Operating instructions

EN

Wire feed unit

# drive 4 IC Basic

099-005416-EW501 | Observe additional system documents! | 01.12.2015

# General instructions

**CAUTION**

**Read the operating instructions!**
**The operating instructions provide an introduction to the safe use of the products.**

- Read the operating instructions for all system components!
- Observe accident prevention regulations!
- Observe all local regulations!
- Confirm with a signature where appropriate.

☞ ***In the event of queries on installation, commissioning, operation or special conditions at the installation site, or on usage, please contact your sales partner or our customer service department on +49 2680 181-0.***
***A list of authorised sales partners can be found at www.ewm-group.com.***

Liability relating to the operation of this equipment is restricted solely to the function of the equipment. No other form of liability, regardless of type, shall be accepted. This exclusion of liability shall be deemed accepted by the user on commissioning the equipment.

The manufacturer is unable to monitor whether or not these instructions or the conditions and methods are observed during installation, operation, usage and maintenance of the equipment.
An incorrectly performed installation can result in material damage and injure persons as a result. For this reason, we do not accept any responsibility or liability for losses, damages or costs arising from incorrect installation, improper operation or incorrect usage and maintenance or any actions connected to this in any way.

# 1 Contents

# 2 Safety instructions

## 2.1 Notes on the use of these operating instructions

**DANGER**

**Working or operating procedures which must be closely observed to prevent imminent serious and even fatal injuries.**

- Safety notes include the "DANGER" keyword in the heading with a general warning symbol.
- The hazard is also highlighted using a symbol on the edge of the page.

**WARNING**

**Working or operating procedures which must be closely observed to prevent serious and even fatal injuries.**

- Safety notes include the "WARNING" keyword in the heading with a general warning symbol.
- The hazard is also highlighted using a symbol in the page margin.

**CAUTION**

**Working or operating procedures which must be closely observed to prevent possible minor personal injury.**

- The safety information includes the "CAUTION" keyword in its heading with a general warning symbol.
- The risk is explained using a symbol on the edge of the page.

**CAUTION**

**Working and operating procedures which must be followed precisely to avoid damaging or destroying the product.**

- The safety information includes the "CAUTION" keyword in its heading without a general warning symbol.
- The hazard is explained using a symbol at the edge of the page.

☞ ***Special technical points which users must observe.***

Instructions and lists detailing step-by-step actions for given situations can be recognised via bullet points, e.g.:

- Insert the welding current lead socket into the relevant socket and lock.

## 2.2 Explanation of icons

| Symbol | Description |
|---|---|
|  | Special technical points which users must observe. |
|  | Correct |
|  | Wrong |
|  | Press |
|  | Do not press |
|  | Press and keep pressed |
|  | Turn |
|  | Switch |
|  | Switch off machine |
|  | Switch on machine |
| ENTER | enter the menu |
| NAVIGATION | Navigating in the menu |
| EXIT | Exit the menu |
|   | Time display (example: wait 4s/press) |
|  | Interruption in the menu display (other setting options possible) |
|  | Tool not required/do not use |
|  | Tool required/use |

## 2.3 General

**DANGER**

**Electromagnetic fields!**
**The power source may cause electrical or electromagnetic fields to be produced which could affect the correct functioning of electronic equipment such as IT or CNC devices, telecommunication lines, power cables, signal lines and pacemakers.**

- Observe the maintenance instructions - See 6 Maintenance, care and disposal chapter!
- Unwind welding leads completely!
- Shield devices or equipment sensitive to radiation accordingly!
- The correct functioning of pacemakers may be affected (obtain advice from a doctor if necessary).

**Do not carry out any unauthorised repairs or modifications!**
**To avoid injury and equipment damage, the unit must only be repaired or modified by specialist, skilled persons!**
**The warranty becomes null and void in the event of unauthorised interference.**

- Appoint only skilled persons for repair work (trained service personnel)!

**Electric shock!**
**Welding machines use high voltages which can result in potentially fatal electric shocks and burns on contact. Even low voltages can cause you to get a shock and lead to accidents.**

- Do not touch any live parts in or on the machine!
- Connection cables and leads must be free of faults!
- Switching off alone is not sufficient!
- Place welding torch and stick electrode holder on an insulated surface!
- The unit should only be opened by specialist staff after the mains plug has been unplugged!
- Only wear dry protective clothing!
- Wait for 4 minutes until the capacitors have discharged!

**WARNING**

**Validity of the document!**
**This document is valid only in combination with the operating instructions for the product being used!**

- Read and observe the operating instructions for all system components, especially the safety instructions!

**Risk of accidents due to non-compliance with the safety instructions!**
**Non-compliance with the safety instructions can be fatal!**

- Carefully read the safety instructions in this manual!
- Observe the accident prevention regulations and any regional regulations!
- Inform persons in the working area that they must comply with the regulations!

**Explosion risk!**
**Apparently harmless substances in closed containers may generate excessive pressure when heated.**

- Move containers with inflammable or explosive liquids away from the working area!
- Never heat explosive liquids, dusts or gases by welding or cutting!

## ⚠ WARNING

**Risk of injury due to radiation or heat!**
**Arc radiation results in injury to skin and eyes.**
**Contact with hot workpieces and sparks results in burns.**

- Use welding shield or welding helmet with the appropriate safety level (depending on the application)!
- Wear dry protective clothing (e.g. welding shield, gloves, etc.) according to the relevant regulations in the country in question!
- Protect persons not involved in the work against arc beams and the risk of glare using safety curtains!

**Smoke and gases!**
**Smoke and gases can lead to breathing difficulties and poisoning. In addition, solvent vapour (chlorinated hydrocarbon) may be converted into poisonous phosgene due to the ultraviolet radiation of the arc!**

- Ensure that there is sufficient fresh air!
- Keep solvent vapour away from the arc beam field!
- Wear suitable breathing apparatus if appropriate!

**Fire hazard!**
**Flames may arise as a result of the high temperatures, stray sparks, glowing-hot parts and hot slag produced during the welding process.**
**Stray welding currents can also result in flames forming!**

- Check for fire hazards in the working area!
- Do not carry any easily flammable objects such as matches or lighters.
- Keep appropriate fire extinguishing equipment to hand in the working area!
- Thoroughly remove any residue of flammable substances from the workpiece before starting welding.
- Only continue work on welded workpieces once they have cooled down.
  Do not allow to come into contact with flammable material!
- Connect welding leads correctly!

**Danger when coupling multiple power sources!**
**Coupling multiple power sources in parallel or in series has to be carried out by qualified personnel and in accordance with the manufacturer's guidelines. Before bringing the power sources into service for arc welding operations, a test has to verify that they cannot exceed the maximum allowed open circuit voltage.**

- Connection of the machine may be carried out by qualified personnel only!
- When decommissioning individual power sources, all mains and welding current leads have to be safely disconnected from the welding system as a whole. (Danger due to inverse voltages!)
- Do not couple welding machines with pole reversing switch (PWS series) or machines for AC welding, as a minor error in operation can cause the welding voltages to be combined.

## ⚠ CAUTION

**Noise exposure!**
**Noise exceeding 70 dBA can cause permanent hearing damage!**

- Wear suitable ear protection!
- Persons located within the working area must wear suitable ear protection!

**CAUTION**

**Obligations of the operator!**
**The respective national directives and laws must be observed for operation of the machine!**

- National implementation of the framework directive (89/391/EWG), as well as the associated individual directives.
- In particular, directive (89/655/EWG), on the minimum regulations for safety and health protection when staff members use equipment during work.
- The regulations regarding work safety and accident prevention for the respective country.
- Setting up and operating the machine according to IEC 60974-9.
- Check at regular intervals that users are working in a safety-conscious way.
- Regular checks of the machine according to IEC 60974-4.

**Damage due to the use of non-genuine parts!**
**The manufacturer's warranty becomes void if non-genuine parts are used!**

- Only use system components and options (power sources, welding torches, electrode holders, remote controls, spare parts and replacement parts, etc.) from our range of products!
- Only insert and lock accessory components into the relevant connection socket when the machine is switched off.

**Damage to the machine due to stray welding currents!**
**Stray welding currents can destroy protective earth conductors, damage equipment and electronic devices and cause overheating of components leading to fire.**

- Make sure all welding leads are securely connected and check regularly.
- Always ensure a proper and secure electrical connection to the workpiece!
- Set up, attach or suspend all conductive power source components like casing, transport vehicle and crane frames so they are insulated!
- Do not place any other electronic devices such as drillers or angle grinders, etc., on the power source, transport vehicle or crane frames unless they are insulated!
- Always put welding torches and electrode holders on an insulated surface when they are not in use!

**Mains connection**
**Requirements for connection to the public mains network**

High-performance machines can influence the mains quality by taking current from the mains network. For some types of machines, connection restrictions or requirements relating to the maximum possible line impedance or the necessary minimum supply capacity at the interface with the public network (Point of Common Coupling, PCC) can therefore apply. In this respect, attention is also drawn to the machines' technical data. In this case, it is the responsibility of the operator, where necessary in consultation with the mains network operator, to ensure that the machine can be connected.

**CAUTION**

**EMC Machine Classification**

**In accordance with IEC 60974-10, welding machines are grouped in two electromagnetic compatibility classes - See 8 Technical data chapter:**

**Class A** machines are not intended for use in residential areas where the power supply comes from the low-voltage public mains network. When ensuring the electromagnetic compatibility of class A machines, difficulties can arise in these areas due to interference not only in the supply lines but also in the form of radiated interference.

**Class B** machines fulfil the EMC requirements in industrial as well as residential areas, including residential areas connected to the low-voltage public mains network.

**Setting up and operating**

When operating arc welding systems, in some cases, electro-magnetic interference can occur although all of the welding machines comply with the emission limits specified in the standard. The user is responsible for any interference caused by welding.

In order to **evaluate** any possible problems with electromagnetic compatibility in the surrounding area, the user must consider the following: (see also EN 60974-10 Appendix A)

- Mains, control, signal and telecommunication lines
- Radios and televisions
- Computers and other control systems
- Safety equipment
- The health of neighbouring persons, especially if they have a pacemaker or wear a hearing aid
- Calibration and measuring equipment
- The immunity to interference of other equipment in the surrounding area
- The time of day at which the welding work must be carried out

Recommendations for **reducing interference emission**

- Mains connection, e.g. additional mains filter or shielding with a metal tube
- Maintenance of the arc welding equipment
- Welding leads should be as short as possible and run closely together along the ground
- Potential equalization
- Earthing of the workpiece. In cases where it is not possible to earth the workpiece directly, it should be connected by means of suitable capacitors.
- Shielding from other equipment in the surrounding area or the entire welding system

## 2.4 Transport and installation

**WARNING**

**Incorrect handling of shielding gas cylinders!**
**Incorrect handling of shielding gas cylinders can result in serious and even fatal injury.**

- Observe the instructions from the gas manufacturer and in any relevant regulations concerning the use of compressed air!
- Place shielding gas cylinders in the holders provided for them and secure with fixing devices.
- Avoid heating the shielding gas cylinder!

**Risk of accident due to improper transport of machines that may not be lifted!**
**Do not lift or suspend the machine! The machine can fall down and cause injuries! The handles and brackets are suitable for transport by hand only!**

- The machine may not be lifted by crane or suspended!

**CAUTION**

**Risk of tipping!**
**There is a risk of the machine tipping over and injuring persons or being damaged itself during movement and set up. Tilt resistance is guaranteed up to an angle of 10° (according to IEC 60974-1).**

- Set up and transport the machine on level, solid ground.
- Secure add-on parts using suitable equipment.

**Damage due to supply lines not being disconnected!**
**During transport, supply lines which have not been disconnected (mains supply leads, control leads, etc.) may cause hazards such as connected equipment tipping over and injuring persons!**

- Disconnect supply lines!

**CAUTION**

**Equipment damage when not operated in an upright position!**
**The units are designed for operation in an upright position!**
**Operation in non-permissible positions can cause equipment damage.**

- Only transport and operate in an upright position!

## 2.4.1 Ambient conditions

**CAUTION**

**Installation site!**

**The machine must not be operated in the open air and must only be set up and operated on a suitable, stable and level base!**

- The operator must ensure that the ground is non-slip and level, and provide sufficient lighting for the place of work.
- Safe operation of the machine must be guaranteed at all times.

**CAUTION**

**Equipment damage due to dirt accumulation!**

**Unusually high quantities of dust, acid, corrosive gases or substances may damage the equipment.**

- Avoid high volumes of smoke, vapour, oil vapour and grinding dust!
- Avoid ambient air containing salt (sea air)!

**Non-permissible ambient conditions!**

**Insufficient ventilation results in a reduction in performance and equipment damage.**

- Observe the ambient conditions!
- Keep the cooling air inlet and outlet clear!
- Observe the minimum distance of 0.5 m from obstacles!

### 2.4.1.1 In operation

**Temperature range of the ambient air:**

- -25 °C to +40 °C

**Relative air humidity:**

- Up to 50% at 40 °C
- Up to 90% at 20 °C

### 2.4.1.2 Transport and storage

**Storage in an enclosed space, temperature range of the ambient air:**

- -30 °C to +70 °C

**Relative air humidity**

- Up to 90% at 20 °C

# 3 Intended use

**WARNING**

**Hazards due to improper usage!**
**Hazards may arise for persons, animals and material objects if the equipment is not used correctly. No liability is accepted for any damages arising from improper usage!**

- The equipment must only be used in line with proper usage and by trained or expert staff!
- Do not modify or convert the equipment improperly!

## 3.1 Applications

### 3.1.1 MIG/MAG standard welding

Metal arc welding using a wire electrode, where the arc and the weld pool are shielded from the atmosphere with inert (MIG) or active (MAG) gasses or gas mixtures.

### 3.1.2 MMA welding

Manual arc welding or, for short, MMA welding. It is characterised by the fact that the arc burns between a melting electrode and the molten pool. There is no external protection; any protection against the atmosphere comes from the electrode.

#### 3.1.2.1 Air arc gouging

During gouging, an arc burns between a carbon electrode and the workpiece, heating the workpiece until it is molten. At the same time, the molten metal is blown out with compressed air. Special electrode holders with a compressed-air connection and carbon electrodes are required for gouging.

## 3.2 Use and operation solely with the following machines

☞ ***A suitable power source (system component) is required in order to operate the wire feed unit!***

| Taurus | 355, 405, 505 Basic<br>351, 401, 451, 551 Basic |
|---|---|
| **Basic drive 200C** | ☑ |
| **Basic drive 300C** | ☑ |
| **Basic drive 4L** | ☑ |
| **Basic drive 4** | ☑ |
| **drive 4 Basic** | ☑ |
| **drive 4 IC Basic** | ☑ |
| **drive 4 Basic MMA** | ☑ |

## 3.3 Documents which also apply

### 3.3.1 Warranty

☞ ***For more information refer to the "Warranty registration" brochure supplied and our information regarding warranty, maintenance and testing at www.ewm-group.com!***

### 3.3.2 Declaration of Conformity

**The designated machine conforms to EC Directives and standards in terms of its design and construction:**

- EC Low Voltage Directive (2006/95/EC),
- EC EMC Directive (2004/108/EC),

This declaration shall become null and void in the event of unauthorised modifications, improperly conducted repairs, non-observance of the deadlines for the repetition test and / or non-permitted conversion work not specifically authorised by the manufacturer.
The original copy of the declaration of conformity is enclosed with the unit.

### 3.3.3 Welding in environments with increased electrical hazards

**In compliance with IEC / DIN EN 60974, VDE 0544 the machines can be used in environments with an increased electrical hazard.**

### 3.3.4 Service documents (spare parts and circuit diagrams)

**DANGER**

**Do not carry out any unauthorised repairs or modifications!**
**To avoid injury and equipment damage, the unit must only be repaired or modified by specialist, skilled persons!**
**The warranty becomes null and void in the event of unauthorised interference.**

- Appoint only skilled persons for repair work (trained service personnel)!

Original copies of the circuit diagrams are enclosed with the unit.

Spare parts can be obtained from the relevant authorised dealer.

### 3.3.5 Calibration/Validation

We hereby confirm that this machine has been tested using calibrated measuring equipment, as stipulated in IEC/EN 60974, ISO/EN 17662, EN 50504, and complies with the admissible tolerances.
Recommended calibration interval: 12 months

# 4 Machine description – quick overview

## 4.1 Front view

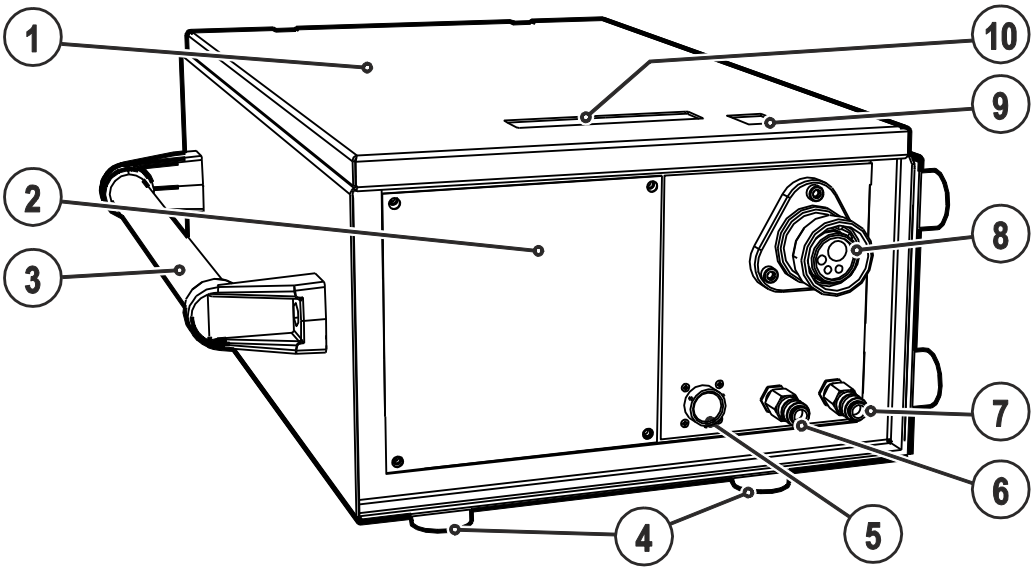



*Figure 4-1*

| Item | Symbol | Description |
|---|---|---|
| 1 | | **Protective cap**<br>Cover for the wire feed mechanism and other operating elements.<br>Depending on the machine series, additional stickers with information on the replacement parts will be located on the inside. |
| 2 | | **Machine control- See 4.3 Machine control – Operating elements chapter** |
| 3 | | **Carrying handle** |
| 4 | | **Machine feet** |
| 5 |  | **19-pole connection socket (analogue)**<br>For connecting analogue accessory components (remote control, welding torch control lead, etc.) |
| 6 |  | **Quick connect coupling (blue)**<br>coolant supply |
| 7 |  | **Quick connect coupling (red)**<br>coolant return |
| 8 | | **Welding torch connection (Euro or Dinse torch connector)**<br>Welding current, shielding gas and torch trigger integrated |
| 9 | | **Slide latch, lock for the protective cap** |
| 10 | | **Griffmulde zum Öffnen der Schutzklappe** |

## 4.2 Inside view

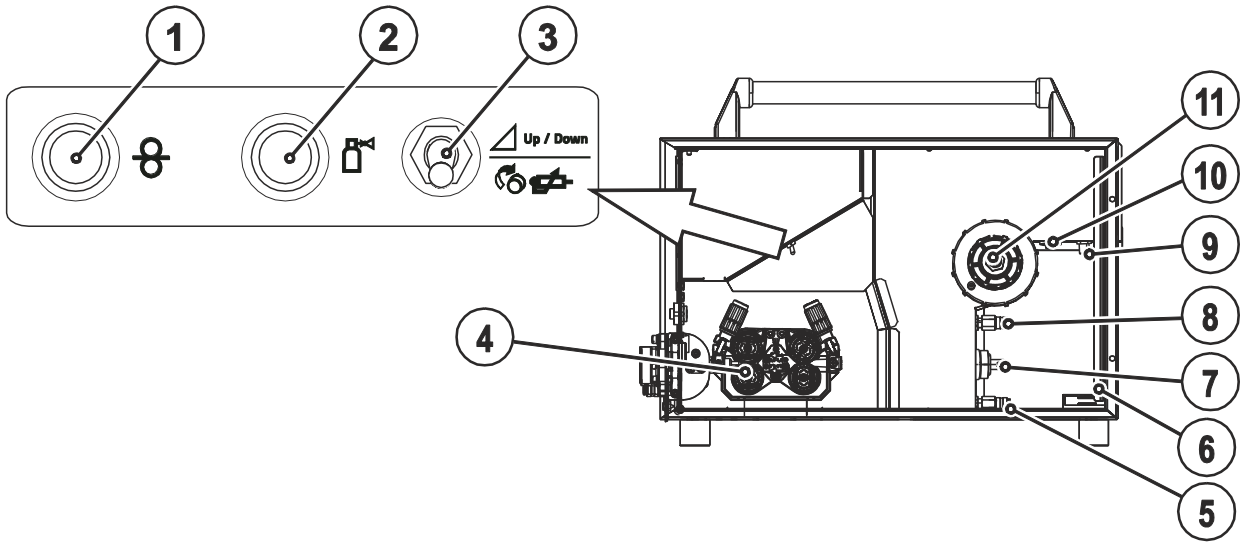



*Figure 4-2*

| Item | Symbol | Description |
|---|---|---|
| 1 | | **Button, Wire inching**<br>For inching the wire electrode when changing the wire spool (speed = 50% of set wire speed)<br>The welding wire is inched into the tube package with the current off and without the gas being expelled. |
| 2 | | **Gas test push-button**<br>The welding voltage and wire feed motor remain off while testing and setting the gas flow volume. This provides a high degree of safety for the welder, since the arc cannot be inadvertently ignited. Shielding gas flows only as long as the button is held. |
| 3 | | **Changeover switch for machine operation (operating point)**<br>The operating point (wire speed/welding voltage) can be set at the wire feed unit control, with a remote control or using an up/down welding torch.<br>Up / Down Set operating point with up/down welding torch.<br>Set operating point at the wire feed unit control or remote control (standard). |
| 4 | | **Wire feed unit** |
| 5 | | **Quick connect coupling (red)**<br>coolant return |
| 6 | | **Strain relief** |
| 7 | | **Connector plug, welding current "+"**<br>Welding current connection |
| 8 | | **Quick connect coupling (blue)**<br>coolant supply |
| 9 | | **Connecting nipple G¼, shielding gas connection** |
| 10 | | **19-pole connection socket (analogue)**<br>Wire feed unit control lead connection |
| 11 | | **Wire spool holder** |

## 4.3 Machine control – Operating elements

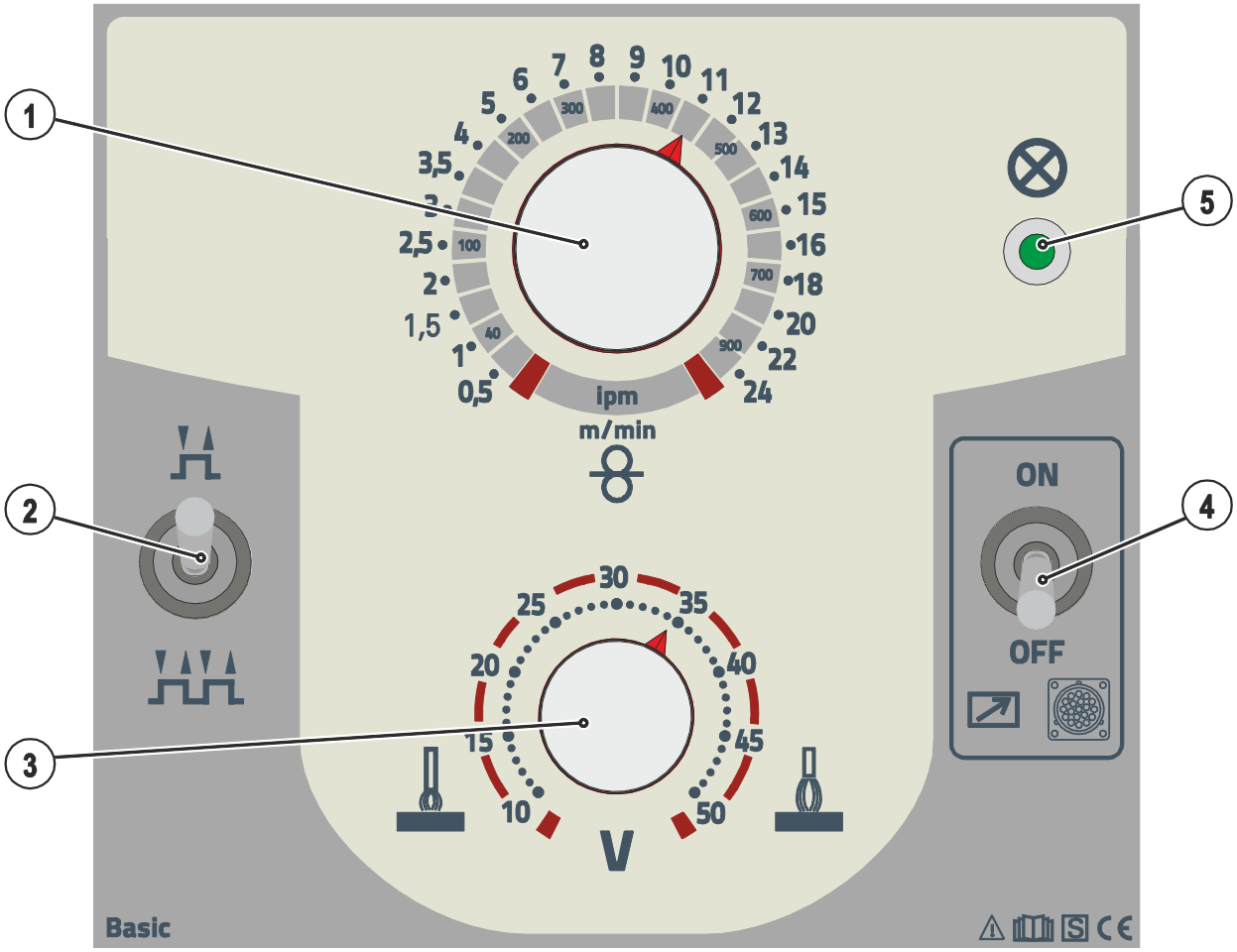
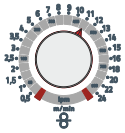
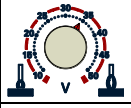



*Figure 4-3*

| Item | Symbol | Description |
|---|---|---|
| 1 |  | **Rotary dial, wire speed**<br>Wire speed setting |
| 2 |  | **Operating mode changeover switch**<br>Switching between non-latched and latched operating modes<br>Non-latched operation<br>Latched operation |
| 3 |  | **Rotary dial, welding voltage**<br>Adjustment of the welding voltage from min. to max. |
| 4 |  | **Changeover switch, remote control on/off**<br>ON Set the welding performance via the remote control<br>OFF Set the welding performance via the machine control |
| 5 |  | **Ready for operation signal light**<br>Signal light on when the machine is switched on and ready for operation |

# 5 Design and function

## 5.1 General

**WARNING**

**Risk of injury from electric shock!**
**Contact with live parts, e.g. welding current sockets, is potentially fatal!**

- Follow safety instructions on the opening pages of the operating instructions.
- Commissioning may only be carried out by persons who have the relevant expertise of working with arc welding machines!
- Connection and welding leads (e.g. electrode holder, welding torch, workpiece lead, interfaces) may only be connected when the machine is switched off!

**CAUTION**

**Insulate the arc welder from welding voltage!**
**Not all active parts of the welding current circuit can be shielded from direct contact. To avoid any associated risks it is vital for the welder to adhere to the relevant safety regulations. Even low voltages can cause a shock and lead to accidents.**

- Wear dry and undamaged protective clothing (shoes with rubber soles/welder's gloves made from leather without any studs or braces)!
- Avoid direct contact with non-insulated connection sockets or connectors!
- Always place torches and electrode holders on an insulated surface!

**Risk of burns on the welding current connection!**
**If the welding current connections are not locked, connections and leads heat up and can cause burns, if touched!**

- Check the welding current connections every day and lock by turning in clockwise direction, if necessary.

**Risk of injury due to moving parts!**
**The wire feeders are equipped with moving parts, which can trap hands, hair, clothing or tools and thus injure persons!**

- Do not reach into rotating or moving parts or drive components!
- Keep casing covers or protective caps closed during operation!

**Risk of injury due to welding wire escaping in an unpredictable manner!**
**Welding wire can be conveyed at very high speeds and, if conveyed incorrectly, may escape in an uncontrolled manner and injure persons!**

- Before mains connection, set up the complete wire guide system from the wire spool to the welding torch!
- Remove the pressure rollers from the wire feeder if no welding torch is fitted!
- Check wire guide at regular intervals!
- Keep all casing covers or protective caps closed during operation!

**Risk from electrical current!**
**If welding is carried out alternately using different methods and if a welding torch and an electrode holder remain connected to the machine, the open-circuit/welding voltage is applied simultaneously on all cables.**

- The torch and the electrode holder should therefore always be placed on an insulated surface before starting work and during breaks.

**CAUTION**

**Damage due to incorrect connection!**
**Accessory components and the power source itself can be damaged by incorrect connection!**

- Only insert and lock accessory components into the relevant connection socket when the machine is switched off.
- Comprehensive descriptions can be found in the operating instructions for the relevant accessory components.
- Accessory components are detected automatically after the power source is switched on.

**Using protective dust caps!**
**Protective dust caps protect the connection sockets and therefore the machine against dirt and damage.**

- The protective dust cap must be fitted if there is no accessory component being operated on that connection.
- The cap must be replaced if faulty or if lost!

☞ ***Observe documentation of other system components when connecting!***

## 5.2 Installation

**WARNING**

**Risk of accident due to improper transport of machines that may not be lifted!**
**Do not lift or suspend the machine! The machine can fall down and cause injuries! The handles and brackets are suitable for transport by hand only!**

- The machine may not be lifted by crane or suspended!
- Depending on machine type, equipment for lifting by crane or use while suspended is available as a retrofitting option - See 9 Accessories chapter.

**CAUTION**

**Installation site!**
**The machine must not be operated in the open air and must only be set up and operated on a suitable, stable and level base!**

- The operator must ensure that the ground is non-slip and level, and provide sufficient lighting for the place of work.
- Safe operation of the machine must be guaranteed at all times.

## 5.3 Welding torch cooling system

**CAUTION**

**Coolant mixtures!**
**Mixtures with other liquids or the use of unsuitable coolants result in material damage and renders the manufacturer's warranty void!**

- Only use the coolant described in this manual (overview of coolants).
- Do not mix different coolants.
- When changing the coolant, the entire volume of liquid must be changed.

**Insufficient frost protection in the welding torch coolant!**
**Depending on the ambient conditions, different liquids are used for cooling the welding torch - See 5.3.1 List of coolants chapter.**
**Coolants with frost protection (KF 37E or KF 23E) must be checked regularly to ensure that the frost protection is adequate to prevent damage to the machine or the accessory components.**

- The coolant must be checked for adequate frost protection with the TYP 1 frost protection tester .
- Replace coolant as necessary if frost protection is inadequate!

☞ ***The disposal of coolant must be carried out according to official regulations and observing the relevant safety data sheets (German waste code number: 70104)!***
***Coolant must not be disposed of together with household waste.***
***Coolant must not be discharged into the sewerage system.***
***Recommended cleaning agent: water, if necessary with cleaning agent added.***

### 5.3.1 List of coolants

The following coolants may be used - See 9 Accessories chapter:

| Coolant | Temperature range |
|---|---|
| KF 23E (Standard) | -10 °C to +40 °C |
| KF 37E | -20 °C to +10 °C |

### 5.3.2 Maximal hose package length

| | Pump 3.5 bar | Pump 4.5 bar |
|---|---|---|
| Machines with or without separate wire feeder | 30 m | 60 m |
| Compact machines with additional intermediate drive (example. miniDrive) | 20 m | 30 m |
| Machines with separate wire feeder and additional intermediate drive (example: miniDrive) | 20 m | 60 m |

Data as a rule refer to the entire hose package length
including welding torch. The pump output is shown on the type plate (parameter: Pmax).

Pump 3.5 bar: Pmax = 0.35 MPa (3.5 bar)

Pump 4.5 bar: Pmax = 0.45 MPa (4.5 bar)

## 5.4 Notes on the installation of welding current leads

☞ ***Incorrectly installed welding current leads can cause faults in the arc (flickering).***

☞ ***Lay the workpiece lead and hose package of power sources without HF igniter (MIG/MAG) for as long and as close as possible in parallel.***

☞ ***Lay the workpiece lead and hose package of power sources with HF igniter (TIG) for as long as possible in parallel with a distance of 20 cm to avoid HF sparkover.***

☞ ***Always keep a distance of at least 20 cm to leads of other power sources to avoid interferences***

☞ ***Always keep leads as short as possible! For optimum welding results max. 30 m (welding lead + intermediate hose package + torch lead).***

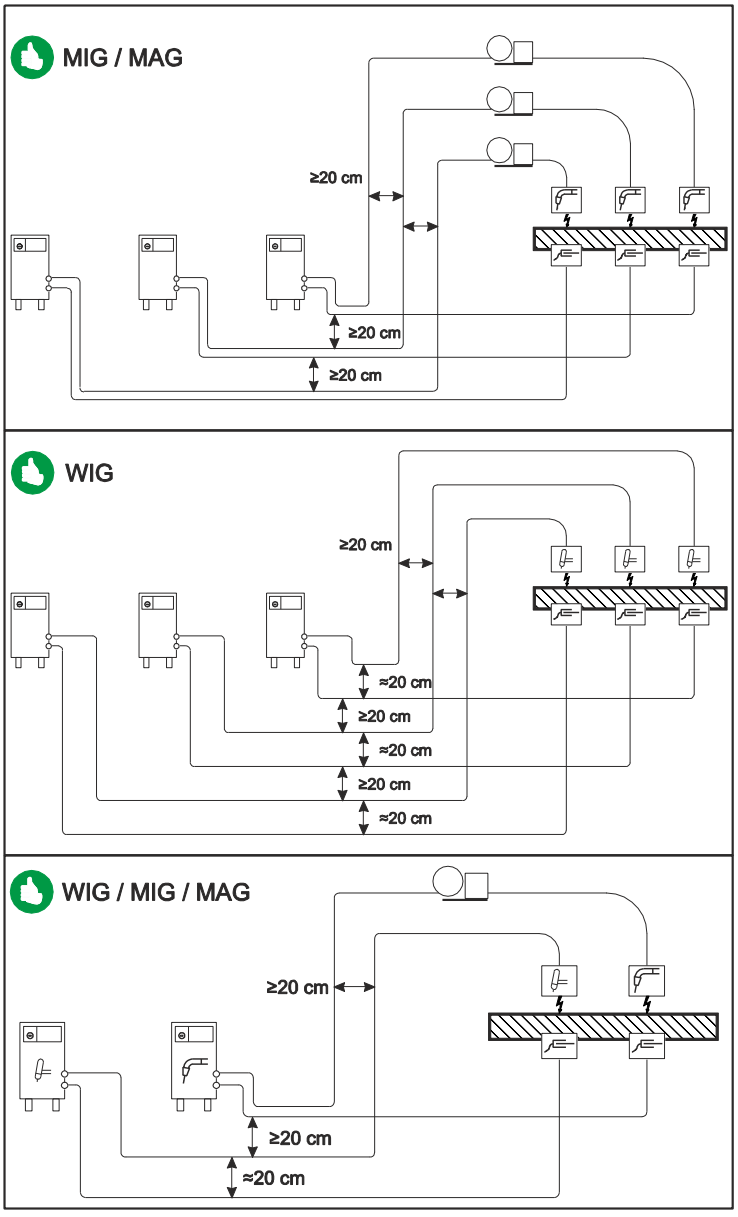



*Figure 5-1*

☞ ***Use an individual welding lead to the workpiece for each welding machine!***

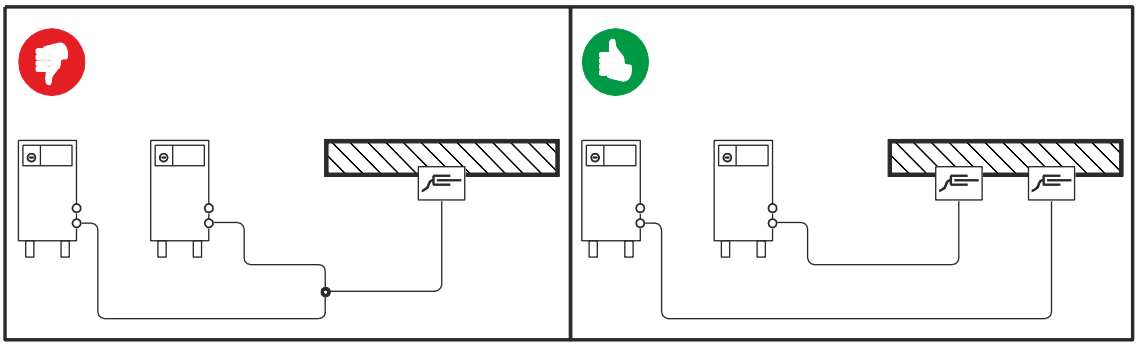


*Figure 5-2*

☞ ***Fully unroll welding current leads, torch hose packages and intermediate hose packages. Avoid loops!***

☞ ***Always keep leads as short as possible!***

☞ ***Lay any excess cable lengths in meanders.***

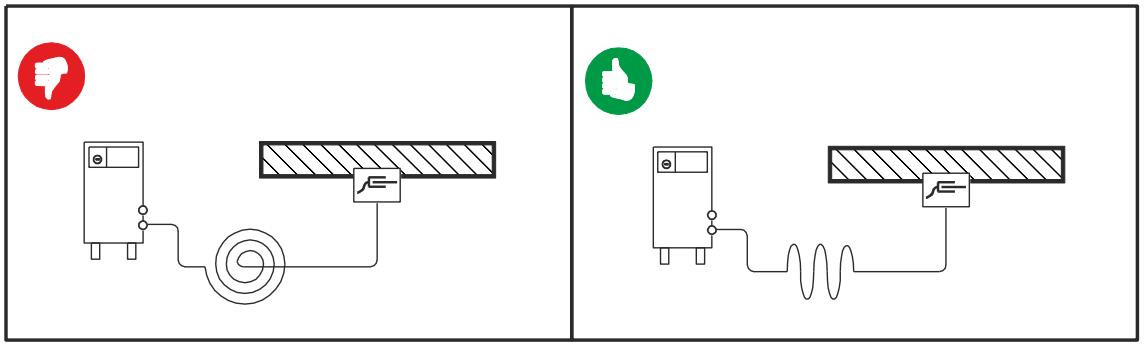


*Figure 5-3*

## 5.5 Connecting the intermediate hose package to the wire feed unit

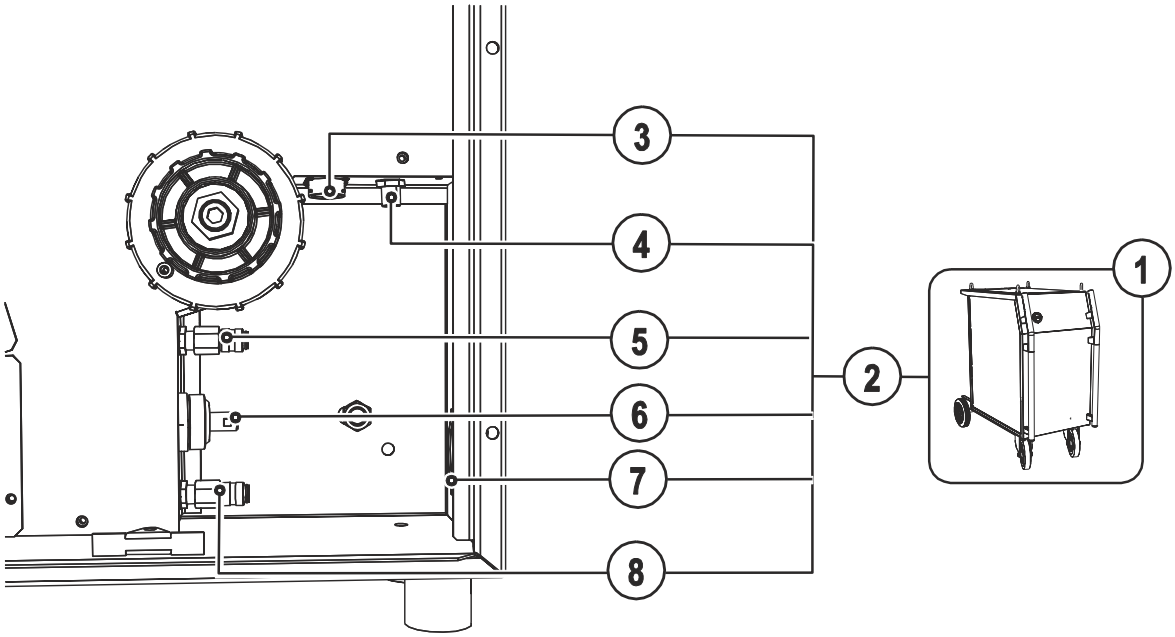



*Figure 5-4*

| Item | Symbol | Description |
|---|---|---|
| 1 | | **Power source** |
| 2 | | **Intermediate hose package** |
| 3 | | **19-pole connection socket (analogue)**<br>Wire feed unit control lead connection |
| 4 | | **Connecting nipple G¼, shielding gas connection** |
| 5 | | **Quick connect coupling (blue)**<br>coolant supply |
| 6 | | **Connector plug, welding current "+"**<br>Welding current connection |
| 7 | | **Strain relief** |
| 8 | | **Quick connect coupling (red)**<br>coolant return |

- Insert the end of the hose package through the strain relief of the hose package and lock by turning to the right.
- Push the welding current cable socket onto the “welding current connecting plug” and lock by turning to the right.
- Connect crown nut of the shielding gas line to the G¼“ connecting nipple.
- Insert cable plug on the control lead into the 19-pole connection socket and secure with crown nut (the plug can only be inserted into the connection socket in one position).
- Lock connecting nipples of the cooling water tubes into the corresponding quick connect couplings:
  Return line red to quick connect coupling, red (coolant return) and
  supply line blue to quick connect coupling, blue (coolant supply).

## 5.6 Shielding gas supply (shielding gas cylinder for welding machine)

### 5.6.1 Gas test

- Slowly open the gas cylinder valve.
- Open the pressure regulator.
- Switch on the power source at the main switch.
- Trigger gas test function on the machine control inside the machine.
- Set the relevant gas quantity for the application on the pressure regulator.
- The gas test is triggered at the machine control inside the machine by pressing the key.

The shielding gas will flow as long as you keep the button pressed.

### 5.6.2 Setting the shielding gas quantity

| Welding process | Recommended shielding gas quantity |
|---|---|
| MAG welding | Wire diameter x 11.5 = l/min |
| MIG brazing | Wire diameter x 11.5 = l/min |
| MIG welding (aluminium) | Wire diameter x 13.5 = l/min (100 % argon) |

**Helium-rich gas mixtures require a higher gas volume!**

The table below can be used to correct the gas volume calculated where necessary:

| Shielding gas | Factor |
|---|---|
| 75% Ar/25% He | 1.14 |
| 50% Ar/50% He | 1.35 |
| 25% Ar/75% He | 1.75 |
| 100% He | 3.16 |

☞ ***Incorrect shielding gas setting!***

- ***If the shielding gas setting is too low or too high, this can introduce air to the weld pool and may cause pores to form.***
- ***Adjust the shielding gas quantity to suit the welding task!***

## 5.7 MIG/MAG welding

### 5.7.1 Welding torch connection

**CAUTION**

**Equipment damage due to improperly connected coolant pipes!**
**If the coolant pipes are not properly connected or a gas-cooled welding torch is used, the coolant circuit is interrupted and equipment damage can occur.**

- Connect all coolant pipes correctly!
- Completely unroll the hose package and the torch hose package!
- Observe maximal hose package length .
- When using a gas-cooled welding torch, use a hose bridge to establish the coolant circuit .

☞ ***On delivery, the Euro torch connector is fitted with a capillary tube for welding torches with a steel liner. Conversion is necessary if a welding torch with a liner is used!***

- ***Operate welding torches with a liner > with a guide tube.***
- ***Operate welding torches with a steel liner > with a capillary tube.***

**Depending on the wire electrode diameter or type, either a steel liner or liner with the correct inner diameter must be inserted in the torch!**

Recommendation:

- Use a steel liner when welding hard, unalloyed wire electrodes (steel).
- Use a chrome nickel liner when welding hard, high-alloy wire electrodes (CrNi).
- Use a liner to weld or braze soft wire electrodes, high-alloy wire electrodes or aluminium materials.

**Preparation for connecting welding torches with a spiral guide:**

- Check that the capillary tube is correctly positioned in relation to the central connector!

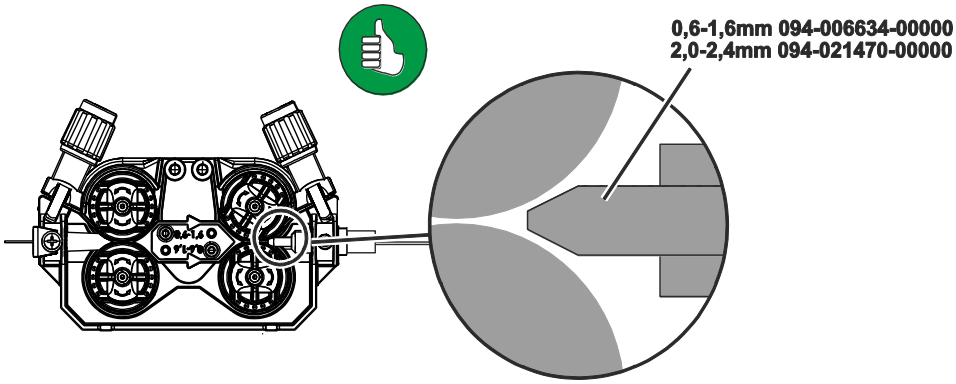



*Figure 5-5*

**Preparation for connecting welding torches with a liner:**

- Push forward the capillary tube on the wire feed side in the direction of the Euro torch connector and remove it there.
- Insert the liner guide tube from the Euro torch connector side.
- Carefully insert the welding torch connector with as yet too long a liner into the Euro torch connector and secure with a crown nut.
- Cut off the liner with a liner cutter just before the wire feed roller.
- Loosen the welding torch connector and remove.
- Carefully chamfer the cut off end of the liner with a liner sharpener  and sharpen.

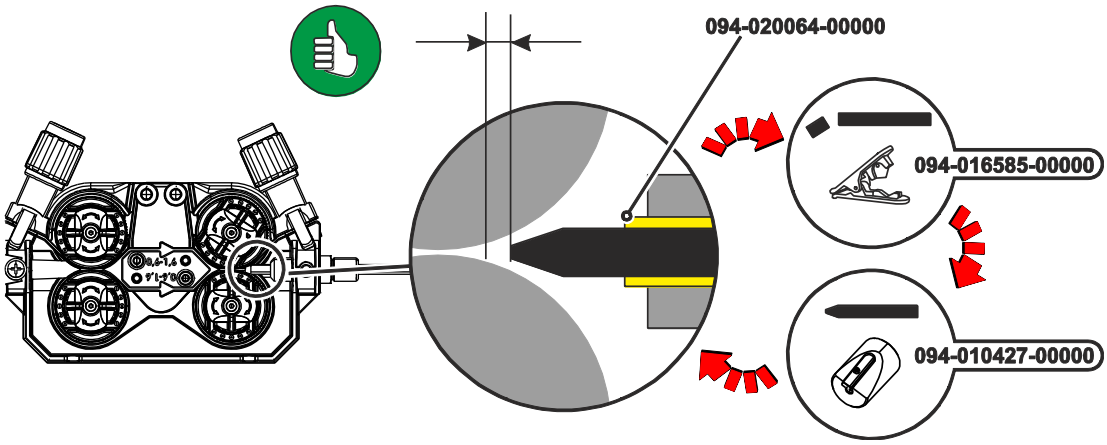



*Figure 5-6*

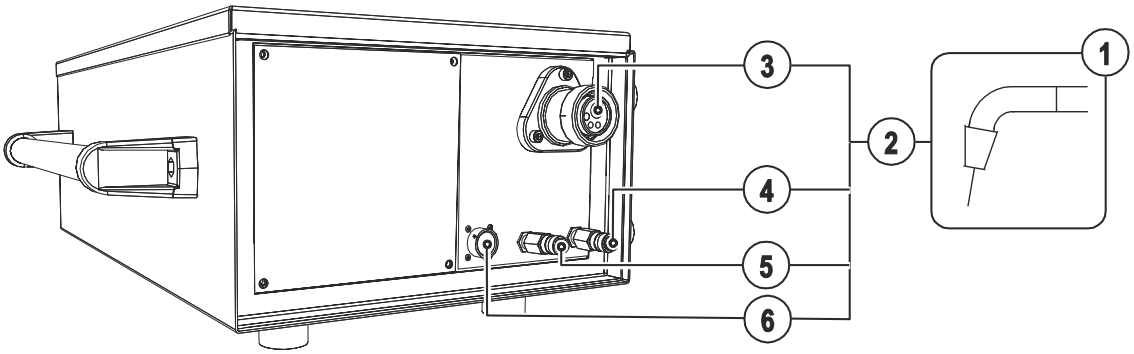



*Figure 5-7*

| Item | Symbol | Description |
|---|---|---|
| 1 | | **Welding torch** |
| 2 | | **Welding torch hose package** |
| 3 | | **Welding torch connection (Euro or Dinse torch connector)**<br>Welding current, shielding gas and torch trigger integrated |
| 4 | | **Quick connect coupling (red)**<br>coolant return |
| 5 | | **Quick connect coupling (blue)**<br>coolant supply |
| 6 | | **19-pole connection socket (analogue)**<br>For connecting analogue accessory components (remote control, welding torch control lead, etc.) |

- Insert the central plug for the welding torch into the central connector and screw together with crown nut.

**Where applicable:**

- Lock connecting nipples of the cooling water tubes into the corresponding quick connect couplings:
  Return line red to quick connect coupling, red (coolant return) and
  supply line blue to quick connect coupling, blue (coolant supply).
- Insert the welding torch control cable into the 19-pole connection socket and lock (MIG/MAG torches with additional control cables only).

## 5.7.2 Wire feed

### 5.7.2.1 Open the protective flap of the wire feeder

**CAUTION**

**To perform the following steps, the protective flap of the wire feeder needs to be opened. Make sure to close the protective flap again before starting to work.**

- Unlock and open protective flap.

### 5.7.2.2 Inserting the wire spool

**CAUTION**

**Risk of injury due to incorrectly secured wire spool.**
**If the wire spool is not secured properly, it may come loose from the wire spool holder and fall to the ground, causing damage to the machine and injuries.**

- Securely fasten the wire spool to the wire spool holder using the knurled nut.
- Before you start working, always check the wire spool is securely fastened.

☞ ***Standard D300 wire spool holder can be used. Adapters - See 9 Accessories chapter are required when using standardised basket coils (DIN 8559).***

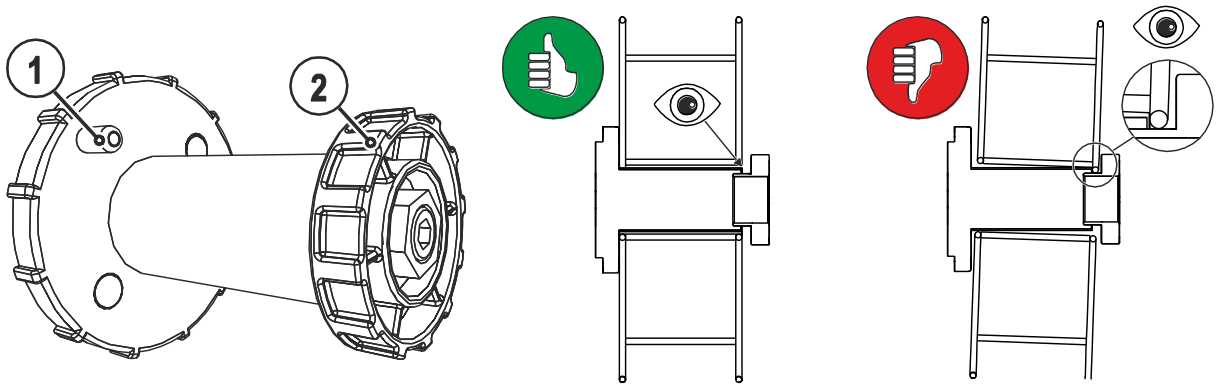



*Figure 5-8*

| Item | Symbol | Description |
|---|---|---|
| 1 | | **Carrier pin**<br>For fixing the wire spool |
| 2 | | **Knurled nut**<br>For fixing the wire spool |

- Loosen knurled nut from spool holder.
- Fix welding wire reel onto the spool holder so that the carrier pin locks into the spool bore.
- Fasten wire spool using knurled nut.

### 5.7.2.3 Changing the wire feed rollers

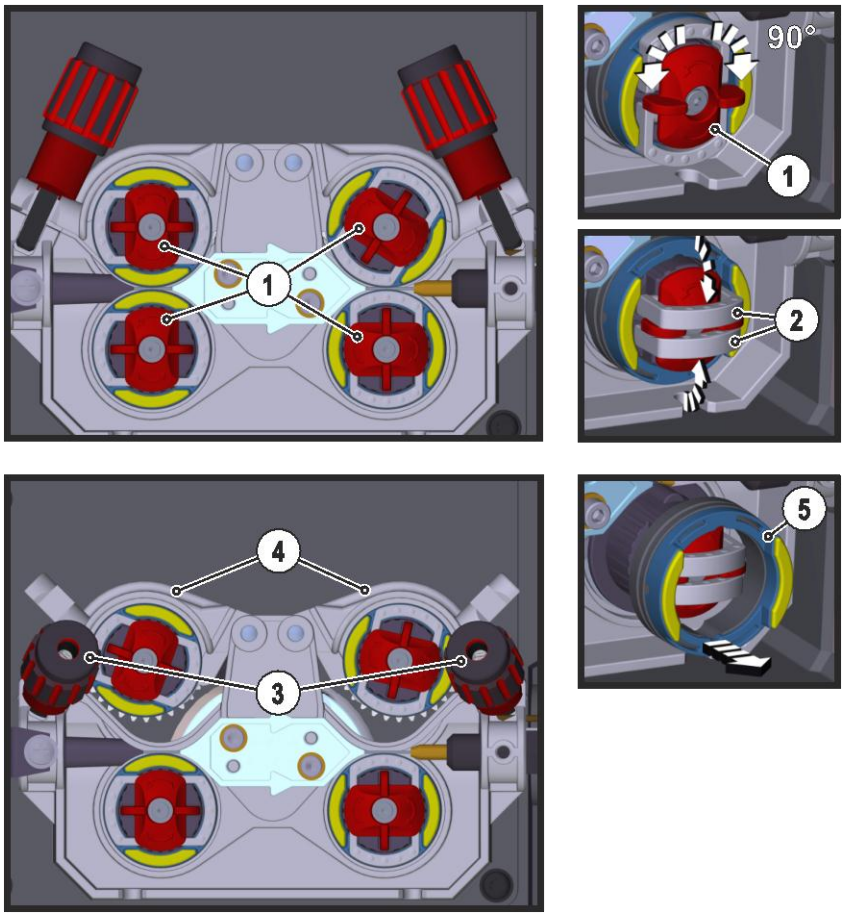


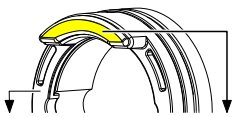
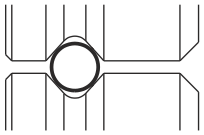
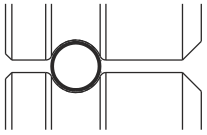
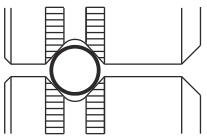

*Figure 5-9*

| Item | Symbol | Description |
|---|---|---|
| 1 | | **Tommy**<br>The tommy is used to secure the closure brackets of the wire feed rollers. |
| 2 | | **Closure bracket**<br>The closure brackets are used to secure the wire feed rollers. |
| 3 | | **Feed roll tensioner**<br>Fixing the clamping unit and setting the pressure. |
| 4 | | **Clamping unit** |
| 5 | | **Wire feed roller**<br>see the Wire feed roller overview table |

- Rotate the tommy by 90° clockwise or anti-clockwise (tommy locks into place).
- Fold the closure brackets outwards by 90°.
- Unfasten pressure units and fold out (clamping units and pressure rollers will automatically flip upwards).
- Remove the wire feed rollers from the roller support.
- Select new wire feed rollers accoridng to the Wire feed roller overview table and reassemble the wire feed mechanism in reverse order.

☞ ***Unsatisfactory welding results due to faulty wire feeding!***
***The wire feed rollers must be suitable for the diameter of the wire and the material. The wire feed rollers are colour-coded to facilitate distinction (see the Wire feed roller overview table).***

**Wire feed roller overview table**

| Material | Diameter | | Colour code |  | | Groove form |
|---|---|---|---|---|---|---|
| | ∅ mm | ∅ inch | | | | |
| Steel<br>Stainless steel<br>Brazing | 0.6 | .023 | monochrome | light pink | - |  <br>V-groove |
| | 0.8 | .030 | | white | | |
| | 0.9/1.0 | .035/.040 | | blue | | |
| | 1.2 | 045 | | red | | |
| | 1.4 | 052 | | green | | |
| | 1.6 | 060 | | black | | |
| | 2.0 | .080 | | grey | | |
| | 2.4 | .095 | | brown | | |
| | 2.8 | .110 | | Light green | | |
| | 3.2 | .125 | | purple | | |
| Aluminium | 0.8 | .030 | bichrome | white | yellow |  <br>U-groove |
| | 0.9/1.0 | .035/.040 | | blue | | |
| | 1.2 | .045 | | red | | |
| | 1.6 | .060 | | black | | |
| | 2.0 | .080 | | grey | | |
| | 2.4 | .095 | | brown | | |
| | 2.8 | .110 | | Light green | | |
| | 3.2 | .125 | | purple | | |
| Flux cored wire | 0.8 | .030 | bichrome | white | orange |  <br>V-groove, knurled |
| | 0.9<br>1.0 | .035<br>.040 | | blue | | |
| | 1.2 | .045 | | red | | |
| | 1.4 | .052 | | green | | |
| | 1.6 | .060 | | black | | |
| | 2.0 | .080 | | grey | | |
| | 2.4 | .095 | | brown | | |

☞ ***- See 10 Replaceable parts chapter***

### 5.7.2.4 Inching the wire electrode

**CAUTION**

**Risk of injury due to moving parts!**
**The wire feeders are equipped with moving parts, which can trap hands, hair, clothing or tools and thus injure persons!**
- Do not reach into rotating or moving parts or drive components!
- Keep casing covers or protective caps closed during operation!

**Risk of injury due to welding wire escaping in an unpredictable manner!**
**Welding wire can be conveyed at very high speeds and, if conveyed incorrectly, may escape in an uncontrolled manner and injure persons!**
- Before mains connection, set up the complete wire guide system from the wire spool to the welding torch!
- Remove the pressure rollers from the wire feeder if no welding torch is fitted!
- Check wire guide at regular intervals!
- Keep all casing covers or protective caps closed during operation!

**Risk of injury due to welding wire escaping from the welding torch!**
**The welding wire can escape from the welding torch at high speed and cause bodily injury including injuries to the face and eyes!**
- Never direct the welding torch towards your own body or towards other persons!

**CAUTION**

**Extensive wear due to incorrect contact pressure!**
**Incorrect contact pressure will cause extensive wear of the wire feed rollers!**
- With the adjusting nuts of the pressure units set the contact pressure so that the wire electrode is conveyed but will still slip through if the wire spool jams.
- Set the contact pressure of the front rollers (in wire feed direction) to a higher value!

☞ ***The inching speed is infinitely adjustable by simultaneously pressing the wire inching push-button and turning the wire speed rotary knob. The left display shows the wire feed speed selected, the right display shows the current motor current of the wire feed mechanism.***

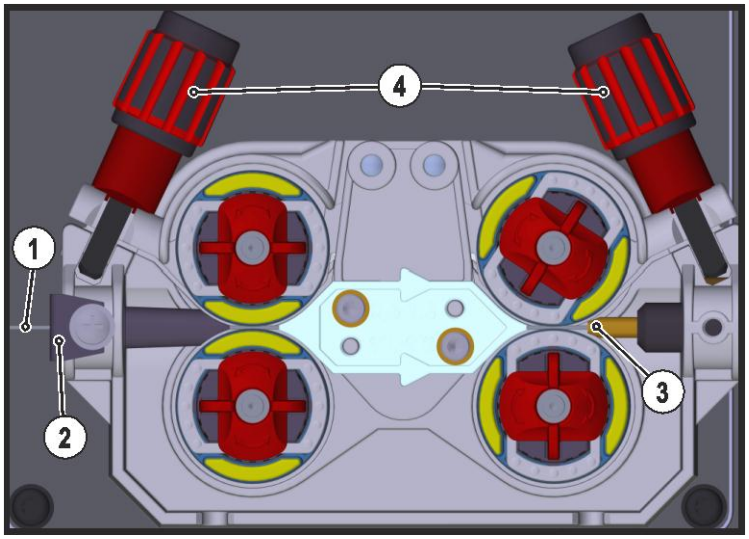



*Figure 5-10*

| Item | Symbol | Description |
|---|---|---|
| 1 | | **Welding wire** |
| 2 | | **Wire feed nipple** |
| 3 | | **Guide tube** |
| 4 | | **Adjusting nut** |

- Extend and lay out the torch hose package.
- Carefully unwind the welding wire from the wire spool and insert through the wire feed nipples up to the wire feed rollers.
- Press the inching push-button (the drive catches the welding wire and automatically guides it to the welding torch outlet).

☞ ***A prerequisite for the automatic inching process is the correct preparation of the wire guide, especially in the capillary and wire guide tube area .***

- The contact pressure has to be adjusted separately for each side (wire inlet/outlet) at the feed roll tensioner setting nuts depending on the welding consumable used. A table with the setting values can be found on a sticker near the wire drive.

**Version 1: left hand mounting**

| | | | | |
|---|---|---|---|---|
| 3-3,5 | mild steel stainless steel brazing | 1 3 5 2 4 | mild steel stainless steel brazing | 2,5 |
| 2-2,5 | aluminium | | aluminium | 1 |
| 2,5-3 | flux-cored | | flux-cored | 2 |

**Version 2: right hand mounting**

| | | | | |
|---|---|---|---|---|
| 2,5 | mild steel stainless steel brazing | 1 3 5 2 4 | mild steel stainless steel brazing | 3-3,5 |
| 1 | aluminium | | aluminium | 2-2,5 |
| 2 | flux-cored | | flux-cored | 2,5-3 |

*Figure 5-11*

**Automatic inching stop**

Touch the welding torch against the workpiece during inching. Inching of the welding wire will stop as soon it touches the workpiece.

#### 5.7.2.5 Spool brake setting

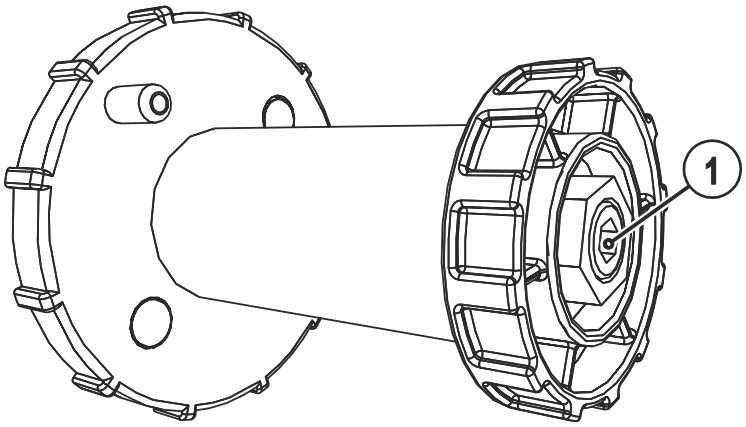



*Figure 5-12*

| Item | Symbol | Description |
|---|---|---|
| 1 | | **Allen screw**<br>Securing the wire spool retainer and adjustment of the spool brake |

- Tighten the Allen screw (8 mm) in the clockwise direction to increase the braking effect.

☞ ***Tighten the spool brake until the wire spool no longer turns when the wire feed motor stops but without it jamming during operation!***

### 5.7.3 Standard MIG/MAG torch

The MIG welding torch trigger is essentially used to start and stop the welding process.

| Operating elements | Functions |
|---|---|
| Torch trigger | • Start/stop welding |

### 5.7.4 MIG/MAG special-torches

**Function specifications and more indepth information can be found in the operating manual for the relevant welding torch!**

## 5.7.5 Welding task selection

☞ ***Selection of a welding task involves the interaction of the controls on the welding machine and the wire feed unit. After the basic settings are made on the welding machine, the operating point and other parameters can be set on the wire feed unit.***

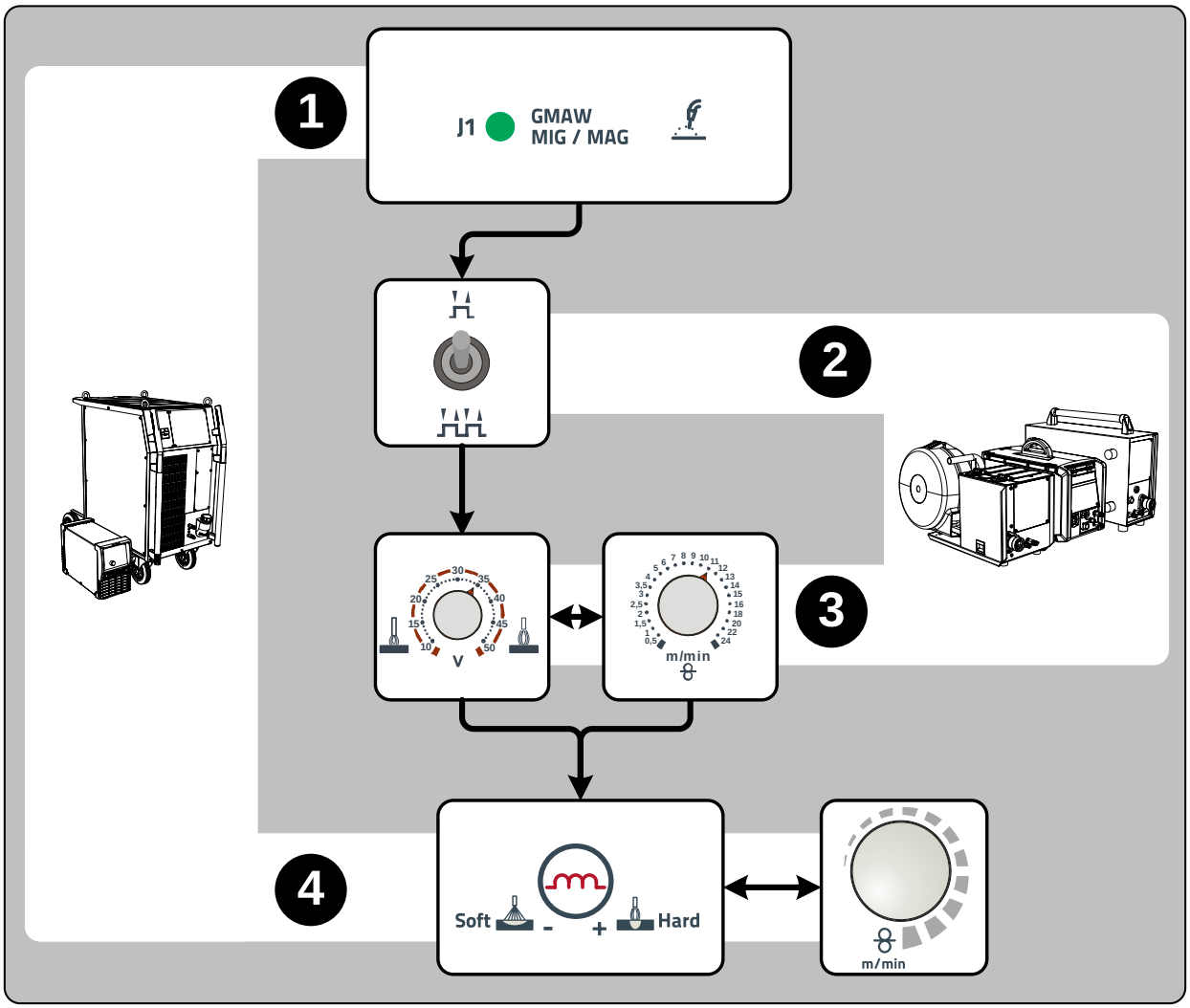



*Figure 5-13*

### 5.7.5.1 Accessory components for operating point setting

The operating point setting can also be made with the accessory components

- R11 / RG11 remote control
- Up/Down torch with two rockers (2 U/D)

You will find an overview of accessory components in the "Accessories" chapter. See the operating instructions for the machine in question for a more detailed description of the individual machines and their functions.

- See 9 Accessories chapter

## 5.8 Remote control

**CAUTION**

**Damage due to the use of non-genuine parts!**
**The manufacturer's warranty becomes void if non-genuine parts are used!**

- Only use system components and options (power sources, welding torches, electrode holders, remote controls, spare parts and replacement parts, etc.) from our range of products!
- Only insert and lock accessory components into the relevant connection socket when the machine is switched off.

☞ ***The remote controls are operated on the 19-pole remote control connection socket (analogue).***

☞ ***Please note the relevant documentation of the accessory components.***

The operation of the remote control and its settings are directly dependent on the configuration of the respective welding machine or wire feed unit. The settings are defined by changeover switches or by setting special parameters (dependent on the control).

Infinite adjustment of the operating point (wire speed/welding voltage).

- Switch remote control ON/OFF changeover switch to the ON position.
- Switch machine operation changeover switch (operating point) to  (see corresponding documentation).

# 6 Maintenance, care and disposal

**DANGER**

**Improper maintenance and testing**
**The equipment may only be cleaned, repaired or tested by specialist, skilled persons! A skilled person is one who, due to training, knowledge and experience, is able to recognise the dangers that can occur during testing of this equipment as well as possible subsequent damage and who is able to implement the required safety procedures.**

- Complete all tests given in the chapter below!
- Only put the equipment back into operation following a successful test.

**Risk of injury from electric shock!**
**Cleaning machines that are not disconnected from the mains can lead to serious injuries!**

- Disconnect the machine completely from the mains.
- Remove the mains plug!
- Wait for 4 minutes until the capacitors have discharged!

Repair and maintenance work may only be performed by qualified authorised personnel; otherwise the right to claim under warranty is void. In all service matters, always consult the dealer who supplied the machine. Return deliveries of defective equipment subject to warranty may only be made through your dealer. When replacing parts, use only original spare parts. When ordering spare parts, please quote the machine type, serial number and item number of the machine, as well as the type designation and item number of the spare part.

## 6.1 General

When used in the specified environmental conditions and under normal operating conditions, this machine is largely maintenance-free and requires a minimum of care.

There are some points, which should be observed, to guarantee fault-free operation of your welding machine. Among these are regular cleaning and checking as described below, depending on the pollution level of the environment and the length of time the unit is in use.

## 6.2 Maintenance work, intervals

### 6.2.1 Daily maintenance tasks

- Check that all connections and wearing parts are hand-tight and tighten if necessary.
- Check that all screw and plug connections and replaceable parts are secured correctly, tighten if necessary.
- Remove any spatter.
- Clean the wire feed rollers on a regular basis (depending on the degree of soiling).

#### 6.2.1.1 Visual inspection

- Check hose package and power connections for exterior damage and replace or have repaired by specialist staff as necessary!
- Mains supply lead and its strain relief
- Gas tubes and their switching equipment (solenoid valve)
- Other, general condition

#### 6.2.1.2 Functional test

- Check correct mounting of the wire spool.
- Welding current cables (check that they are fitted correctly and secured)
- Gas cylinder securing elements
- Operating, message, safety and adjustment devices (Functional test)

### 6.2.2 Monthly maintenance tasks

#### 6.2.2.1 Visual inspection

- Casing damage (front, rear and side walls)
- Wheels and their securing elements
- Transport elements (strap, lifting lugs, handle)
- Check coolant tubes and their connections for impurities

#### 6.2.2.2 Functional test

- Selector switches, command devices, emergency stop devices, voltage reducing devices, message and control lamps
- Check that the wire guide elements (inlet nipple, wire guide tube) are fitted securely.

### 6.2.3 Annual test (inspection and testing during operation)

☞ ***The welding machine may only be tested by competent, capable personsl. A capable person is one who, because of his training, knowledge and experience, is able to recognise the dangers that can occur while testing welding power sources as well as possible subsequent damage and who is able to implement the required safety procedures.***

☞ ***For more information refer to the "Warranty registration" brochure supplied and our information regarding warranty, maintenance and testing at www.ewm-group.com!***

A periodic test according to IEC 60974-4 "Periodic inspection and test" has to be carried out. In addition to the regulations on testing given here, the relevant local laws and regulations must also be observed.

## 6.3 Disposing of equipment

☞ ***Proper disposal!***
***The machine contains valuable raw materials, which should be recycled, and electronic components, which must be disposed of.***

- ***Do not dispose of in household waste!***
- ***Observe the local regulations regarding disposal!***

### 6.3.1 Manufacturer's declaration to the end user

- According to European provisions (guideline 2002/96/EG of the European Parliament and the Council of January, 27th 2003), used electric and electronic equipment may no longer be placed in unsorted municipal waste. It must be collected separately. The symbol depicting a waste container on wheels indicates that the equipment must be collected separately.
  This machine is to be placed for disposal or recycling in the waste separation systems provided for this purpose.
- According to German law (law governing the distribution, taking back and environmentally correct disposal of electric and electronic equipment (ElektroG) from 16.03.2005), used machines are to be placed in a collection system separate from unsorted municipal waste. The public waste management utilities (communities) have created collection points at which used equipment from private households can be disposed of free of charge.
- Information about giving back used equipment or about collections can be obtained from the respective municipal administration office.
- EWM participates in an approved waste disposal and recycling system and is registered in the Used Electrical Equipment Register (EAR) under number WEEE DE 57686922.
- In addition to this, returns are also possible throughout Europe via EWM sales partners.

## 6.4 Meeting the requirements of RoHS

We, EWM AG Mündersbach, hereby confirm that all products supplied by us which are affected by the RoHS Directive, meet the requirements of the RoHS (Directive 2011/65/EU).

# 7 Rectifying faults

All products are subject to rigorous production checks and final checks. If, despite this, something fails to work at any time, please check the product using the following flowchart. If none of the fault rectification procedures described leads to the correct functioning of the product, please inform your authorised dealer.

## 7.1 Checklist for rectifying faults

☞ ***The correct machine equipment for the material and process gas in use is a fundamental requirement for perfect operation!***

| Legend | Symbol | Description |
|---|---|---|
| | ↯ | Fault/Cause |
| | 🛠 | Remedy |

**Coolant error/no coolant flowing**

↯ Insufficient coolant flow
- 🛠 Check coolant level and refill if necessary

↯ Air in the coolant circuit
- 🛠 Vent coolant circuit - See 7.4 Vent coolant circuit chapter

**Wire feed problems**

↯ Contact tip blocked
- 🛠 Clean, spray with anti-spatter spray and replace if necessary

↯ Setting the spool brake - See 5.7.2.5 Spool brake setting chapter
- 🛠 Check settings and correct if necessary

↯ Setting pressure units - See 5.7.2.4 Inching the wire electrode chapter
- 🛠 Check settings and correct if necessary

↯ Worn wire rolls
- 🛠 Check and replace if necessary

↯ Wire feed motor without supply voltage (automatic cutout triggered by overloading)
- 🛠 Reset triggered fuse (rear of the power source) by pressing the key button

↯ Kinked hose packages
- 🛠 Extend and lay out the torch hose package

↯ Wire guide core or spiral is dirty or worn
- 🛠 Clean core or spiral; replace kinked or worn cores

**Functional errors**

↯ Machine control without displaying the signal lights after switching on
- 🛠 Phase failure > check mains connection (fuses)

↯ No welding performance
- 🛠 Phase failure > check mains connection (fuses)

↯ Various parameters cannot be set
- 🛠 Entry level is blocked, disable access lock

↯ Connection problems
- 🛠 Make control lead connections and check that they are fitted correctly.

↯ Loose welding current connections
- 🛠 Tighten power connections on the torch and/or on the workpiece
- 🛠 Tighten contact tip correctly

## 7.2 Error messages (power source)

☞ ***A welding machine error is indicated by an error code being displayed (see table) on the display on the machine control.***
***In the event of a machine error, the power unit is shut down.***

☞ ***The display of possible error numbers depends on the machine version (interfaces/functions).***

- Document machine errors and inform service staff as necessary.
- If multiple errors occur, these are displayed in succession.

| Error | Category | | | Possible cause | Remedy |
|---|---|---|---|---|---|
| | a) | b) | c) | | |
| Error 1 (Ov.Vol) | - | - | x | Mains overvoltage | Check the mains voltages and compare with the connection voltages of the welding machine |
| Error 2 (Un.Vol) | - | - | x | Mains undervoltage | |
| Error 3 (Temp) | x | - | - | Welding machine excess temperature | Allow the machine to cool down (mains switch to "1") |
| Error 4 (Water) | x | x | - | Low coolant level | Top off the coolant<br>Leak in the coolant circuit > rectify the leak and top off the coolant<br>Coolant pump is not working > check excess current trigger on air cooling unit |
| Error 5 (Wi.Spe) | x | - | - | Wire feeder/speedometer error | Check the wire feeder<br>speedometer is not issuing a signal, M3.51 defective > inform Service |
| Error 6 (gas) | x | - | - | Shielding gas error | Check shielding gas supply (for machines with shielding gas monitoring) |
| Error 7 (Se.Vol) | - | - | x | Secondary excess voltage | Inverter error > inform Service |
| Error 8 (no PE) | - | - | x | Earth fault between welding wire and earth line | Separate the connection between the welding wire and casing or an earthed object |
| Error 9 (fast stop) | x | - | - | Fast cut-out triggered by BUSINT X11 or RINT X12 | Rectify error on robot |
| Error 10 (no arc) | - | x | - | Arc break triggered by BUSINT X11 or RINT X12 | Check wire feeding |
| Error 11 (no ign) | - | x | - | Ignition fault after 5 s triggered by BUSINT X11 or RINT X12 | Check wire feeding |
| Error 14 (no DV) | - | x | - | Wire feeder not detected. Control cable not connected. | Check cable connection |
| | | | | Incorrect ID numbers assigned during operation with multiple wire feeders. | Check assignment of ID numbers |
| Error 15 (DV2?) | - | x | - | Wire feeder 2 not detected. Control cable not connected. | Check cable connection |
| Error 16 (VRD) | - | - | x | VRD (open circuit voltage reduction error) | Inform Service |
| Error 17 (WF. Ov.) | - | x | x | Wire feed mechanism overcurrent detection | Check the wire feeding |
| Error 18 (WF. Sl.) | - | x | x | No speedometer signal from second wire feeder (slave drive) | Check the connection and particularly the speedometer of the second wire feeder (slave drive). |

| Error | Category | | | Possible cause | Remedy |
|---|---|---|---|---|---|
| | a) | b) | c) | | |
| Error 56 (no Pha) | - | - | x | Mains phase failure | Check mains voltages |

**Legend for categories (error reset)**

a) The error message will disappear once the error has been rectified.

b) The error message can be reset by pressing a key button:

| Welding machine control | Key button |
|---|---|
| RC1 / RC2 |   |
| Expert |   |
| CarExpert / Progress (M3.11) |  |
| alpha Q / Concept / Basic / Basic S / Synergic / Synergic S / Progress (M3.71) / Picomig 305 | not possible |

c) The error message can only be reset by switching the machine off and on again.

The shielding gas error (Err 6) can be reset by pressing the "Welding parameters" key button.

## 7.3 Welding parameter calibration

When differentiating between the welding parameters set on the wire feed unit/remote control and those shown on the welding machine, they can be calibrated easily with this function.

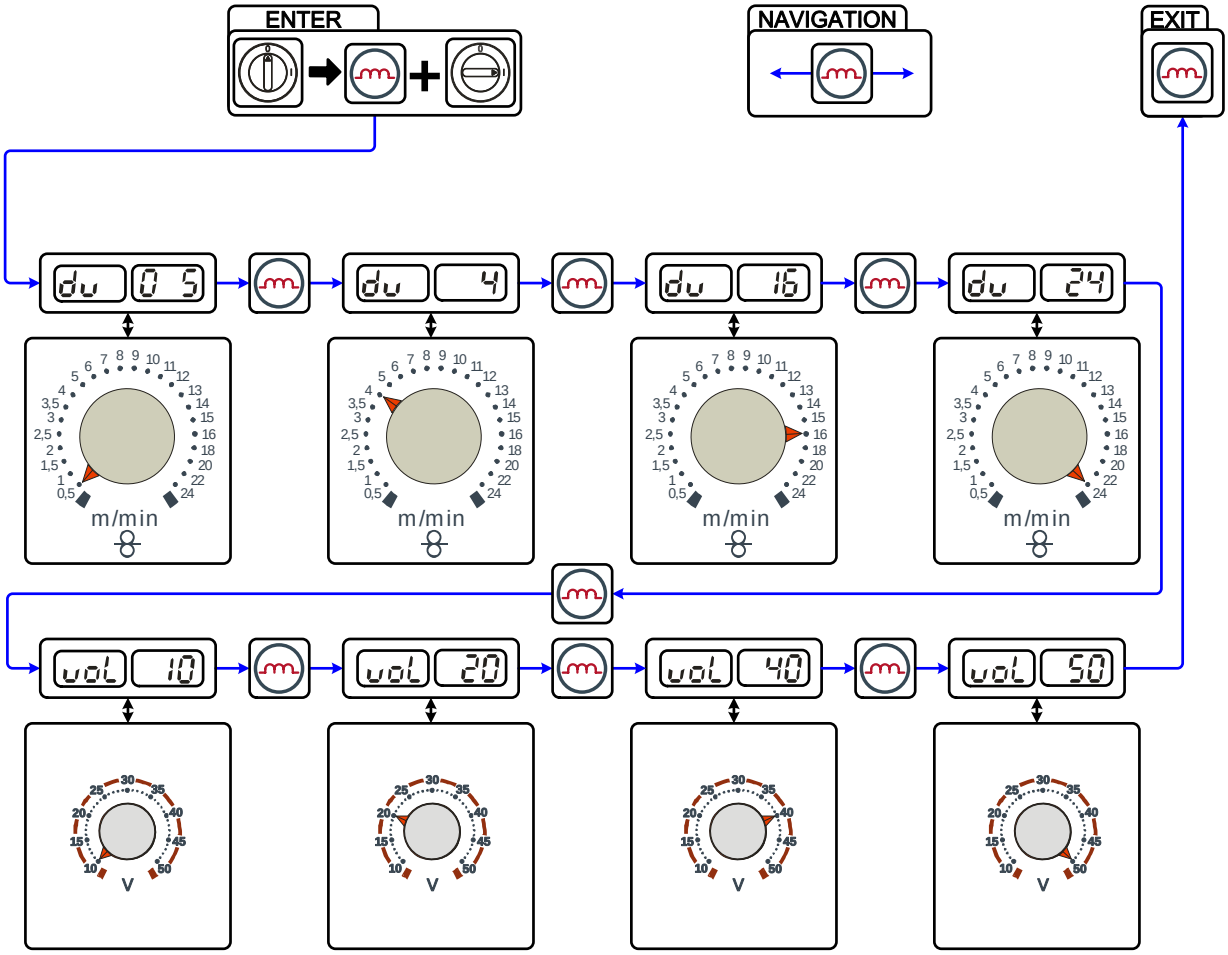



*Figure 7-1*

## 7.4 Vent coolant circuit

☞ *Coolant tank and quick connect coupling of coolant supply and return are only fitted in machines with water cooling.*

☞ *To vent the cooling system always use the blue coolant connection, which is located as deep as possible inside the system (close to the coolant tank)!*

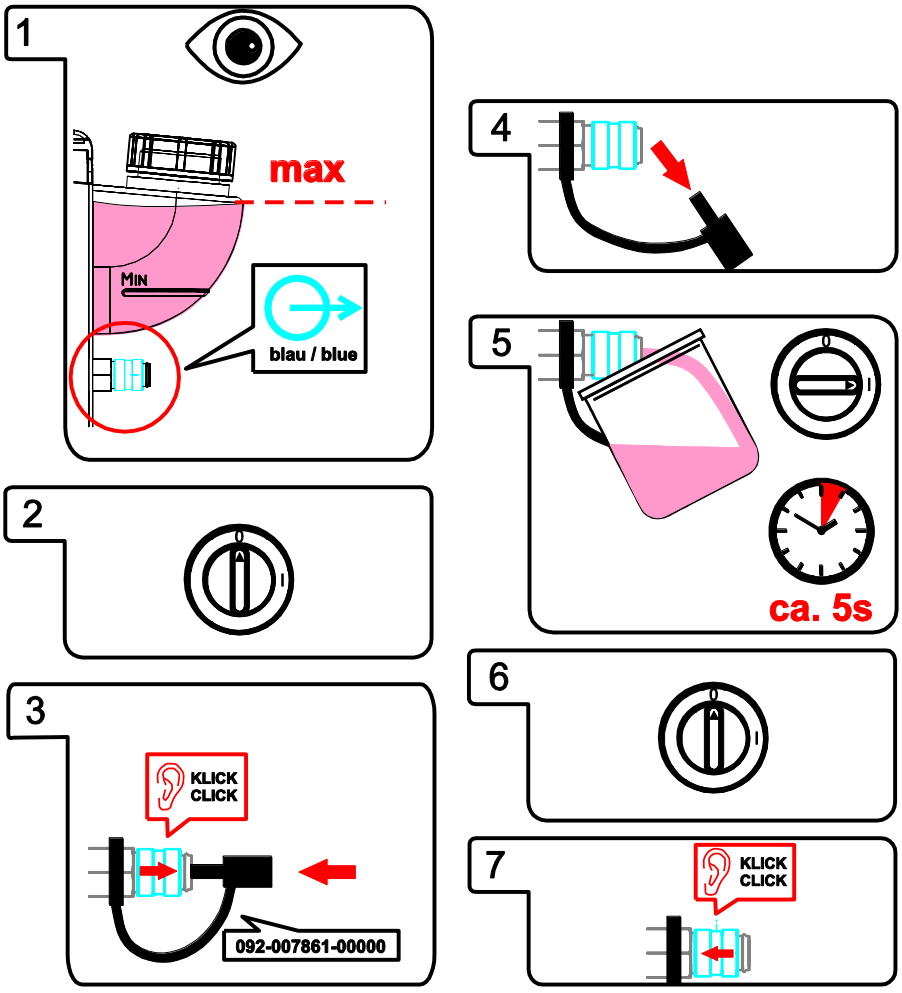



*Figure 7-2*

# 8 Technical data

☞ ***Performance specifications and guarantee only in connection with original spare and replacement parts!***

## 8.1 drive 4 IC Basic

| | |
|---|---|
| **Supply voltage** | 42 VAC |
| **Max. welding current at 60% DC** | 550 A |
| **Max. welding current at 100% DC** | 420 A |
| **Wire feed speed** | 0.5 m/min to 25 m/min<br>19,68 ipm – 944,88 ipm |
| **Factory-fit roller equipment** | 1.0 + 1.2 mm (for steel wire) |
| **Drive** | 4-roller (37 mm) |
| **Connecting the welding torch** | Welding torch central connection (Euro) |
| **Protection classification** | IP 23 |
| **Ambient temperature*** | -25 °C to +40 °C |
| **Dimensions L x W x H in mm** | 633 x 496 x 262 |
| **Weight** | 22 kg |
| **EMC class** | A |
| **Constructed to standards** | IEC 60974-1, -5, -10<br>CE |

☞ ****Ambient temperature depends on coolant! Observe the coolant temperature range for the welding torch cooling!***

# 9 Accessories

☞ ***Performance-dependent accessories like torches, workpiece leads, electrode holders or intermediate hose packages are available from your authorised dealer.***

## 9.1 General accessories

| Type | Designation | Item no. |
|---|---|---|
| AK300 | Wire spool adapter K300 | 094-001803-00001 |
| HOSE BRIDGE UNI | Tube bridge | 092-007843-00000 |
| SPL | Sharpener for plastic liners | 094-010427-00000 |
| HC PL | Hose cutter | 094-016585-00000 |

## 9.2 Remote control / connection cable

| Type | Designation | Item no. |
|---|---|---|
| R11 19POL | Remote control | 090-008601-00502 |
| RG11 19POL 5M | Remote control | 090-008107-00000 |
| RA5 19POL 5M | Remote control e.g. connection cable | 092-001470-00005 |
| RA10 19POL 10M | Remote control e.g. connection cable | 092-001470-00010 |
| RA20 19POL 20M | Remote control e.g. connection cable | 092-001470-00020 |

## 9.3 Options

| Type | Designation | Item no. |
|---|---|---|
| ON WAKD 4/41 | Optional wheel assembly retrofit kit drive 4/41 | 090-008035-00000 |
| ON PS Phoenix drive 4 | Pivot support for housing a drive 4 type wire feed unit | 092-002280-00000 |

# 10 Replaceable parts

**CAUTION**

**Damage due to the use of non-genuine parts!**
**The manufacturer's warranty becomes void if non-genuine parts are used!**

- Only use system components and options (power sources, welding torches, electrode holders, remote controls, spare parts and replacement parts, etc.) from our range of products!
- Only insert and lock accessory components into the relevant connection socket when the machine is switched off.

## 10.1 Wire feed rollers

### 10.1.1 Wire feed rollers for steel wire

| Type | Designation | Item no. |
|---|---|---|
| FE 4R 0.6 MM/0.023 INCH LIGHT PINK | Drive roll set, 37 mm, 4 rolls, V-groove for steel, stainless steel and brazing | 092-002770-00006 |
| FE 4R 0.8 MM/0.03 INCH WHITE | Drive roll set, 37 mm, 4 rolls, V-groove for steel, stainless steel and brazing | 092-002770-00008 |
| FE 4R 1,0 MM/0.04 INCH BLUE | Drive roll set, 37 mm, 4 rolls, V-groove for steel, stainless steel and brazing | 092-002770-00010 |
| FE 4R 1.2 MM/0.045 INCH RED | Drive roll set, 37 mm, 4 rolls, V-groove for steel, stainless steel and brazing | 092-002770-00012 |
| FE 4R 1.4 MM/0.052 INCH GREEN | Drive roll set, 37 mm, 4 rolls, V-groove for steel, stainless steel and brazing | 092-002770-00014 |
| FE 4R 1.6 MM/0.06 INCH BLACK | Drive roll set, 37 mm, 4 rolls, V-groove for steel, stainless steel and brazing | 092-002770-00016 |
| FE 4R 2.0 MM/0.08 INCH GREY | Drive roll set, 37 mm, 4 rolls, V-groove for steel, stainless steel and brazing | 092-002770-00020 |
| FE 4R 2.4 MM/0.095 INCH BROWN | Drive roll set, 37 mm, 4 rolls, V-groove for steel, stainless steel and brazing | 092-002770-00024 |
| FE 4R 2.8 MM/0.11 INCH LIGHT GREEN | Drive roll set, 37 mm, 4 rolls, V-groove for steel, stainless steel and brazing | 092-002770-00028 |
| FE 4R 3.2 MM/0.12 INCH VIOLET | Drive roll set, 37 mm, 4 rolls, V-groove for steel, stainless steel and brazing | 092-002770-00032 |

### 10.1.2 Wire feed rollers for aluminium wire

| Type | Designation | Item no. |
|---|---|---|
| AL 4R 0.8 MM/0.03 INCH WHITE | Drive roll set, 37 mm, for aluminium | 092-002771-00008 |
| AL 4R 1.0 MM/0.04 INCH BLUE | Drive roll set, 37 mm, for aluminium | 092-002771-00010 |
| AL 4R 1.2 MM/0.045 INCH RED | Drive roll set, 37 mm, for aluminium | 092-002771-00012 |
| AL 4R 1.6 MM/0.06 INCH BLACK | Drive roll set, 37 mm, for aluminium | 092-002771-00016 |
| AL 4R 2.0 MM/0.08 INCH GREY/YELLOW | Drive roll set, 37 mm, for aluminium | 092-002771-00020 |
| AL 4R 2.4 MM/0.095 INCH BROWN/YELLOW | Drive roll set, 37 mm, for aluminium | 092-002771-00024 |
| AL 4R 2.8 MM/0.110 INCH LIGHT GREEN/YELLOW | Drive roll set, 37 mm, for aluminium | 092-002771-00028 |
| AL 4R 3.2 MM/0.125 INCH VIOLET/YELLOW | Drive roll set, 37 mm, for aluminium | 092-002771-00032 |

### 10.1.3 Wire feed rollers for cored wire

| Type | Designation | Item no. |
|---|---|---|
| FUEL 4R 0.8 MM/0.03 INCH WHITE/ORANGE | Drive roll set, 37 mm, 4 rolls, V-groove/knurled for flux cored wire | 092-002848-00008 |
| FUEL 4R 1.0 MM/0.04 INCH BLUE/ORANGE | Drive roll set, 37 mm, 4 rolls, V-groove/knurled for flux cored wire | 092-002848-00010 |
| FUEL 4R 1.2 MM/0.045 INCH RED/ORANGE | Drive roll set, 37 mm, 4 rolls, V-groove/knurled for flux cored wire | 092-002848-00012 |
| FUEL 4R 1.4 MM/0.052 INCH GREEN/ORANGE | Drive roll set, 37 mm, 4 rolls, V-groove/knurled for flux cored wire | 092-002848-00014 |
| FUEL 4R 1.6 MM/0.06 INCH BLACK/ORANGE | Drive roll set, 37 mm, 4 rolls, V-groove/knurled for flux cored wire | 092-002848-00016 |
| FUEL 4R 2.0 MM/0.08 INCH GREY/ORANGE | Drive roll set, 37 mm, 4 rolls, V-groove/knurled for flux cored wire | 092-002848-00020 |
| FUEL 4R 2.4 MM/0.095 INCH BROWN/ORANGE | Drive roll set, 37 mm, 4 rolls, V-groove/knurled for flux cored wire | 092-002848-00024 |

### 10.1.4 Wire guide

| Type | Designation | Item no. |
|---|---|---|
| SET DRAHTFUERUNG | Wire guide set | 092-002774-00000 |
| ON WF 2,0-3,2MM EFEED | Retrofitting option, wire guide for 2.0–3.2 mm wires, eFeed drive | 092-019404-00000 |
| SET IG 4x4 1.6mm BL | Inlet guide set | 092-002780-00000 |
| GUIDE TUBE L105 | Guide tube | 094-006051-00000 |
| CAPTUB L108 D1,6 | Capillary tube | 094-006634-00000 |
| CAPTUB L105 D2,0/2,4 | Capillary tube | 094-021470-00000 |

# 11 Appendix A

## 11.1 Setting instructions

Basic — mm

| mm | mm | SG2/3 G3/4 Si1 Ar-90/$CO_2$-10 M20 m/min | VOLT | SG2/3 G3/4 Si1 $CO_2$-100 / C1 m/min | VOLT | CrNi Ar-98/$CO_2$-2 M12 m/min | VOLT |
|---|---|---|---|---|---|---|---|
| 0,8 | 0,8 | 2,0 | 15,1 | 2,0 | 15,7 | 2,4 | 13,6 |
| | 1,0 | 1,5 | 15,1 | 1,8 | 17,4 | 1,6 | 13,6 |
| 1,0 | 0,8 | 2,6 | 15,4 | 2,7 | 16,3 | 3,0 | 14,5 |
| | 1,0 | 2,2 | 15,4 | 2,1 | 17,8 | 2,2 | 14,2 |
| | 1,2 | 1,2 | 14,4 | 1,6 | 17,8 | 1,5 | 13,6 |
| 2,0 | 0,8 | 5,5 | 17,4 | 4,8 | 19,0 | 6,9 | 18,3 |
| | 1,0 | 4,0 | 18,0 | 3,2 | 18,7 | 4,6 | 17,2 |
| | 1,2 | 3,2 | 17,1 | 2,8 | 18,7 | 3,5 | 16,6 |
| 3,0 | 0,8 | 8,8 | 19,2 | 9,2 | 26,5 | 10,5 | 19,6 |
| | 1,0 | 5,1 | 18,7 | 4,6 | 19,9 | 6,8 | 18,4 |
| | 1,2 | 4,3 | 18,7 | 3,6 | 19,6 | 4,6 | 17,5 |
| 4,0 | 0,8 | 10,8 | 20,8 | 12,0 | 28,9 | 12,8 | 21,4 |
| | 1,0 | 7,0 | 19,8 | 6,3 | 21,7 | 8,4 | 24,0 |
| | 1,2 | 5,0 | 19,8 | 4,9 | 21,7 | 5,8 | 18,0 |
| 5,0 | 0,8 | 14,0 | 21,9 | 14,2 | 30,9 | 14,6 | 24,3 |
| | 1,0 | 8,5 | 21,4 | 8,2 | 27,1 | 9,6 | 25,9 |
| | 1,2 | 6,2 | 20,5 | 6,1 | 24,3 | 6,7 | 19,3 |
| 6,0 | 0,8 | 17,8 | 23,2 | 18,6 | 32,7 | 17,5 | 26,5 |
| | 1,0 | 9,8 | 24,7 | 9,5 | 29,1 | 11,0 | 27,6 |
| | 1,2 | 7,8 | 26,1 | 7,3 | 29,7 | 8,1 | 23,1 |
| 8,0 | 0,8 | 22,0 | 27,1 | 21,8 | 34,8 | 21,0 | 28,8 |
| | 1,0 | 12,0 | 28,8 | 11,6 | 31,8 | 13,5 | 28,8 |
| | 1,2 | 8,5 | 28,0 | 9,1 | 31,8 | 9,5 | 27,5 |
| 10,0 | 1,0 | 14,8 | 30,6 | 14,2 | 34,9 | 15,5 | 30,0 |
| | 1,2 | 9,8 | 29,7 | 11,3 | 33,7 | 11,5 | 28,9 |

Basic — inch

| inch | inch | SG2/3 G3/4 Si1 Ar-90/$CO_2$-10 M20 ipm | VOLT | SG2/3 G3/4 Si1 $CO_2$-100 / C1 ipm | VOLT | CrNi Ar-98/$CO_2$-2 M12 ipm | VOLT |
|---|---|---|---|---|---|---|---|
| .030 | .030 | 080 | 15.1 | 080 | 15.7 | 095 | 13.6 |
| | .040 | 060 | 15.1 | 070 | 17.4 | 065 | 13.6 |
| .040 | .030 | 100 | 15.4 | 105 | 16.3 | 120 | 14.5 |
| | .040 | 085 | 15.4 | 085 | 17.8 | 085 | 14.2 |
| | .045 | 045 | 14.4 | 065 | 17.8 | 060 | 13.6 |
| .080 | .030 | 215 | 17.4 | 190 | 19.0 | 270 | 18.3 |
| | .040 | 155 | 18.0 | 125 | 18.7 | 180 | 17.2 |
| | .045 | 125 | 17.1 | 110 | 18.7 | 140 | 16.6 |
| .120 | .030 | 345 | 19.2 | 360 | 26.5 | 415 | 19.6 |
| | .040 | 200 | 18.7 | 180 | 19.9 | 270 | 18.4 |
| | .045 | 170 | 18.7 | 140 | 19.6 | 180 | 17.5 |
| .155 | .030 | 425 | 20.8 | 470 | 28.9 | 505 | 21.4 |
| | .040 | 275 | 19.8 | 250 | 21.7 | 330 | 24.0 |
| | .045 | 195 | 19.8 | 195 | 21.7 | 230 | 18.0 |
| .195 | .030 | 550 | 21.9 | 560 | 30.9 | 575 | 24.3 |
| | .040 | 335 | 21.4 | 325 | 27.1 | 380 | 25.9 |
| | .045 | 245 | 20.5 | 240 | 24.3 | 265 | 19.3 |
| .235 | .030 | 700 | 23.2 | 730 | 32.7 | 690 | 26.5 |
| | .040 | 385 | 24.7 | 375 | 29.1 | 435 | 27.6 |
| | .045 | 305 | 26.1 | 285 | 29.7 | 320 | 23.1 |
| .315 | .030 | 865 | 27.1 | 860 | 34.8 | 825 | 28.8 |
| | .040 | 470 | 28.8 | 455 | 31.8 | 530 | 28.8 |
| | .045 | 335 | 28.0 | 360 | 31.8 | 375 | 27.5 |
| .395 | .040 | 585 | 30.6 | 560 | 34.9 | 610 | 30.0 |
| | .045 | 385 | 29.7 | 445 | 33.7 | 455 | 28.9 |

*Figure 11-1*

# 12 Appendix B

## 12.1 Overview of EWM branches

### Headquarters

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