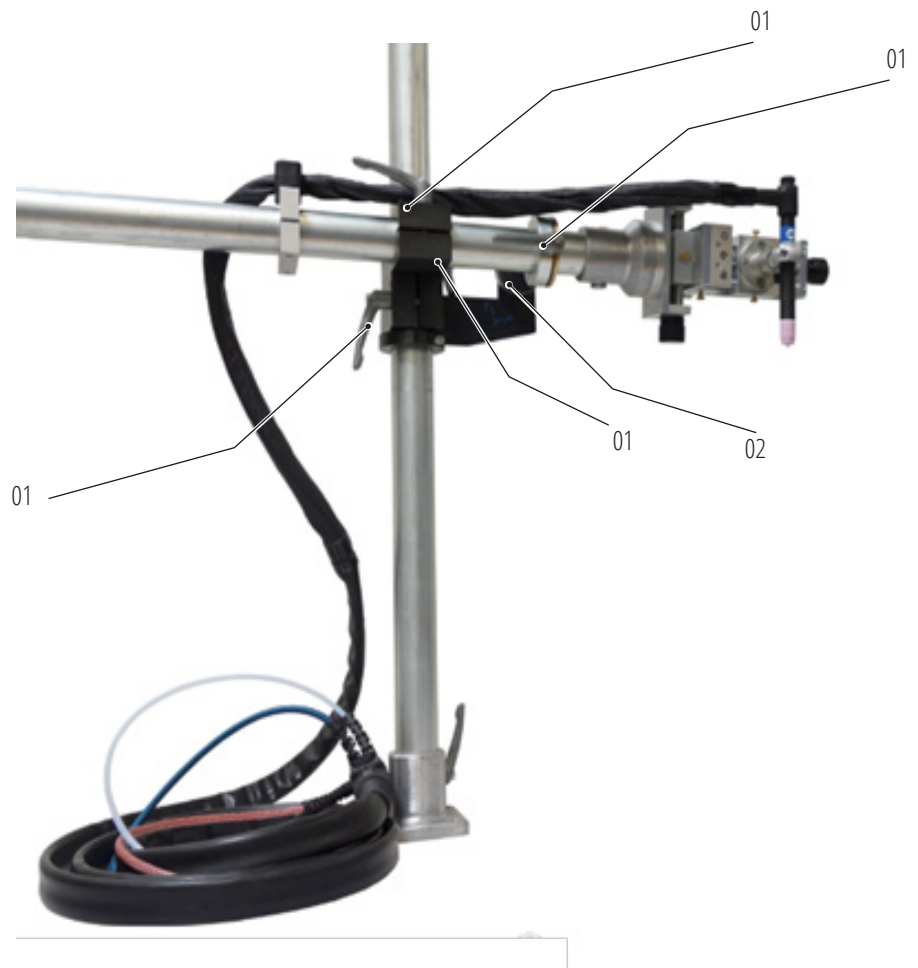
- ⚠ CAUTION!** Danger of injury by loosening the clamping lever(s) of the stand clamping blocks!  
While loosening the clamping lever(s), the torch arm can drop, injure persons and cause damage.
- ▶ Switch off the power source before each position change!
  - ▶ Check the safety clamp for firm seating before loosening the clamping lever.
  - ▶ High position changes must be carried out together with a second person!

- ⚠ CAUTION!**
- ▶ Risk of crushing through magnet position limit stop.
  - ▶ When swiveling the torch arm, do not grasp between the stop magnets.
  - ▶ When setting up the magnetic stop, do not grasp between the stop magnets.

Loosen the clamping lever (o1) by pressing and simultaneously turning clockwise and set the desired torch arm position.

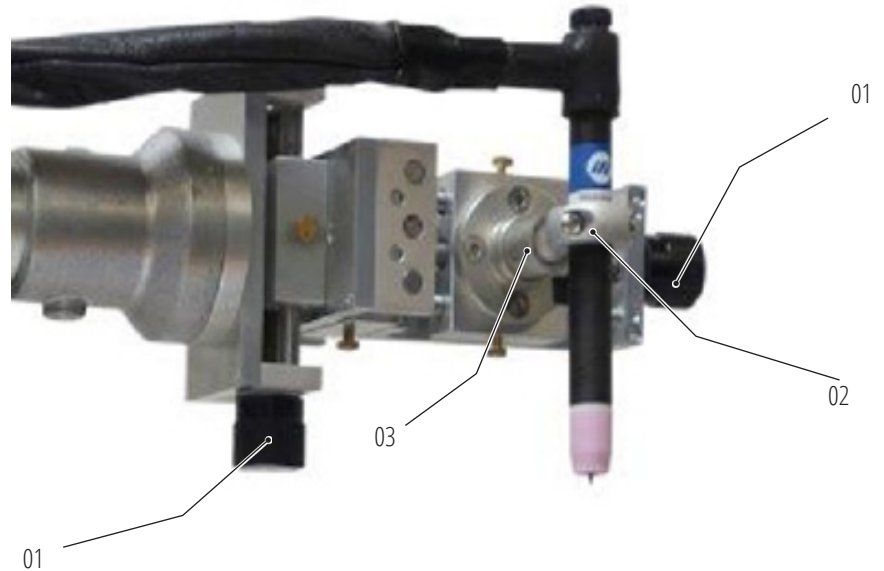
Fixate the new position by pressing again and simultaneously turning clockwise.

Set the desired end stop position by aligning the stop magnet (o2) and fixate.



## 8.7 Torch fine setting

The torch position can be fine adjusted in the X and Y direction by rotating the adjustment knobs (o1) of the compound slide. By loosening the adjustment screw (o2) at the ball head (o3) of the torch holder, the torch can be adjusted in all directions by swiveling.



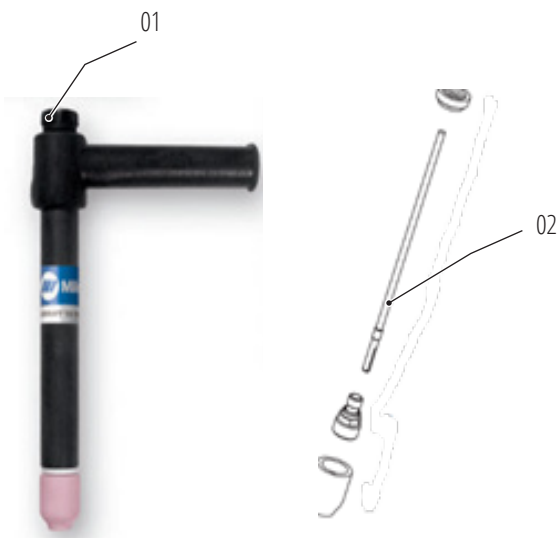
## 8.8 Setting up the torch



**NOTE!**

Regularly check the gas nozzle (xx), gas line (xx) and gasket (xx) for impurities and damage and replace, if necessary.

1. Open the torch cover (o1)
2. Insert the electrode into the clamping sleeve (o2)
3. Screw in the torch cover again. Fine-adjust the electrode protrusion from the gas nozzle, if necessary



## 8.9 Carry out the gas and cooling-liquid function test

**NOTE!**

Before carrying out the gas and cooling liquid function test ensure:

- ▶ The gas supply must be connected to the power source and be opened.
- ▶ The cooling liquid tank at the power source must be filled sufficiently.
- ▶ The cooling liquid level drops in case of initial operation or an unfilled hose package. Cooling liquid must be topped up, if necessary (see below)

**NOTE!**

With a connected remote control (optionally available) the function test can also be performed by actuating the gas key at the remote control (instead of the Softkey 2 at the power source, see below).

1. Set the Orbital weld power source into test mode by pressing Softkey 2 "Test" or by pressing the corresponding key at the touch screen.
2. Press Softkey 2 again to access the submenu "Gas cooling liquid".
3. Press Softkey 2 again to activate the gas cooling liquid circuit and start the gas and cooling liquid function test.
4. During initial commissioning or unfilled welding tongs: Wait 1 minute until the hose package has filled with cooling liquid.
5. Press Softkey 2 to terminate the gas and cooling liquid function test

## 8.10 Calibrate the welding turntable

If several turntables of the same type are in use, Orbitalum Tools recommends that the motors be calibrated before use or in case of initial operation. Calibration of the motors ensures that saved programs on all the weld turntables produce the same result.

- ▶ Calibrate the turntable drive in accordance with the ORBIMAT operating instructions.

## 8.11 Configure the welding procedure

- ▶ Configure the welding procedure in accordance with the operating instructions of the welding power supply.

The welding turntable is ready to use.

## 9. REMOTE CONTROL (OPTIONALLY AVAILABLE)





### 9.1 Operating elements



ELEMENT	FUNCTION
<b>LED</b>	LED flashes in ready-to-weld state.
	LED lights up constantly during the welding process.
<b>START STOP</b>	Starts the welding process.
	<ul style="list-style-type: none"> <li>Pressing once: Welding process aborts immediately, rotation movement is stopped and the gas post purge time is activated.</li> <li>Pressing again: Gas post purge time and cooling are stopped.</li> </ul>
<b>ROTATION</b>	Pressing briefly: Turntable rotates step-by-step (clockwise) in the welding direction.
	Pressing and holding: Turntable rotates continuously (clockwise) in the welding direction.
<b>WIRE FORWARD (function only for KD version)</b>	Pressing briefly: Wire is transported step-by-step (in feed direction).
	Pressing and holding: Rotor turns continuously (in feed direction).
<b>WIRE BACK (function only for KD version)</b>	Pressing briefly: Wire is supplied step-by-step (against feed direction).
	Pressing and holding: Rotor rotates continuously (against feed direction).

## 9.2 Welding

Prerequisite: Welding power supply connected and ready to operate.

 <b>WARNING!</b>	UV and infrared radiation arises during the welding process. <ul style="list-style-type: none"> <li>▶ To protect the operator against this radiation</li> <li>▶ Wear eye protection according to EN170.</li> <li>▶ Immediately replace defective swivel clamps or swivel clamps that do not fit exactly.</li> </ul>
 <b>DANGER!</b>	Electromagnetic fields arise during the welding process. <ul style="list-style-type: none"> <li>▶ The plant operator must realize the workplaces in accordance with the EMF Directive 2013/35/EU in such a manner that do danger whatsoever exists for the operator or persons in the vicinity of the welding system.</li> </ul>
 <b>DANGER!</b>	If the argon share in the air rises above 50%, lasting damage or risk of death can arise through suffocation. <ul style="list-style-type: none"> <li>▶ Ensure sufficient ventilation in rooms.</li> <li>▶ If necessary, monitor the oxygen level in the air.</li> </ul>
 <b>WARNING!</b>	Thermal problems can arise in the case of incorrect positioning of the forming system or the use of impermissible materials in the welding area. In the worst case a fire will be started. <ul style="list-style-type: none"> <li>▶ Observe the local general fire protection measures.</li> </ul>

1. Press the **START key of the power source or remote control (optional)** to start the welding process.
2. Observe the welding process.

The welding process ends automatically after the gas post purge time has expired.

## 9.3 Aborting welding

Danger of burning at the workpiece and in the welding zone of the welding tongs!

- ▶ Read the operating instructions of the Orbital welding power source.
- ▶ Press the red "STOP" key of the power source or remote control (optional). This stops the running process. Only the programmed gas post purge time and cooling continue to run.

## 10. SERVICING AND MAINTENANCE



**NOTE!**

The system has to be secured against unintentional switching-on for all maintenance, repair and mounting work. This can take place by switching off the main switch at the switch box and pulling the power plug.

The turntable is generally designed to be maintenance-free. The weld current transfer of the turntable to the base frame takes place via a ground pin. This is installed with a copper paste (OKS 240) during mounting. In case of high soiling of the system this stud should be cleaned every six months and the contact surface should be re-greased with copper paste. All installed rolling bearings are sealed and lubricated for the entire service life.

### 10.1 Instructions for care

- ▶ Ensure that **no** dirt particles or small parts enter the turntable gearing.
- ▶ If the surfaces are soiled, use only residue-free cleaning agents for cleaning.

### 10.2 Maintenance and care

#### 10.2.1 Corrosion protection

Regularly apply a fine thin oil film, for example, using an oil-drenched cloth to the surfaces of the turntable and chuck.

Recommended oils:

- BALLISTOL corrosion protection oil
- NEOVAL Oil MTO300
- WD40

#### 10.2.2 Lubrication

Track and tothing must be lubricated regularly:

- After installation
- After each cleaning of the tothing
- Before and after long standstill times.

#### 10.2.3 Lubrication of the track

- Use the same lubricant if possible when relubricating
- Clean grease nipples before greasing
- Rotate the bearing slowly during the lubrication procedure
- Refill grease until a fresh grease collar forms at the bearing gaps or seals.

**Lubricants for track and tothing:**

SUPPLIER	TRACK SYSTEM	TOOTHING
LUBCON	TURMOPLEX 2EP	GRIZZLYGREASE No.1
ARAL	Aralub HLP2	Aralub LFZ1
BP	Energrease LS - EP2	Energol WRL/GR 154 GS
CASTROL	Grease LMX	
ELF	Epexa 2	



Epexelf 2	Cardexa DC1	
ESSO	Beacon EP2	Surret Fluid NX
MOBIL	Mobilux EP2	Mobiltac 81
SHELL	Calithia EP2	Malléus Fluid D

#### 10.2.4 Lubrication intervals

The following instructions for care depend, if not stated otherwise, strongly on the usage of the welding turntable. Shorter cleaning intervals influence the equipment service life positively.

INTERVAL	ACTIVITY
Every 100 - 200 operating hours	<ul style="list-style-type: none"> <li>▶ <b>Manual lubrication:</b> Ball bearing. Shorter lubrication intervals are required for aggressive and highly contaminated environments, strong temperature changes and continuous rotary movement.</li> <li>▶ <b>With automatic lubrication:</b> 1 g grease per operating hour and lubrication point.</li> </ul>
After 100 operating hours or every 500 operating hours (at least 2 per year)	<ul style="list-style-type: none"> <li>▶ Checking the fastening screws.</li> </ul>
After installation without load or after 1000 operating hours (at least once per year without load)	<ul style="list-style-type: none"> <li>▶ Checking the track (bearing play check). If the bearing play is twice the size of the play during the reference measurement, the bearing must be exchanged.</li> </ul>

#### 10.2.5 Standard cleaning process of the weld turntable



##### NOTE!

- ▶ Cleaning work on the welding turntable may only be carried out after it has cooled down completely!
- ▶ The welding turntable must **not** be cleaned with a high-pressure cleaner!
- ▶ Cleaning of the weld turntable should be carried out at least every 250 welding processes. A shorter cleaning interval influences the service life of the weld turntable positively.

Required cleaning materials:

- Compressed-air vacuum unit or vacuum cleaner
- Nylon brush
- Scotch-Brite 3M A-VFN 150x115 mm (or similar product)
- Industrial cleaner spray (e.g. WEICOM spray cleaner S)

1. Spray the lathe chuck and turntable with industrial cleaner.
2. Subsequently remove rough soiling from the lathe chuck and turning plate inside with a nylon brush.
3. Vacuuming and wiping off the carbon-like deposits by using a compressed-air vacuum unit or vacuum cleaner and cloth.
4. Fine cleaning of the turntable and chuck with Scotch-Brite nonwoven
5. Vacuuming and wiping off the carbon-like deposits by using a compressed-air vacuum unit or vacuum cleaner and cloth.
6. Circumferentially spray the turntable and chuck with contact cleaner again.
7. Subsequently wipe off all surfaces with a cloth. Let the cleaning agent evaporate completely before carrying out the next step.
8. Sprinkle BALLISTOL corrosion protection oil onto the cloth again. Use the cloth to apply an extremely thin oil film on the turntable and the chuck surfaces

### 10.3 Servicing/Customer service

The following data are required to order spare parts:

- Machine model: (example: DVR 50)
  - Machine No.: See type plate
- ▶ For ordering spare parts, see the separate spare part list.
- ▶ Contact your local branch directly in order to eliminate problematic situations.



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