FlexTrack 45 PRO

EN

Operating Instructions
Spare Parts List

Carriage

42,0426,0320,EN V12-14022023

Contents

General information 7

About this document ... 9
Function of this document ... 9
Explanation of safety notices ... 9
Qualified personnel ... 9
Copyright ... 9

Safety 11

Operational reliability and tips for the user ... 13
Proper use ... 13
Foreseeable misuse ... 13
Conversions or modifications ... 13
Duty to provide instruction ... 13
Operating Instructions ... 14
Personal protective equipment ... 14
National regulations ... 14
Spare parts, wearing parts and auxiliary materials ... 14
Transportation and storage ... 14

Description of the carriage 15

FlexTrack 45 Pro configurations ... 17
FlexTrack 45 Pro carriage configuration ... 17
FlexTrack 45 Pro rail configuration ... 18
FlexTrack 45 Pro ring rail configuration ... 18
Ring rail configuration according to work piece diameter ... 19

Carriage components ... 20
Structure of the carriage ... 20
Remote controls ... 20

Options and accessories ... 21
Radial oscillation unit ... 21
FMS slide ... 21
Trailer for wirefeeder ... 21
Mechanical seam tracking ... 22

Controls and connections ... 23
Connections ... 23
Control box ... 23
Control box control elements ... 24
Connections ... 24
Carriage ... 24
Carriage control elements ... 25

Welding position and weld seam tracking ... 26
Welding positions ... 26
Oscillating motion ... 27

Commissioning 29

Preparing the carriage ... 31
Mounting the carriage with a linear oscillation unit ... 31
Mounting the carriage with a linear oscillation unit and FMS slide ... 32
Replacing oscillation unit with adjustment unit ... 33
Assembly of FMS slide on the adjustment unit ... 34
Mounting the radial oscillation unit ... 35
Mounting the mechanical seam tracking ... 36

Preparing and installing guide rails 38
Fittings 38
Number of bridges required 38
Bridge types 39
Installing the bridges 40
Straight guide rails 41
Installing the actuating cams 41
Securing the rail structure 42
Rigid ring segments 42
Mounting on the component 43
Flexible ring segments 44
Ring segments with a defined radius 44
Vacuum rails - operating elements 46
Mounting vacuum rails 47
Securing vacuum rails 51
Removing vacuum rails 52

Commissioning the carriage 53
Placing the carriage on a straight guide rail 53
Placing the carriage on a circular guide rail 53
Disengaging the carriage 54
Setting the mechanical seam tracking (if used) 55

Operation **56**

Connecting to the TPS power source 58
Configuration 58
CANopen 58
Image modes 58
Setting the NODE address (BASIC and PRO remote Control) 58
Starting sequence 58

Connecting to the TPSi power source 59
Configuration 59
CANopen 59
Image modes 59
Setting the NODE address: Remote control BASIC 59
Setting the NODE address: Remote control PRO 60
Starting sequence 60

FRC-45 Basic remote control 61
Safety 61
FRC-45 Basic control elements 61
Define parameters for the carriage 63
Selecting additional functions 64
Saving a program 65
Loading the welding program 66
Changing the 67
units of measurement 67

FRC-45 Pro remote control 68
Safety 68
FRC-45 Pro control elements 68
Touch display 70

Standard software functions 71
Selecting a menu 71
Select a welding parameter 71
Editing parameters 71
Saving parameters 72

Service menu 73
Assigning function keys 73
Selecting power source 74

Loading welding program 75
Saving welding program 76
Selecting the language 76
Changing the units of measurement 78

Menu description 79
CARRIAGE menu 79
OSC menu 80
ACC menu 80
PS menu (Power Source) 81
ORBITAL menu 81

ACC function 82
General 82
Activating the ACC function: 82
FRC-45 Basic remote control 82
Activating the ACC function: 83
FRC-45 Pro remote control 83
ACC parameter 84

ORBITAL function 85
General 85
Activating ORBITAL function:
FRC-45 Basic remote control 85
Activating ORBITAL function:
FRC-45 Pro remote control 86
Orbital parameters 87
Segment parameters 89

Starting welding: FRC-45 Basic 90
Switching on system components 90
Working with or without an oscillation unit 90
Performing a test run 90
Starting the welding process 91

Starting welding: FRC-45 Pro 92
Switching on system components 92
Working with or without an oscillation unit 92
Performing a test run 92
Starting the welding process 93

Maintenance and disposal **94**

Troubleshooting 96
General 96
Basic requirements for the system to work 96
Event codes 96
Remote control 96
FRC-45 Basic 96
FRC-45 Pro remote control event codes 96
Error code display 97
Error codes 97

Maintenance 99
Maintenance personnel 99
Maintenance record 99
Recommended lubricants 99
Maintenance intervals and procedures 100
Adjusting the gear rack play 103

Technical data **104**

Technical data 106
FlexTrack 45 PRO Carriage 106
Control box 106

FRC-45 Basic and FRC-45 Pro ... 106
Linear oscillation unit ... 106
Radial oscillation unit ... 106
FMS 100/ML15/SE/ACC (optional) ... 107
FMS 50/ML15/SE/ACC (optional) ... 107
Environmental conditions ... 107
Noise data ... 107
Dimensions ... 108
FMS slide dimensions ... 109
Weights of rails and bridges ... 109
Rating plates ... 110
Ring rail settings table ... 111
Flexible rail segments settings table ... 112

Spare parts, Circuit Diagram **114**

Spare parts ... 116
Spare parts, wearing parts and auxiliary materials ... 116
Details required when placing orders ... 116
Carriage and accessories: ... 117
Connection cable: ... 117
Rails, bridges and ring rails for variable workpiece diameters: ... 118
Ring rail for defined workpiece diameters: ... 118
FlexTrack 45 Carriage Pro ... 119
FRC-45 Pro remote control ... 121
FRC-45 Basic remote control ... 122
FGU 8/SD80-28 ... 123
FGU 9 / SD28 ... 123
FOU 30 / ML 10 / linear ... 124
FOU 30 / ML6 / radial ... 125
FMS 100/ML15/SE/ACC ... 126
FMS 50/ML15/SE/ACC ... 127
Mechanical seam tracking ... 128
FTH 18/D16-25 ... 129
FTH 21 ... 129
Closed ring rail ... 130
Straight guide rails (rigid and flexible) ... 130
Vacuum bridge ... 131
Vacuum bridge with spacer block ... 132
Vacuum bridge with adjustment unit ... 133
Setting gauge ... 134
Wiring diagram ... 135
Declaration of conformity ... 141

General information

About this document

Function of this document

These Operating Instructions explain how to commission and operate the device in conjunction with the installed system components. Look after the Operating Instructions carefully; they must always be to hand at the location where the device is being used. They can be used as a reference should any operational or functional problems occur in the future.

Explanation of safety notices

DANGER!

Indicates a hazard with a high level of risk which, if not avoided, will result in death or serious injury.

WARNING!

Indicates a hazard with a medium level of risk which, if not avoided, may result in death or serious injury.

CAUTION!

Indicates a hazard with a low level of risk which, if not avoided, may result in minor or moderate injury.

NOTICE!

Indicates a potentially hazardous situation which, if not avoided, may result in damage to the machine, equipment or workpiece.

IMPORTANT! Indicates tips for correct operation and other particularly useful information. This does not indicate a potentially hazardous situation.

Special care is required if you see any of the symbols shown.

Qualified personnel

- These Operating Instructions are designed for trained personnel or persons with practical welding experience. Personnel must be trained through verifiable regular instruction.
- Maintenance and repair of the device may likewise only be carried out by trained technicians and in compliance with the specified maintenance activities and maintenance intervals.
- The manufacturer accepts no liability for damage caused by insufficient knowledge of how to use the device.

Copyright

Safety

Operational reliability and tips for the user

Proper use

The carriage must only be used for welding butt and fillet welds in a horizontal or vertical welding position.
Any other use shall be deemed improper and the manufacturer will assume no responsibility for any damages arising.

The carriage can be used in the following welding processes:
- MIG/MAG process
- CMT process

Proper use also includes:
- Carrying out all maintenance work at the specified maintenance intervals
- Keeping a service book with the necessary information (date, operator, activities carried out, etc.)
- Using the spare parts stipulated by Fronius
- Following all the instructions, particularly the safety instructions, in the Operating Instructions
- Using this document in conjunction with the Operating Instructions for the integrated system components (power source, etc.)

Foreseeable misuse

Any use other than for the intended purpose shall be deemed improper use. This includes:

- Riding on the carriage, transporting loads
- Using the flexible (non-reinforced) rails on level surfaces
- Use above head height
- Hoisting processes (hoisting, manoeuvring of loads, animals or persons)
- Use as an aid to climbing
- Use as a tool shelf
- Use outside of the permitted technical operating limits (e.g. exceeding the max. permitted load)
- Use in hazardous areas

Conversions or modifications

Any unauthorised conversions or modifications made to the carriage by the user shall invalidate all liability or warranty obligations on the part of the manufacturer!
The electromagnetic characteristics of the carriage can be adversely affected by additions or modifications of any kind. No modifications or upgrades should therefore be undertaken without first consulting the manufacturer and obtaining written approval.

Duty to provide instruction

Before they start work, the system operator must instruct or train all persons working with the carriage in the following:
- Theoretical and practical aspects of operation
- Safety regulations

IMPORTANT! The duty to instruct also applies in particular to those who only occasionally work with the carriage. (e.g. during set-up, maintenance, etc.)

Operating Instructions

The Operating Instructions help you to use the carriage safely and efficiently, and must therefore be to hand at all times.

- Keep the various sections of the Operating Instructions at the location where the carriage is being used at all times.
- Clearly mark the place where the instructions are kept.
- Ensure that all persons working with the carriage know where the Operating Instructions are located.
- The Operating Instructions will only be able to help you in the event of a problem if they are at hand!

IMPORTANT! The manufacturer shall not be liable for any damage that arises from failure to observe the Operating Instructions!

Personal protective equipment

The operator alone is responsible for the immediate working environment.
The following safety measures must be put in place and employed:

 - Welding shield

 - Safety helmet

 - Welding gloves

 - Welding apparel

 - Safety footwear

IMPORTANT! Do not wear loose clothing and prevent long hair from being trapped when carrying out work on or using the carriage!
Risk of injury due to snagging or pulling in of clothes or hair.

National regulations

In some countries, local statutory regulations may apply that are not included in these Operating Instructions. It is the duty of the operator to be aware of and comply with any local statutory regulations. This relates primarily to regulations concerning:

- Accident prevention
- Machine safety
- Protection of personnel (protective equipment)
- Environmental protection
- Electrical system

Spare parts, wearing parts and auxiliary materials

Using spare parts and wearing parts from third-party manufacturers may pose risks. Use approved Fronius original spare parts only.
The manufacturer cannot accept any liability for damage resulting from the use of spare or wearing parts or auxiliary materials that are not approved by the manufacturer.

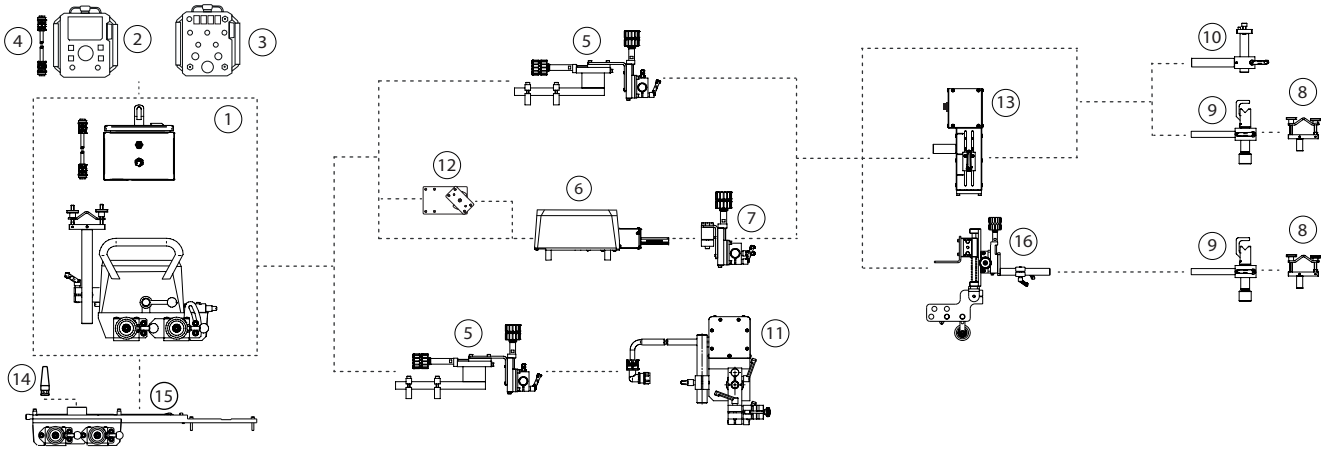
Transportation and storage

The complete system, including tool kit, is supplied in a specially designed transport box.
The rails must be stored separately.

Description of the carriage

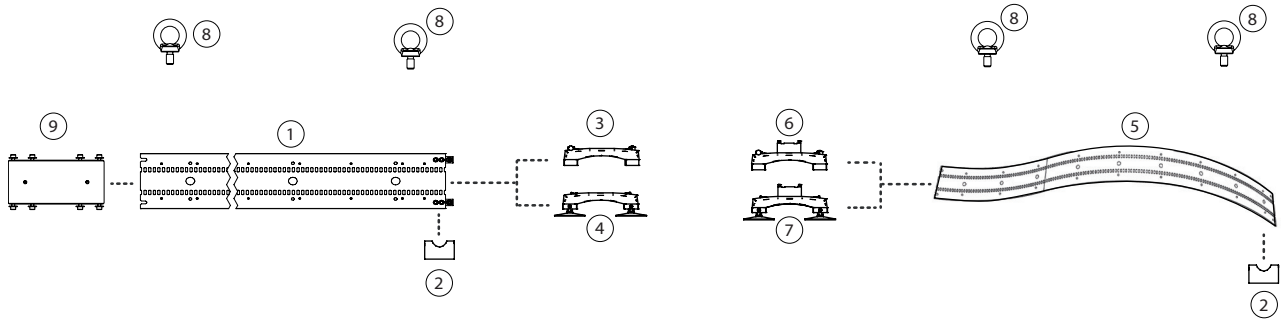
FlexTrack 45 Pro configurations

FlexTrack 45 Pro carriage configuration



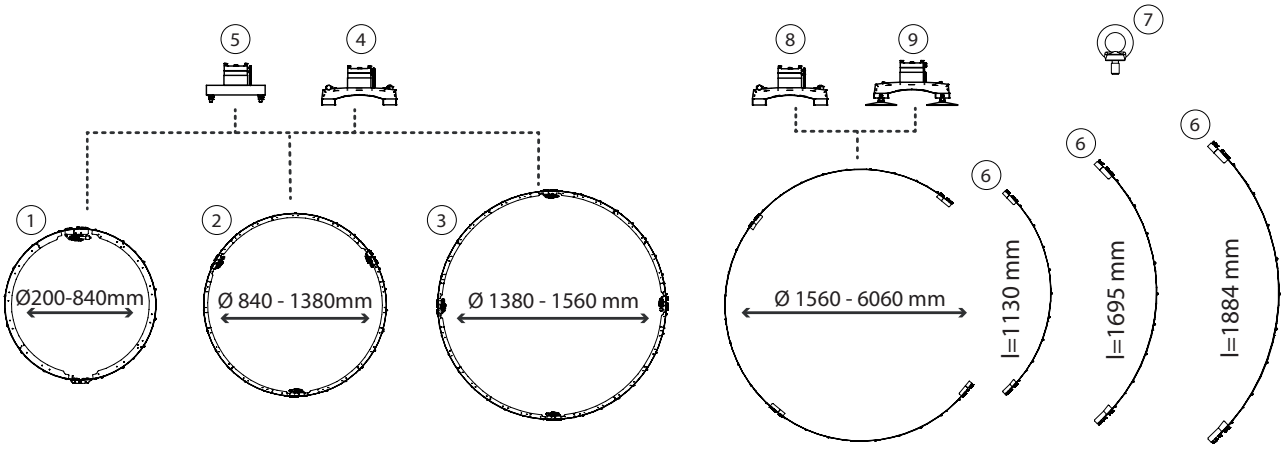
(1)	FlexTrack 45 Pro carriage, including: - Control box with mains cable, (3 m) - Control box connection cable (10 m) - Power source connection cable, 9-pin plug (10 m) - Torch hosepack holder - Transport box - Tool kit
(2)	FRC-45 Pro remote control (without cable)
(3)	FRC-45 Basic remote control (without cable)
(4)	FRC-45 remote control cable (10 m)
(5)	FGU 8 adjustment unit
(6)	FOU 30 / ML10 linear oscillation unit
(7)	FGU 9 vertical adjustment unit
(8)	FTH 19 additional torch holder
(9)	FTH 18 torch holder
(10)	FTH 21 torch holder
(11)	FOU 30 / ML6 radial oscillation unit
(12)	Swivel adapter +/-45° for FOU 30 linear oscillation unit
(13)	FMS 100/ML15/SE/ACC
(14)	VR MW mounting lug
(15)	Trailer for FlexTrack wirefeeder
(16)	FST 95 seam tracking with FGU 9 angle bracket

FlexTrack 45 Pro rail configuration



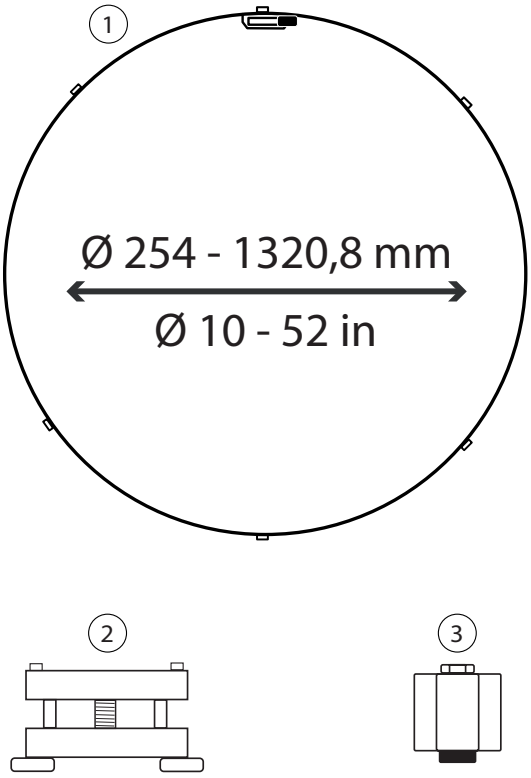
(1)	Straight rail
(2)	I-kit actuating cam rail (2 units are required)
(3)	Magnetic bridge with two manually operated permanent magnets
(4)	Vacuum bridge with two suction cups
(5)	Flexible rail
(6)	Magnetic bridge with two manually operated permanent magnets
(7)	Vacuum bridge with two suction cups
(8)	Eye bolt incl. locknut for securing load
(9)	Rail connector for the stable connection of straight rails

FlexTrack 45 Pro ring rail configuration



(1)	Rigid ring rail, Ø 200-300 mm / 300-480 mm / 480-660 mm / 660-840 mm
(2)	Rigid ring rail, Ø 840-1020 mm / 1020-1200 mm / 1200-1380 mm / 1380-1380 mm
(3)	Rigid ring rail, Ø 1380-1560 mm
(4)	Adjustable magnetic bridge with two manually operated permanent magnets
(5)	Adjustable screw feet bridge, adjustment unit with metric scale and distance block
(6)	Flexible rail, 1130 mm / 1695 mm / 1884 mm
(7)	Eye bolt incl. locknut for securing load
(8)	Adjustable magnetic bridge
(9)	Adjustable vacuum bridge

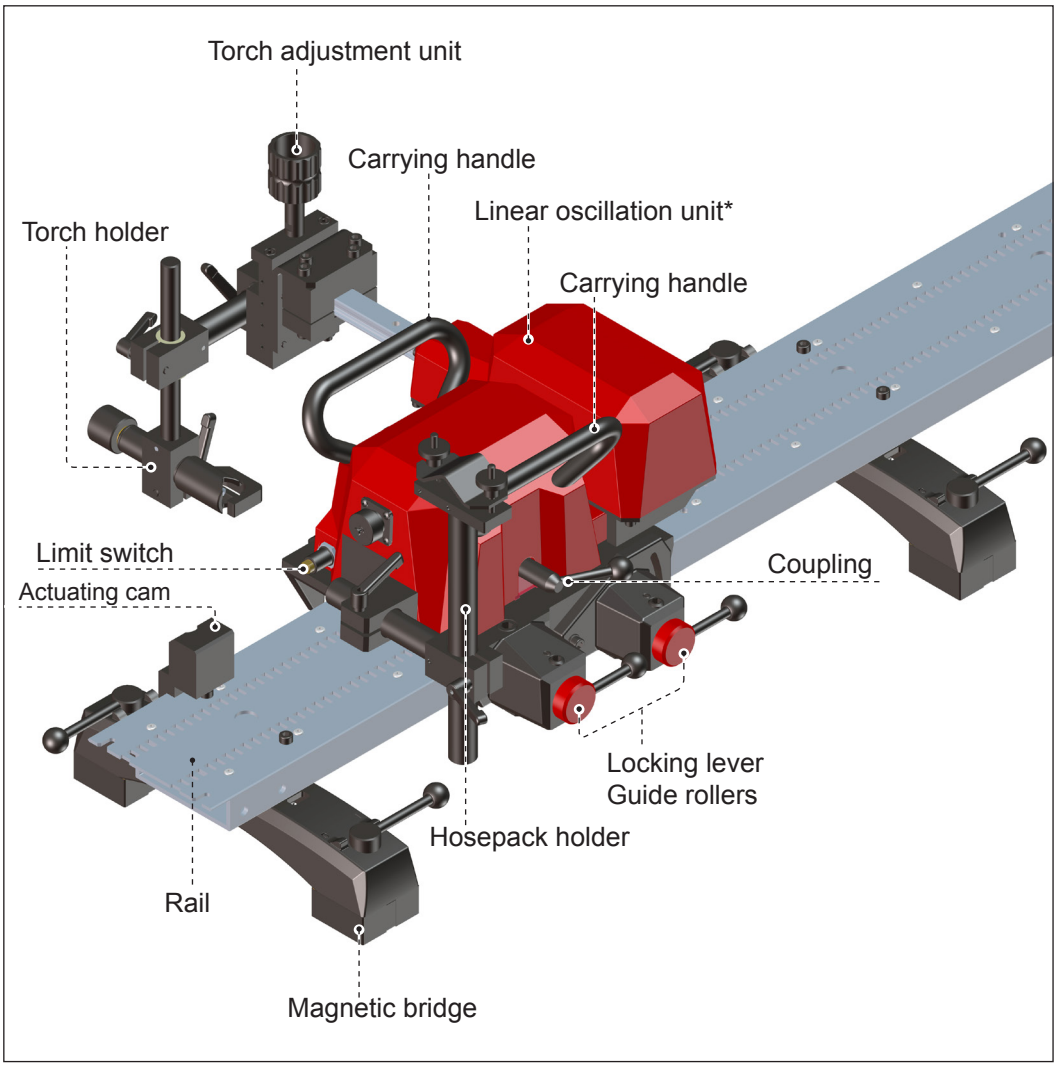
Ring rail configuration according to work piece diameter



(1) Ring rail
(2) Magnetic bridge
(3) Spring holder

Carriage components

Structure of the carriage



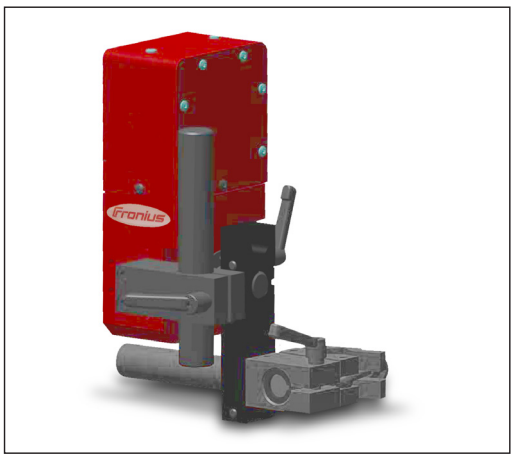
* The radial oscillation unit or the FGU 8 adjustment unit can also be fitted as an option.

Remote controls

FRC-45 Basic	FRC-45 Pro
	

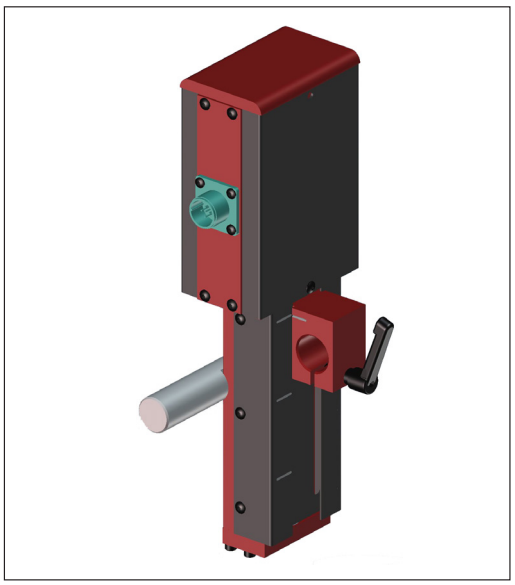
Options and accessories

Radial oscillation unit



The radial oscillation unit can be mounted on the left or the right of the carriage.
Item no.: 8,045,590

FMS slide



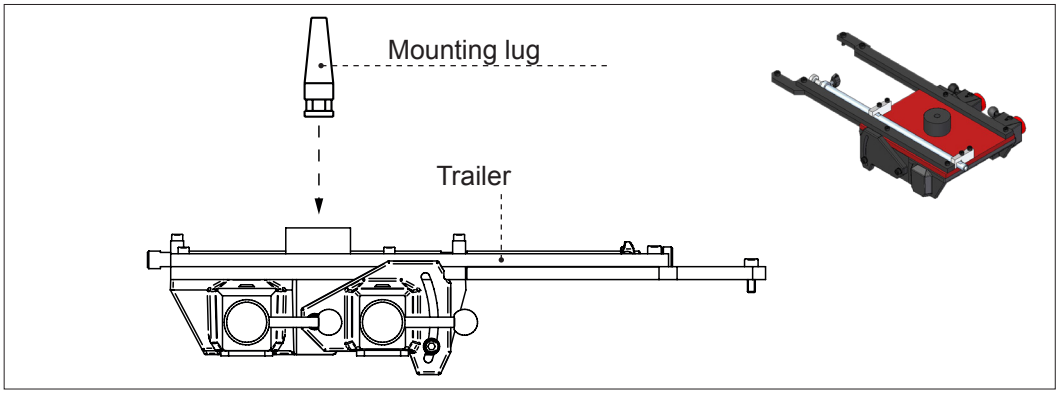
The FMS slide is available in two versions:
- FMS 100/ML15/SE/ACC
  Item no. 8,045,599
- FMS 50/ML15/SE/ACC
  Item no. 8,045,618

It can be used on the carriage without an oscillation unit, or in conjunction with the linear oscillation unit.
It is used for automatic adjustment of the distance between the welding torch and the workpiece.

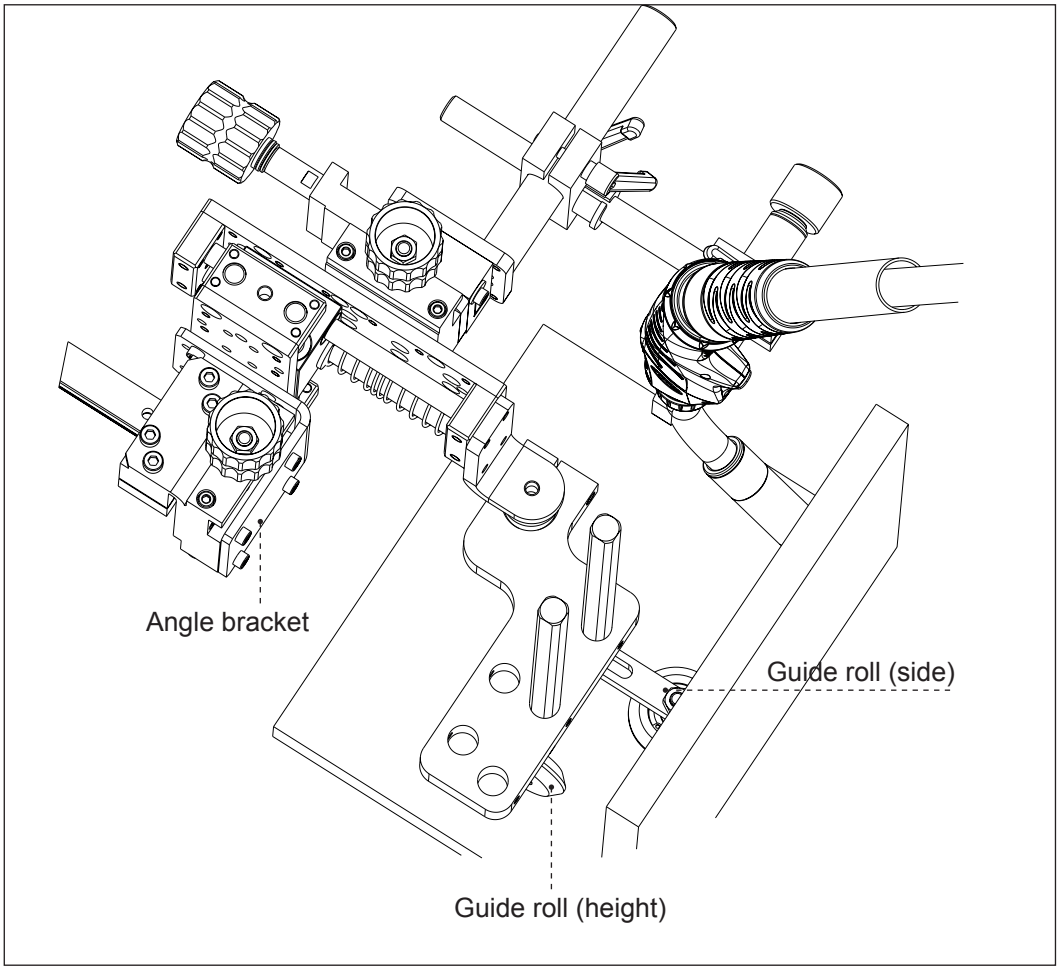
Trailer for wirefeeder

Trailer for VR 4000, VR 5000 or WF 25i wirefeeder: Item no.: 48,0005,2599
Mounting lug: Item no.: 42,0001,3752

IMPORTANT! Only suitable for use with rigid rails in the PA position - magnetic bridge/ vacuum bridge in horizontal position!



Mechanical seam tracking

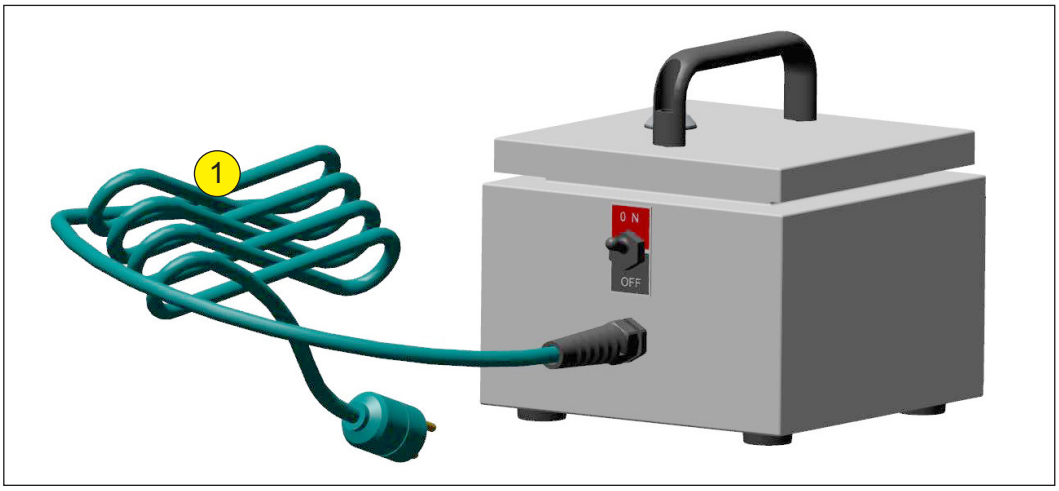


The mechanical seam tracking can be used with a linear oscillation unit as well as with the FGU 8 adjustment unit.

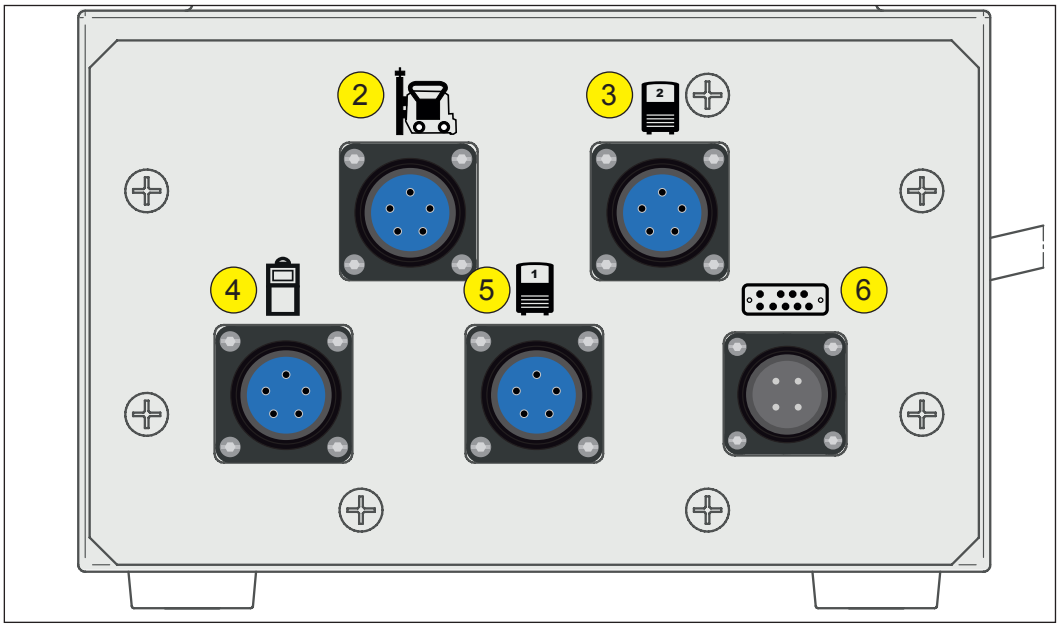
Use with linear oscillation unit: mount above additional FGU 9 adjustment unit; linear oscillation unit serves as an adjustment slide.
Use with adjustment unit: mount directly to the FGU 8 adjustment unit.

Controls and connections

Connections Control box



(1)	Control box mains cable



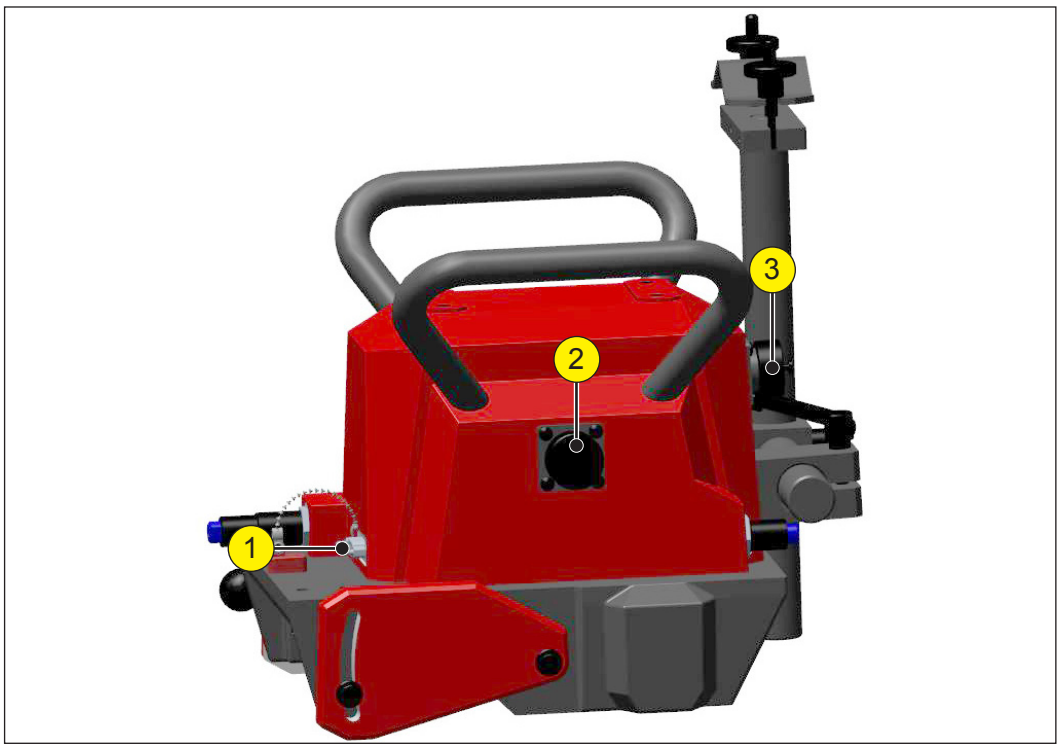
(2)	Connection for control line between carriage and control box
(3)	Connection for connection cable between control box and power source 2 with CAN communication
(4)	Connection for control line between control box and remote control
(5)	Connection for connection cable between control box and power source 1 with CAN communication
(6)	Connection for the connection cable between the control box and power source without CAN communication

Control box control elements

(1) ON/OFF switch

Switches the control box on and off

Connections Carriage

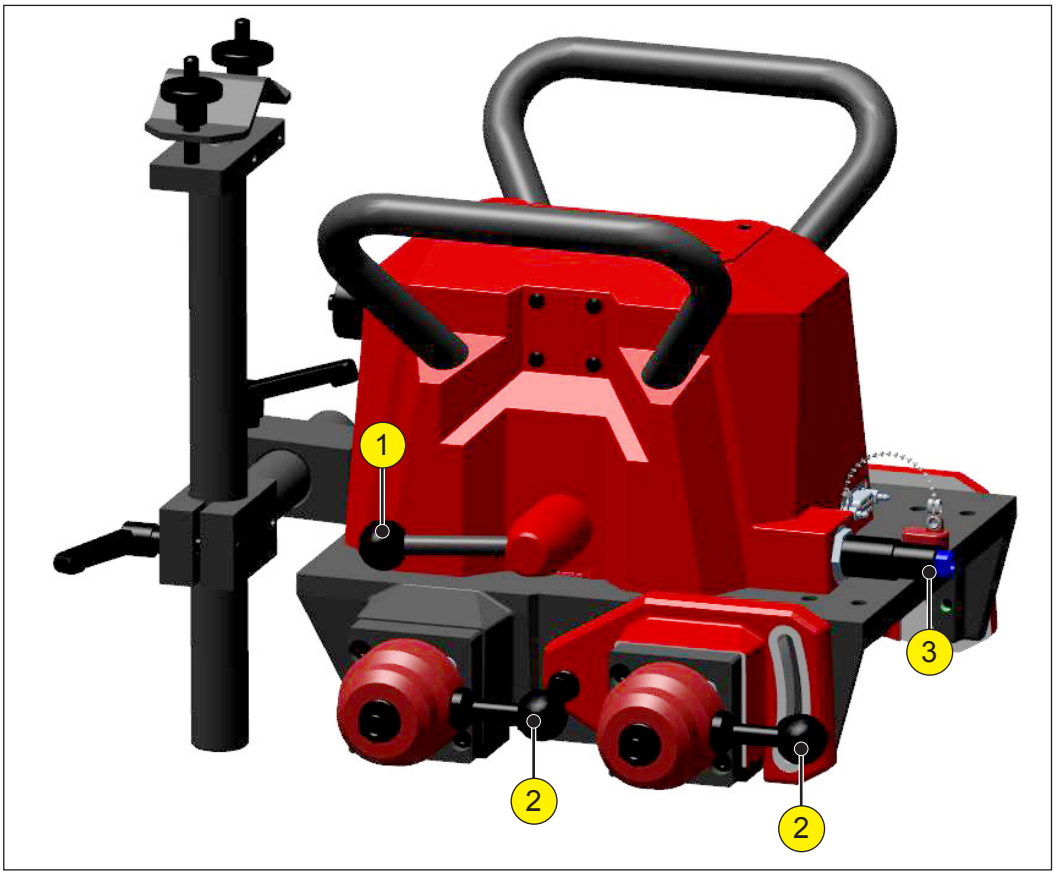


(1) Connection for linear oscillation unit

(2) Connection for FMS 50 or FMS 100, or radial oscillation unit

(3) Connection for control line between carriage and control box

Carriage control elements



(1)	**Coupling on/off**
	Locks/unlocks the carriage drive unit on the rail. Allows rapid positioning of the carriage.
(2)	**Guide rollers locking lever**
	Fixes and releases the internal guide rollers.
(3)	**Limit switch (both sides, in and against direction of travel)**
	For automatic stopping or changing of direction.

IMPORTANT! A detailed description of the FRC-45 Basic and FRC-45 Pro remote controls can be found in the OPERATION section.

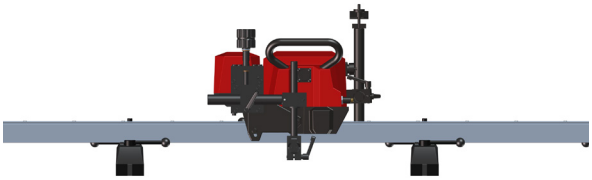
Welding position and weld seam tracking

Welding positions

NOTICE!

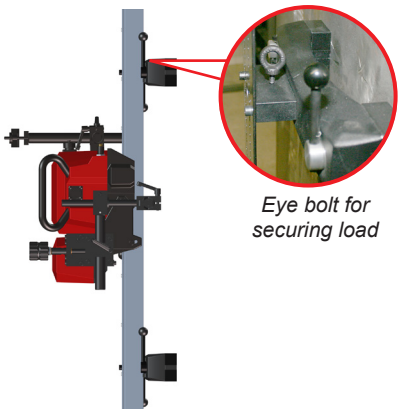
In vertical applications, the rail structure must be secured by a load arrestor with a locking function to prevent it from falling. The load arrestor must be designed for the total weight of the carriage and rail structure. The manufacturer accepts no liability for any damage to persons or property resulting from vertical use of the carriage without a load arrestor.

Horizontal position on rigid rail:



Possible welding positions:
- PA (flat position)
- PB (horizontal-vertical position)
- PC (horizontal position)

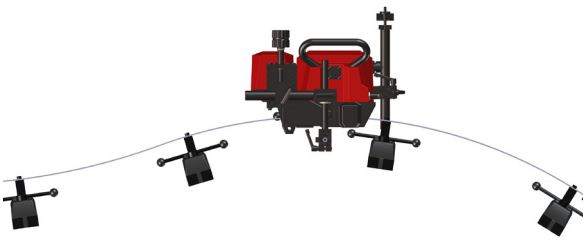
Vertical position on rigid rail:



Eye bolt for securing load

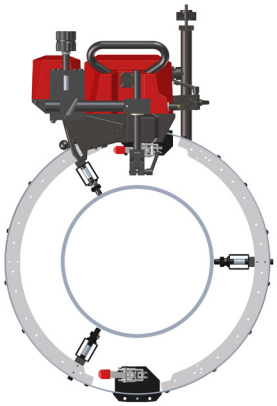
Possible welding positions:
- PG (descending position)
- PF (ascending position)

Position on flexible rail:



Possible welding positions:
- PA (flat position)
- PB (horizontal-vertical position)
- PC (horizontal position)
  PG (descending position)
- PF (ascending position)

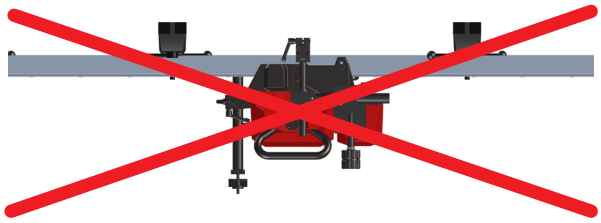
Position on ring rail (rigid or flexible)



Possible welding positions:
- PA (flat position)
- PB (horizontal-vertical position)
- PC (horizontal position)
  PG (descending position)
- PF (ascending position)

Welding positions (continued)

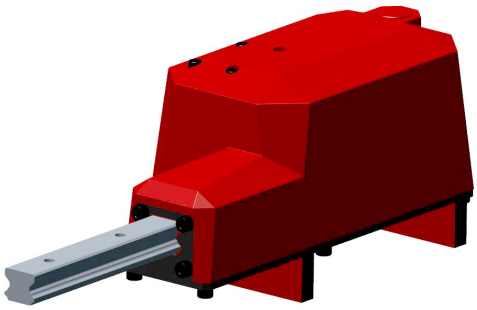
Overhead position



The carriage is NOT suitable for the PE and PD positions (overhead / horizontal-overhead). Use in this manner shall be deemed improper!

Oscillating motion

Linear oscillation unit



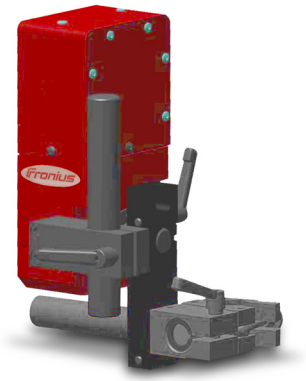
None
Oscillating motion

Rectangular

Trapezoidal

Triangular

Radial oscillation unit



None
Oscillating motion

Rectangular

Trapezoidal

Triangular

Fillet weld

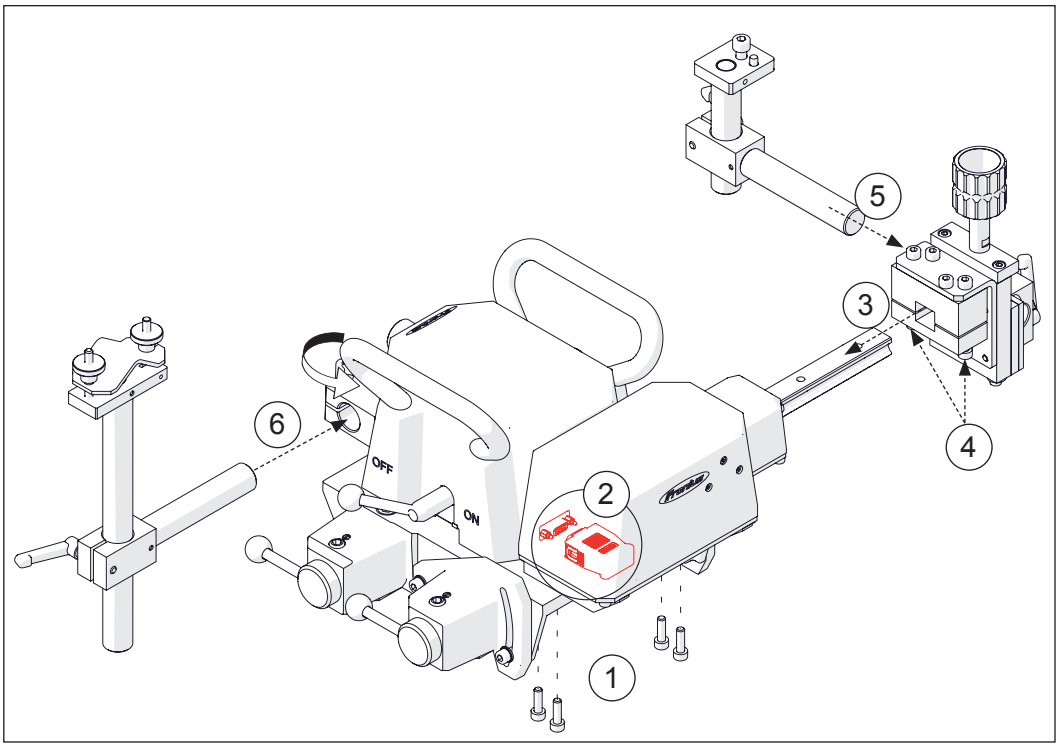
Commissioning

Preparing the carriage

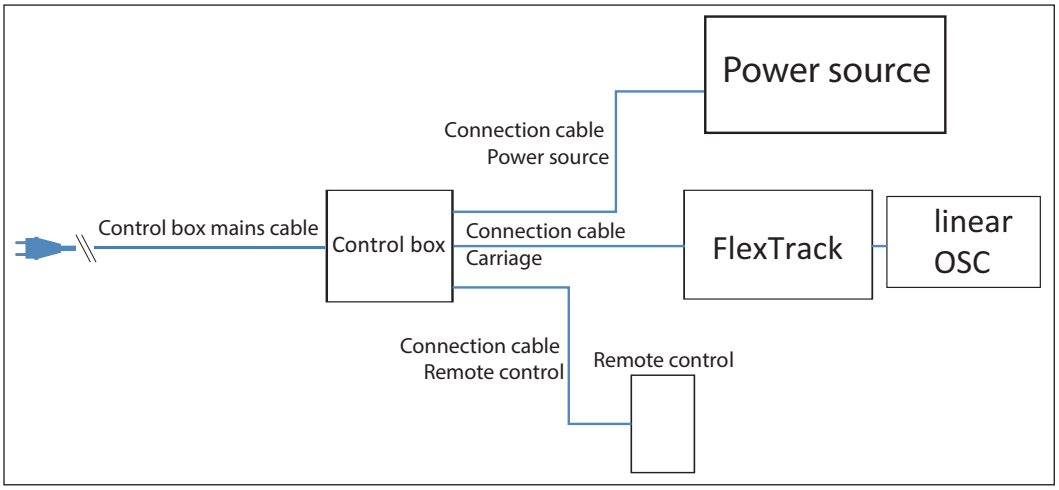
Mounting the carriage with a linear oscillation unit

Mounting the carriage with a linear oscillation unit:

1. Connect the oscillation unit to the carriage using the six screws supplied.
2. Connect the connecting lead for the oscillation unit to the carriage and lock it in place.
3. Push the torch holder onto the oscillation unit.
4. Tighten the screws.
5. Fit the horizontal support onto the torch holder and tighten the screws.
6. Feed in the hosepack holder and fix it in place with the clamp lever.



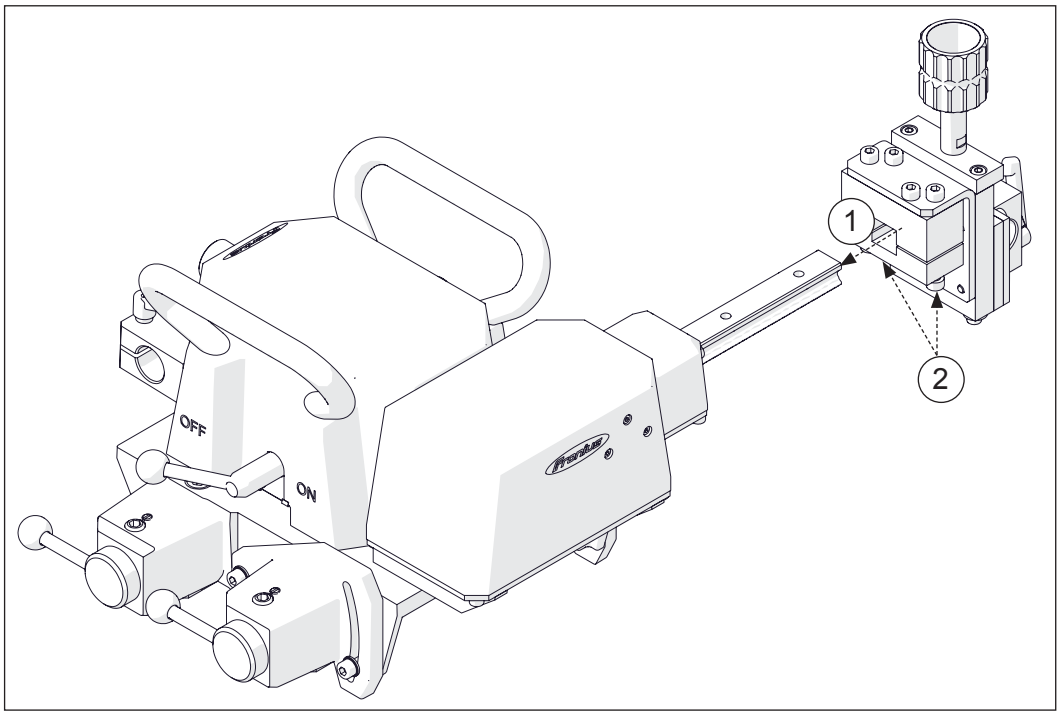
7. Establish the connections: see diagram below



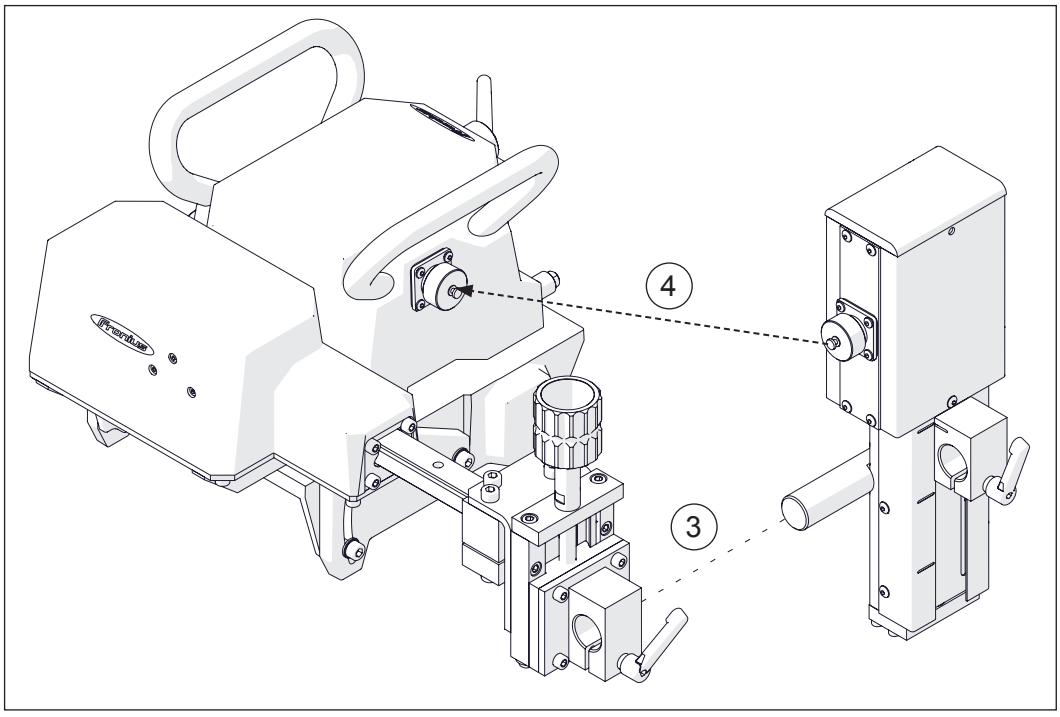
Mounting the carriage with a linear oscillation unit and FMS slide

Mounting the carriage with a linear oscillation unit and FMS slide:

1. Push the torch holder onto the oscillation unit.
2. Tighten the screws.

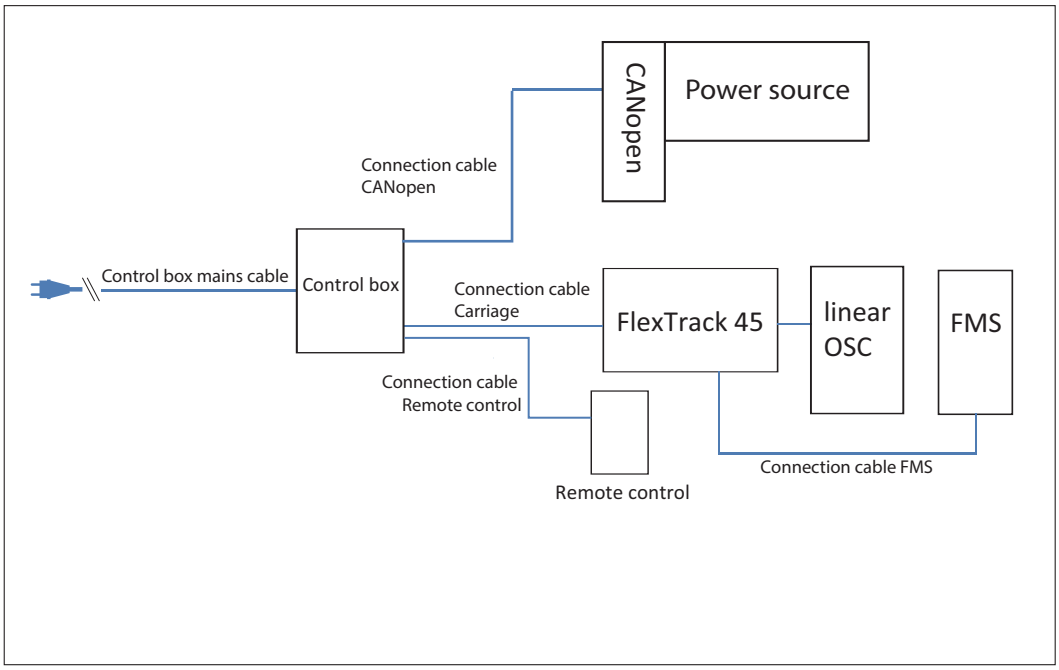


3. Secure the FMS slide on the torch holder and close the clamping lever.
4. Connect the connection cable for the FMS slide to the carriage.



Mounting the carriage with a linear oscillation unit and FMS slide
(continued)

5. Establish the connections: see diagram below.

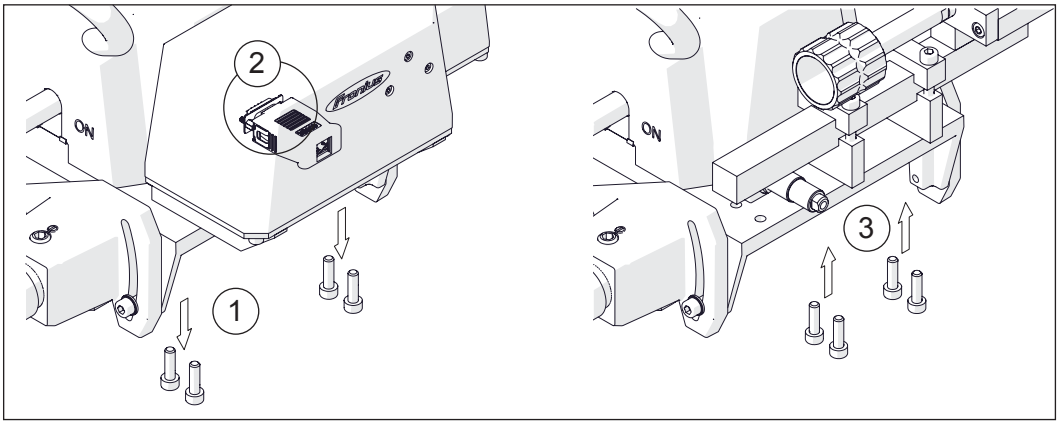


Replacing oscillation unit with adjustment unit

Replacing the linear oscillation unit with an adjustment unit:

1. Undo the six M6 screws and remove the oscillation unit.
2. Disconnect the connecting lead for the oscillation unit from the carriage.
   Place the protective cap onto the socket for the oscillation unit.
3. Fasten the adjustment unit to the welding carriage using four M6 screws.

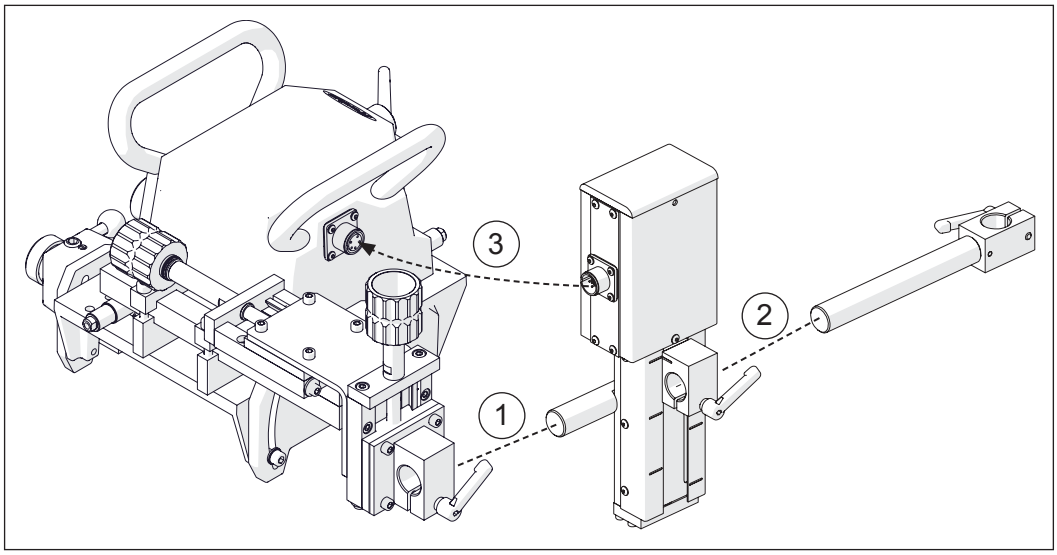
IMPORTANT! Reverse this sequence when replacing the adjustment unit with the oscillation unit.



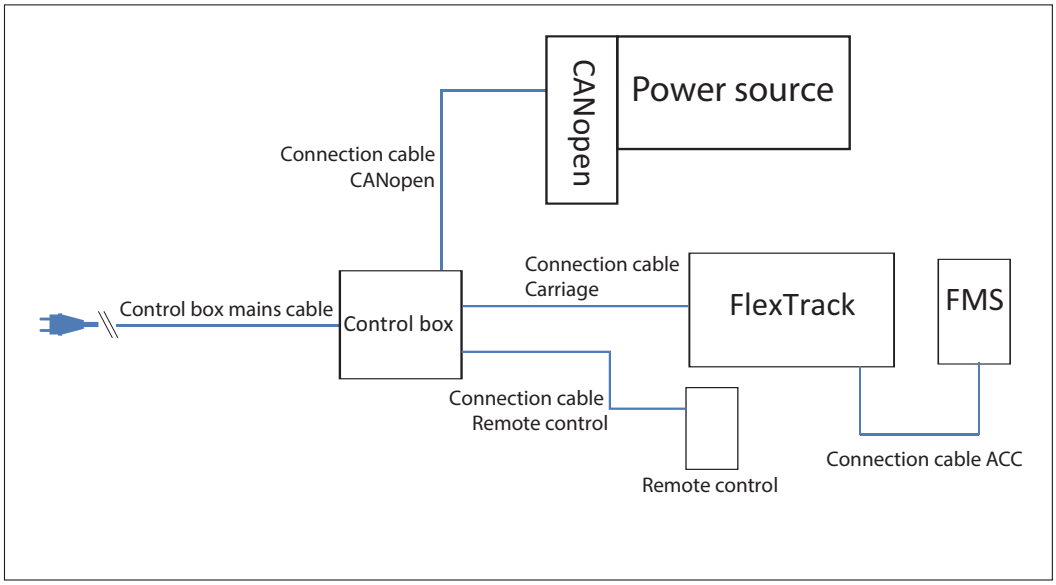
Assembly of FMS slide on the adjustment unit

Mounting the FMS slide on the adjustment unit:

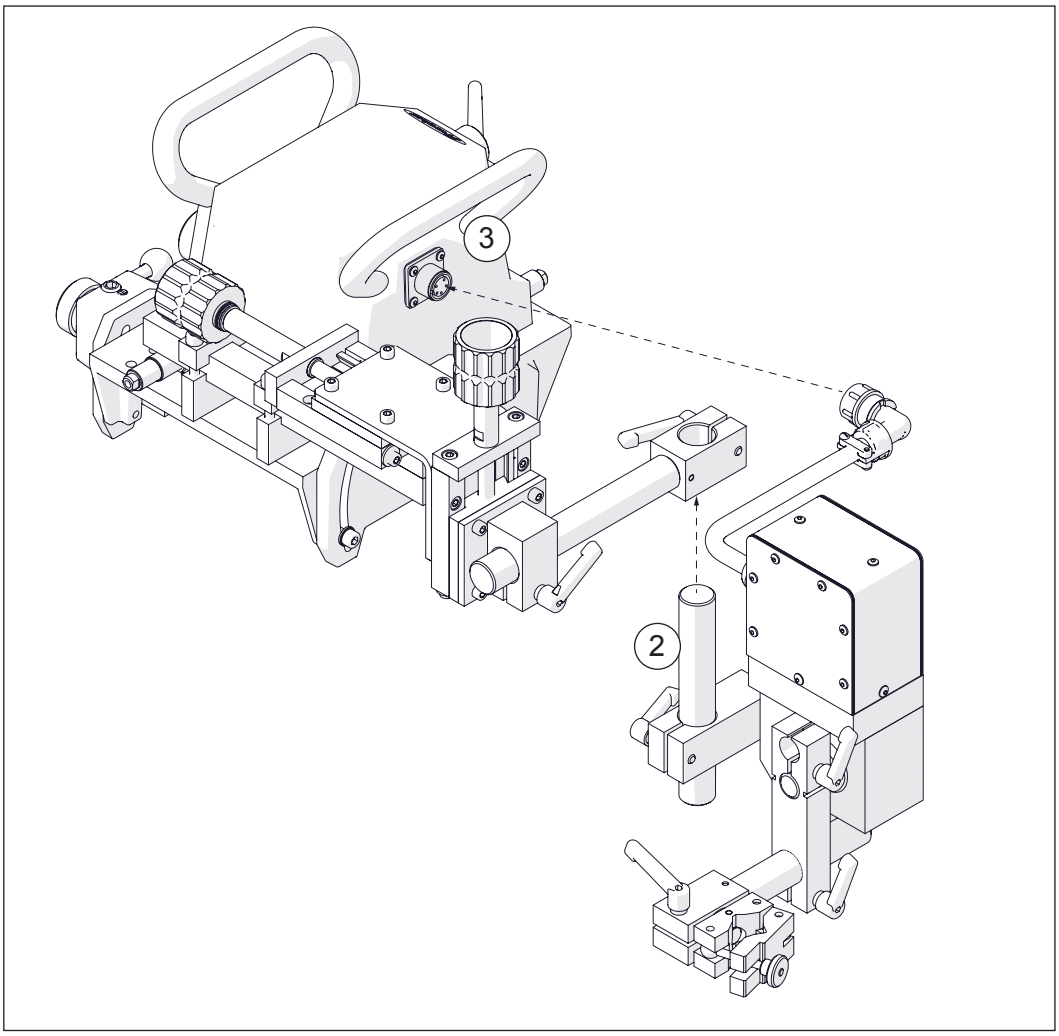
1. Position the FMS slide on the adjustment unit and close the clamping lever.
2. Attach the torch holder to the FMS slide and close the clamping lever.
3. Plug the FMS connection cable into the oscillation unit socket.



4. Establish the connections: see diagram below.

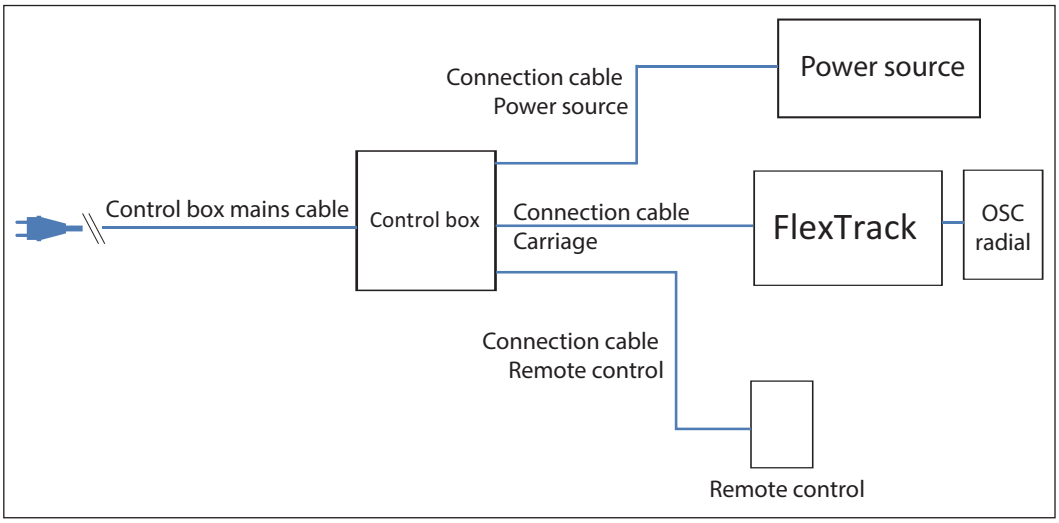


Mounting the radial oscillation unit



Mounting the radial oscillation unit onto the adjustment unit:

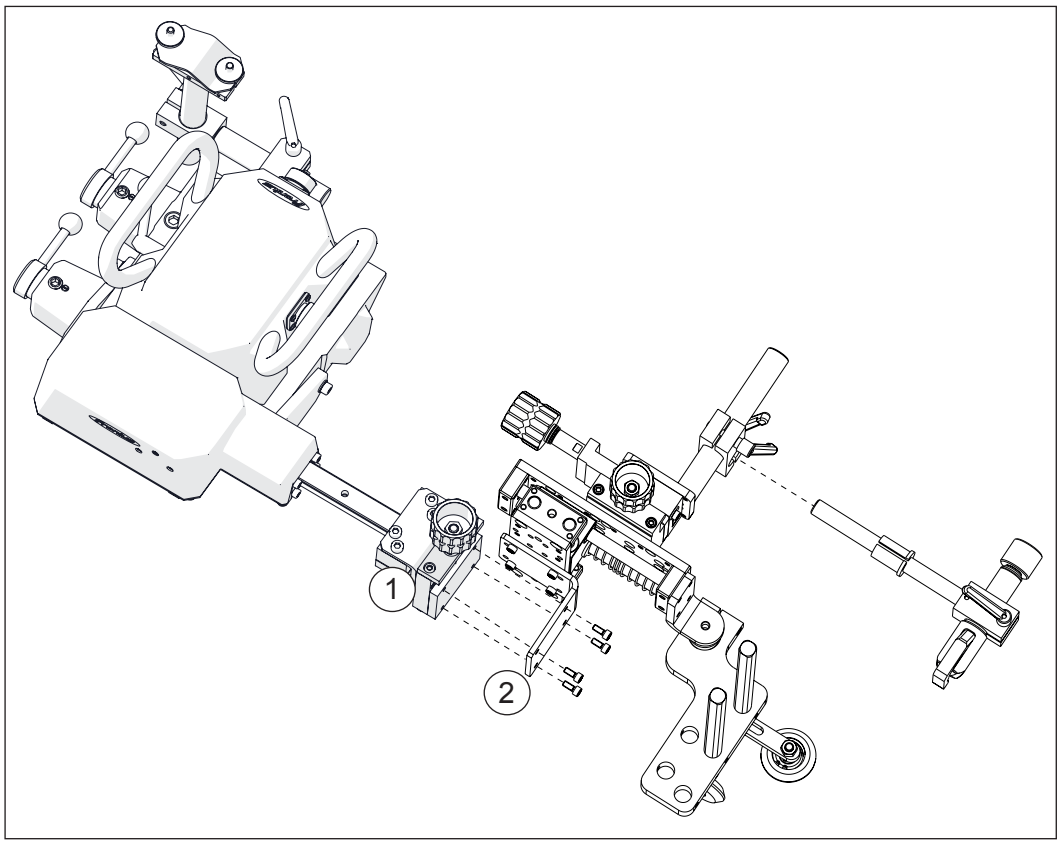
1. Mount the adjustment unit as described under "Replacing oscillation unit with adjustment unit"
2. Push the vertical bolt into the horizontal holder and secure using the clamping lever.
3. Connect the connecting lead for the oscillation unit to the carriage and lock it in place.
4. Establish the connections: see diagram below.



Mounting the mechanical seam tracking

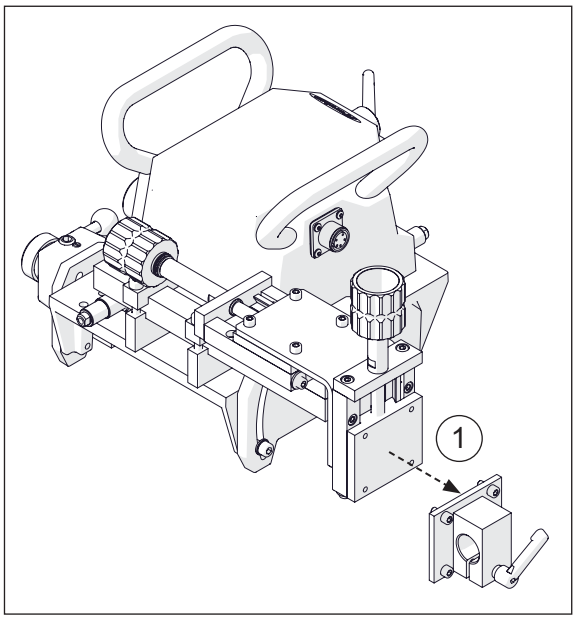
Mounting the mechanical seam tracking onto the linear oscillation unit:

1. Mount the FGU 9 adjustment unit onto the linear oscillation unit.
2. Fit the mechanical seam tracking adjustable bracket to the FGU 9 adjustment unit using the four screws.



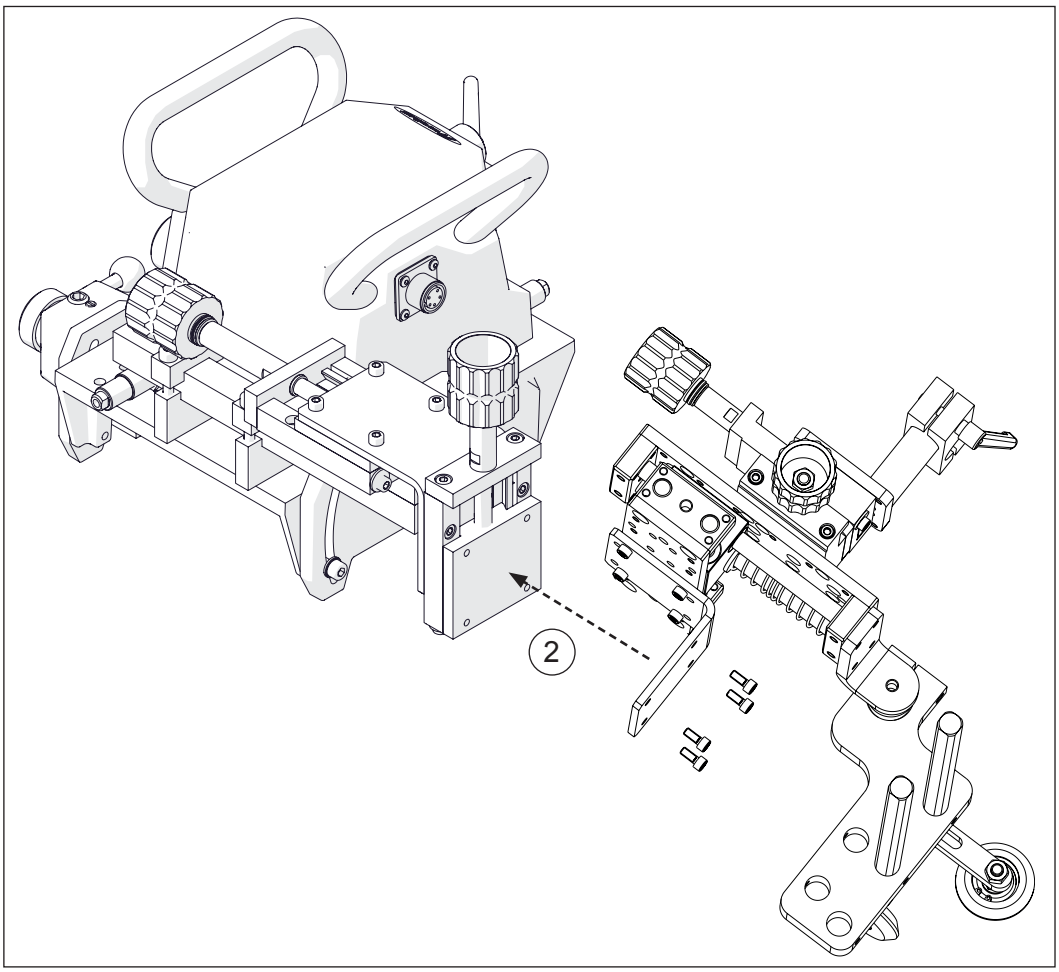
Mounting the mechanical seam tracking onto the adjustment unit:

1. Remove the plate using the clamping lever.



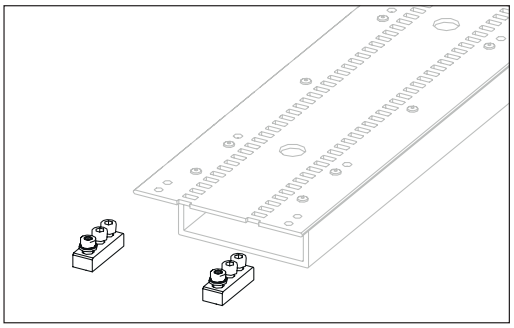
Mounting the mechanical seam tracking
(continued)

2. Fit the mechanical seam tracking adjustable bracket to the FGU 8 adjustment unit using the four screws.

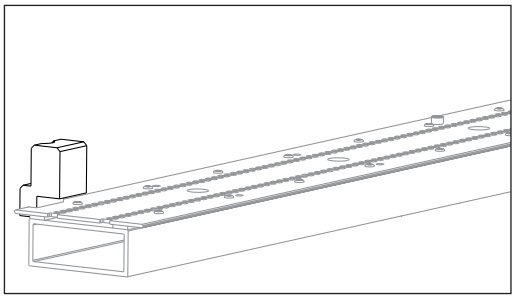


Preparing and installing guide rails

Fittings



Connection pieces:
Two connection pieces to extend the rails are included with every rail.

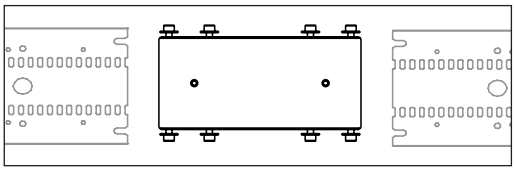


Actuating cam installation kit:

Two actuating cams to trigger the limit switch at the beginning and end of the guide rail.

NOTICE!

If actuating cams are not used, there is a risk that the carriage might travel beyond the end of the rail and fall off.



Rail connector:
For the stable connection of straight rails.

Number of bridges required

IMPORTANT! The specified number of bridges is applicable when using magnetic bridges as well as when using vacuum bridges.

Straight, rigid rails:

- ► For a rail length of 1884 mm: use 3 bridges.

Straight, flexible rails:

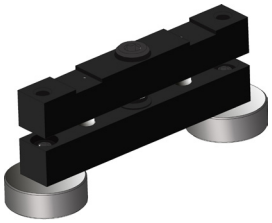
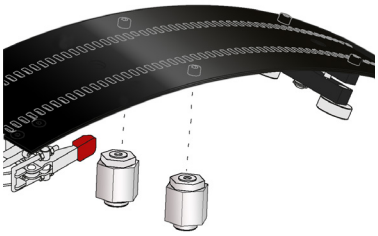
- ► For a rail length of 1884 mm: use 5 bridges.
- ► For a rail length of 1695.6 mm: use 4 bridges.
- ► For a rail length of 1130.4 mm: use 3 bridges.

Closed ring rails and ring rails made from rail segments:

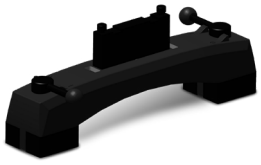
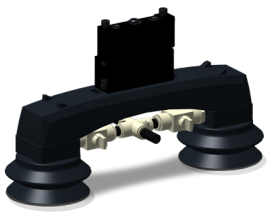
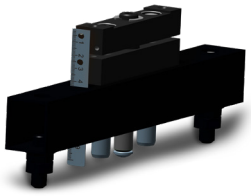
- ► The number of bridges required depends on the ring diameter and should be taken from the settings table.

Bridge types

For ring segments with a fixed radius

MAGNETIC BRIDGE	SPRING SUPPORT
	
Magnetic bridges for ring segments with a fixed radius for mounting on ferritic components. Height adjustment: 10 mm (0.39 inch).	Spring pressure spacer for ring segments with a fixed radius. Can also be used with non-ferritic components.

For flexible and rigid rails and closed ring rails

MAGNETIC BRIDGE	VACUUM BRIDGE	SCREW FEET BRIDGE
		
For ferritic components. Heat-resistant up to 180°C. The magnetic force is controlled by a lever. Maximum holding force of a magnetic bridge: 750 N	Components with smooth surfaces, such as aluminium or stainless steel. Operating temperature: 0°C to 120°C (optional from -30°C to 250°C).	For rigid rings up to 840 mm (33 inch) in diameter.

NOTICE!

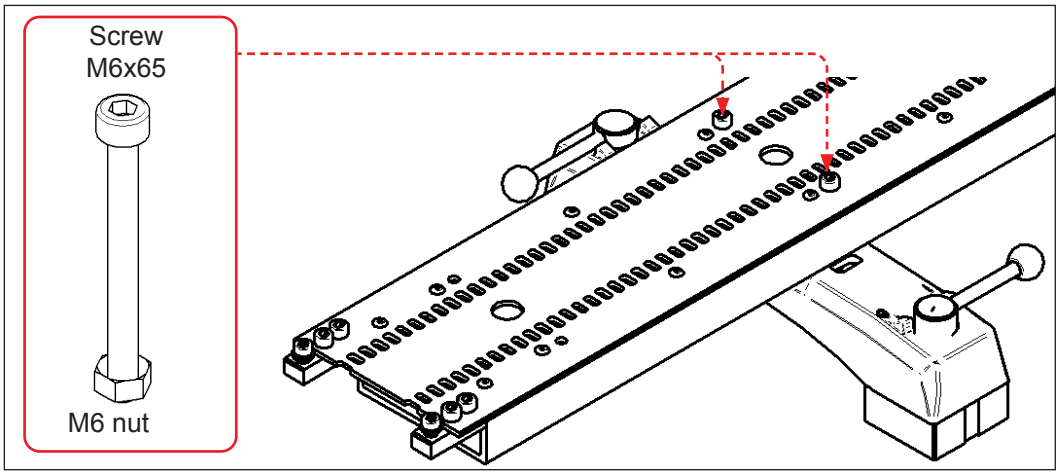
Take care when welding preheated components. As additional heat is generated during the welding process, take extra care to avoid exceeding the temperature required to maintain the holding force of the magnets.

IMPORTANT! All bridges include a metric adjustment unit and a spacer.

Installing the bridges

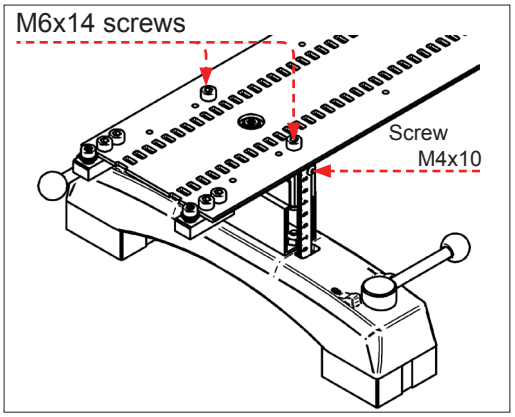
Bridge without spacer and adjustment unit:

Fit the rail to the bridge using the two M6x65 screws and counter them using the two M6 nuts.
IMPORTANT! The mounting positions for the bridges are marked: in the middle of the rail there is a recess for the adjustment unit adjusting screw.



Bridge with adjustment unit:

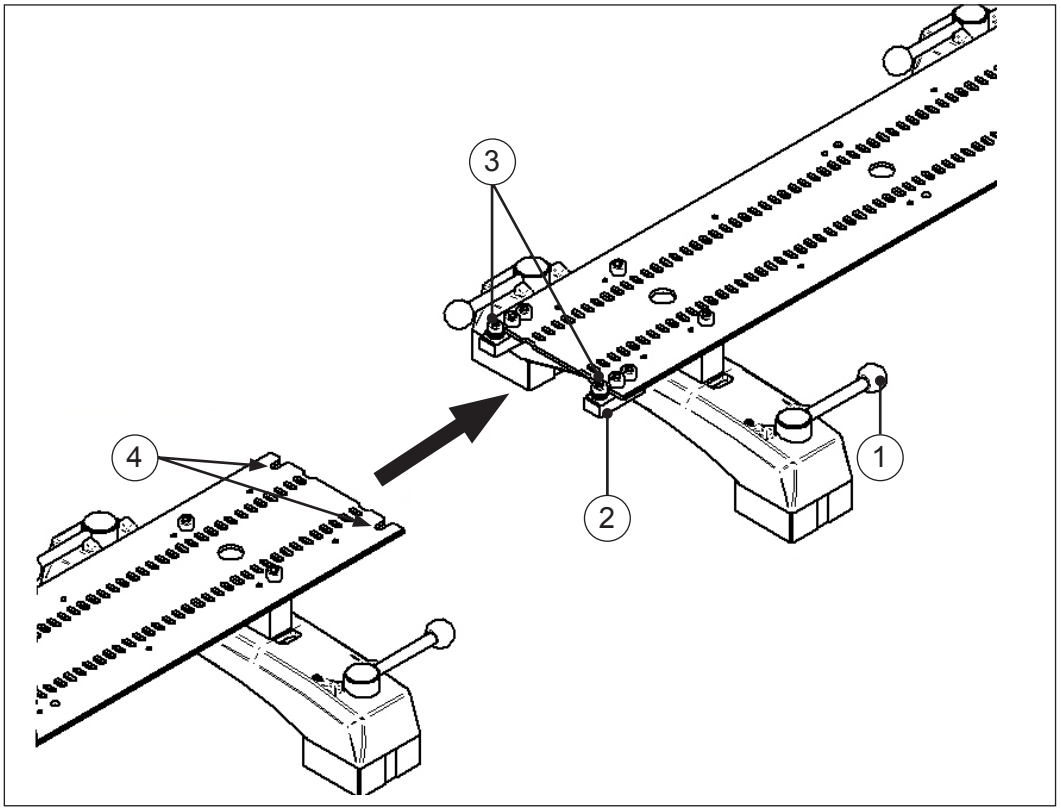
Bridges with an adjustment unit are installed using the M6x14 screws supplied.



The scale on the side of the adjustment unit is fixed in place using the M4x10 screw supplied.

Straight guide rails

Both rigid and flexible straight guide rails can easily be extended using the joining elements supplied.



1. Set the levers on the magnetic bridges (1) to OFF.
2. Place the rail section on the workpiece and set the levers on the magnetic bridges to ON.
3. Fit the joining element (2) at the end of the straight rail.
4. Loosen both M6 screws (3).
5. On the next section of rail, set the levers on the magnetic bridges to OFF.
6. Push the next section of rail with the groove (4) between the joining element (2) and the screw (3).
7. Tighten both M6 screws (3).
8. Align the rail if necessary, then set the levers on the magnetic bridges to ON.
9. Install further rail sections as described above until the rail has reached the required length.
10. Install an actuating cam for the limit switch at the beginning and end of the rail.

Installing the actuating cams

IMPORTANT! If actuating cams are not used, there is a risk that the carriage might travel beyond the end of the rail and fall off!

In rail structures with open ends (not rings), actuating cams (limit switch installation kit) must be installed at both ends.

Securing the rail structure

IMPORTANT! In vertical applications, the rail structure must be secured by a load arrestor with a locking function to prevent it from falling.
The load arrestor must be designed for the total weight of the carriage and rail structure. The manufacturer accepts no liability for any damage to persons or property resulting from vertical use of the carriage without a load arrestor.

NOTICE!

Ensure that the cable on the load arrestor is kept permanently taut. Check the load arrestor for damage before use.

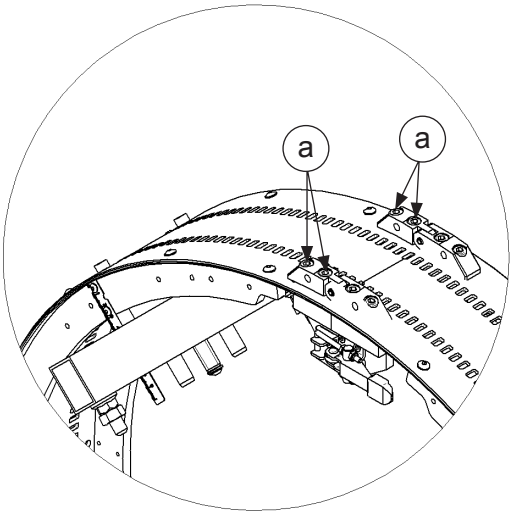
Rigid ring segments

Rigid ring segments can be joined to create ring rails with a maximum diameter of 1560 mm (4 segments). The individual segments are joined to form a ring rail using locking catches and M6x20 socket screws.

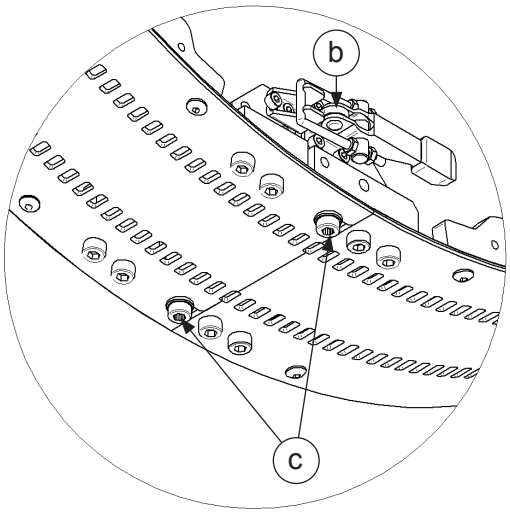
The number of segments used and the bridges required for different pipe diameters are set out in the table below:

Diameter	Segments	Bridges
200 - 300 mm (7.9 - 11.8 in.)	2	3
300 - 480 mm (11.8 - 18.9 in.)	2	4
480 - 660 mm (18.9 - 26 in.)	2	6
660 - 840 mm (26 - 33.1 in.)	2	8
840 - 1020 mm (33.1 - 40.2 in.)	3	9
1020 - 1200 mm (40.2 - 47.2 in.)	3	12
1200 - 1380 mm (47.2 - 54.3 in.)	3	15
1380 - 1560 mm (54.3 - 61.4 in.)	4	16

1. Join two ring segments. Tighten the top four M6x20 screws (a) slightly.

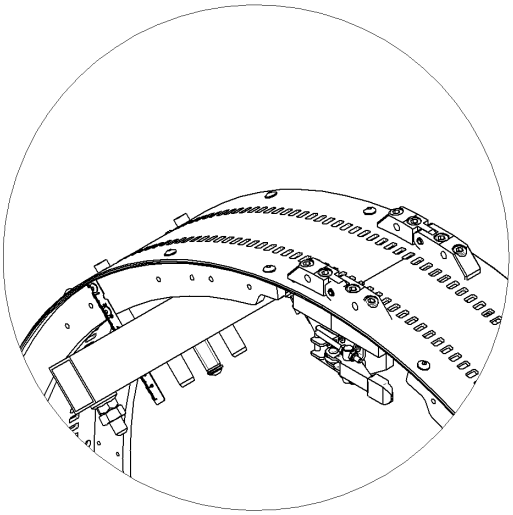


2. Lock the locking hook (b) on the lower guide section.
Tighten the two lower M6x16 screws (c) slightly.

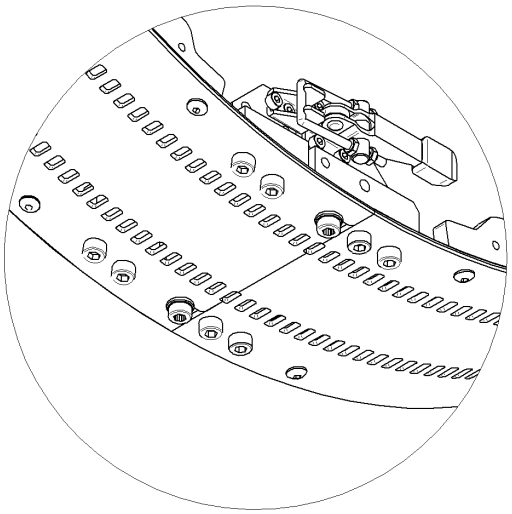


Rigid ring segments
(continued)

3. Engage the upper locking hook (d).

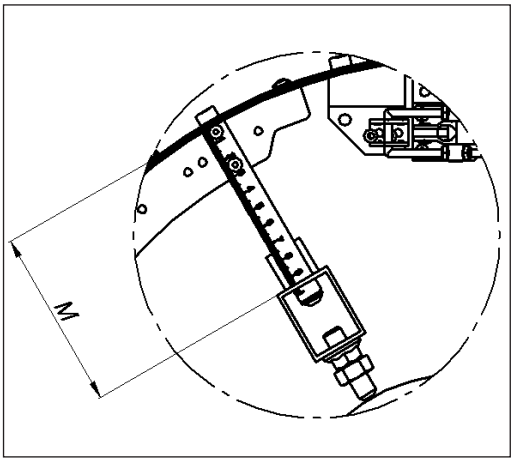


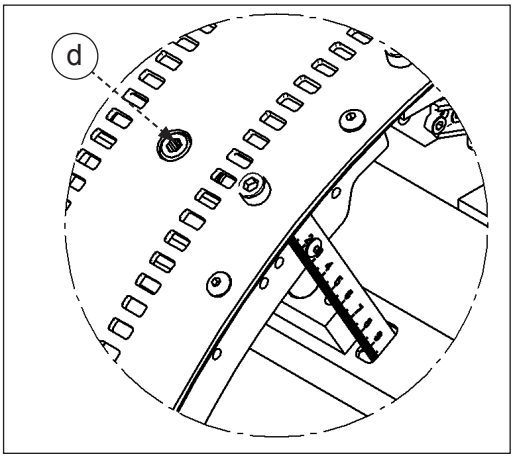
4. If necessary, align the two segments with one another.
Tighten all the M6 screws (4 at the top, 2 at the bottom).



Mounting on the component

1. It is recommended that two people should work together when installing a ring rail made from rail segments.
2. When using magnetic bridges: Set the lever on the bridges to OFF.
3. Use the adjusting screw (d) to set the clearance on the adjustment units of the bridges. For the recommended setting M, please refer to the settings table. When installing the rings, set them initially to 3 mm more than is shown in the table on the adjustment unit.





4. Install the ring rail on the component.
5. Using the adjusting screws (d) on the bridges, fit the ring rail evenly around the component.
6. When using magnetic bridges: set all the levers on the magnetic bridges to ON.

Flexible ring segments

Flexible ring segments can be joined to create ring rails with a diameter of 1560 mm to 6060 mm (up to 11 segments).

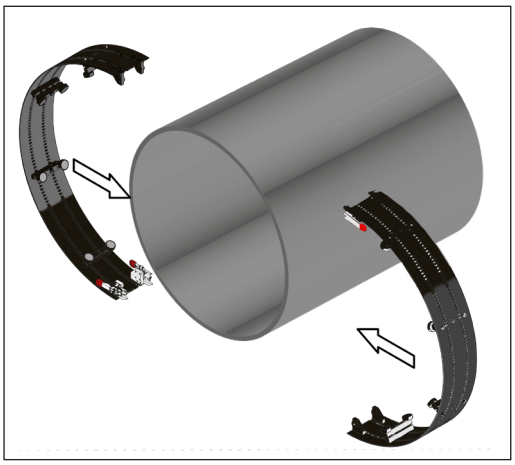
The individual segments are joined to form a ring rail using M6x20 socket screws. Flexible segments are available in the following lengths:

SEGMENT TYPE	LENGTH
Type I	1130.4 mm
Type II	1695.6 mm
Type III	1884 mm

The number of segments and bridges used depends on the pipe diameter and can be selected using the table below:

Diameter	Segments	Bridges
1560 - 1740 mm (61.4 - 68.5 in.)	3x type I 1x type II	18
1740 - 1920 mm (68.5 - 75.6 in.)	3x type III 1x type I	18
1920 - 2100 mm (75.6 - 82.7 in.)	3x type III 1x type II	20
2100 - 2280 mm (82.7 - 89.8 in.)	3x type III 2x type I	21
2280 - 2460 mm (89.8 - 95.9 in.)	5x type II	25
2460 - 2640 mm (95.9 - 103.9 in.)	3x type III 2x type II	25
2640 - 2820 mm (103.9 - 111 in.)	5x type II 1x type I	25
2820 - 3000 mm (111 - 118.1 in.)	6x type II	28
3000 - 3180 mm (118.1 - 125.2 in.)	3x type III 3x type II	30
3180 - 3360 mm (125.2 - 132.3 in.)	6 x type III	30
3360 - 6060 mm (132.3 - 238.6 in.)	On request	

Ring segments with a defined radius



These ring rails are designed for fixed workpiece diameters. Suitable for orbital welding applications with an external pipe diameter ranging from 254 - 1778 mm (10 - 70 inch).

Especially easy and fast to attach to the component due to pre-contoured rail segments with pre-fitted bridge elements and quick-clamping system.

Ring segments with a defined radius
(continued)

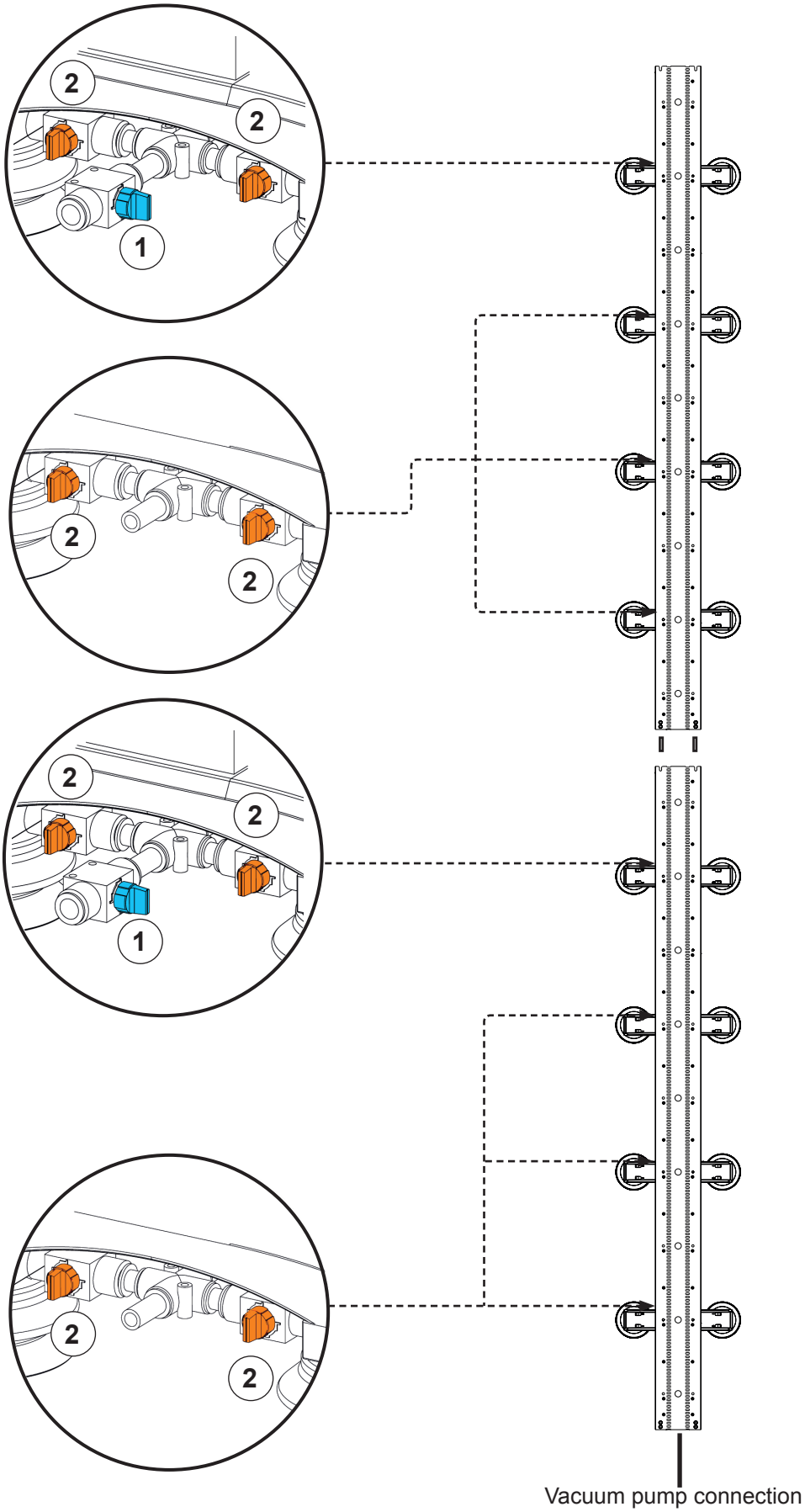
The number of bridges required can be found in the following table:

Diameter	Magnetic bridges	Spring pressure spacer
254,0 mm (10 in)	4	8
304,8 mm (12 in)	6	12
355,6 mm (14 in)	6	12
406,4 mm (16 in)	6	12
457,2 mm (18 in)	6	12
508,0 mm (20 in)	8	16
558,8 mm (22 in)	8	16
609,6 mm (24 in)	8	16
660,4 mm (26 in)	8	16
711,2 mm (28 in)	10	20
762,0 mm (30 in)	10	20
812,8 mm (32 in)	10	20
863,6 mm (34 in)	10	20
914,4 mm (36 in)	12	24
965,2 mm (38 in)	12	24
1016,0 mm (40 in)	12	24
1066,8 mm (42 in)	15	30
1117,6 mm (44 in)	15	30
1168,4 mm (46 in)	15	30
1219,2 mm (48 in)	15	30
1270,0 mm (50 in)	15	30
1320,8 mm (52 in)	15	30
1371,6 mm (54 in)	16	32
1422,4 mm (56 in)	16	32
1473,2 mm (58 in)	20	40
1524,0 mm (60 in)	20	40
1574,8 mm (62 in)	20	40
1625,6 mm (64 in)	20	40
1676,4 mm (66 in)	20	40
1727,2 mm (68 in)	20	40
1778,0 mm (70 in)	20	40

Vacuum rails - operating elements

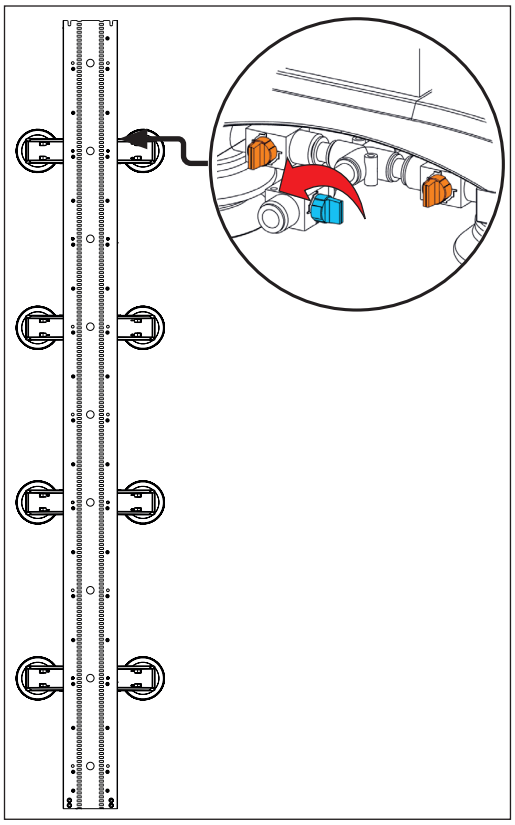
1 Vacuum line shut-off valve

2 Vacuum suction cup shut-off valves

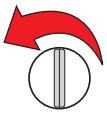


Mounting vacuum rails

IMPORTANT! At least two persons are required to install the rail system.

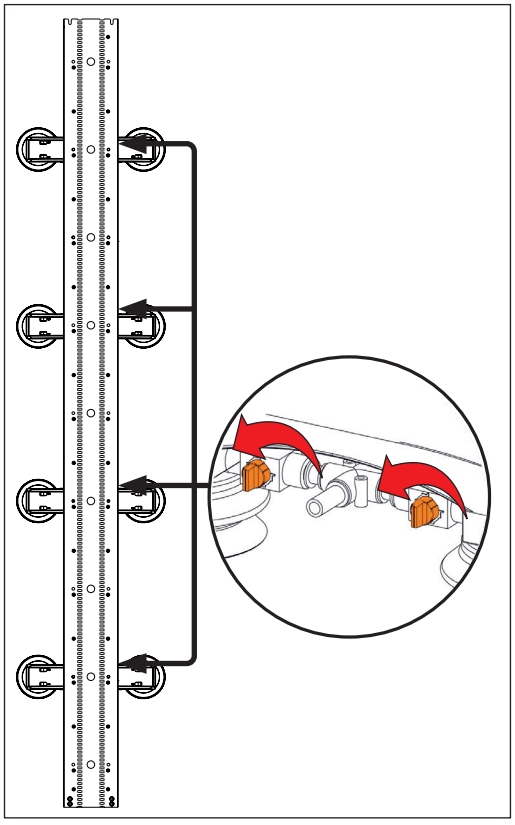


1. Make sure that the shut-off valve for the vacuum line is closed.

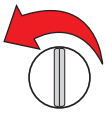


Shut-off valve closed

Shut-off valve open



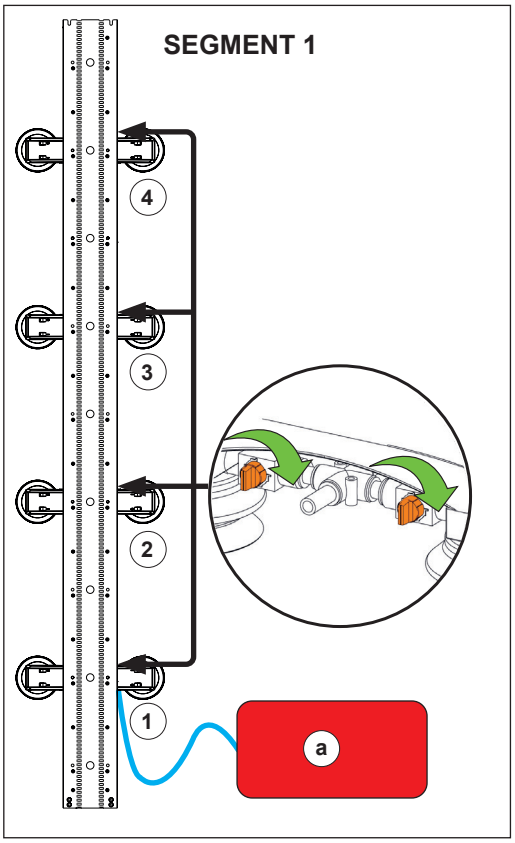
2. Close the shut-off valves of the vacuum cups.



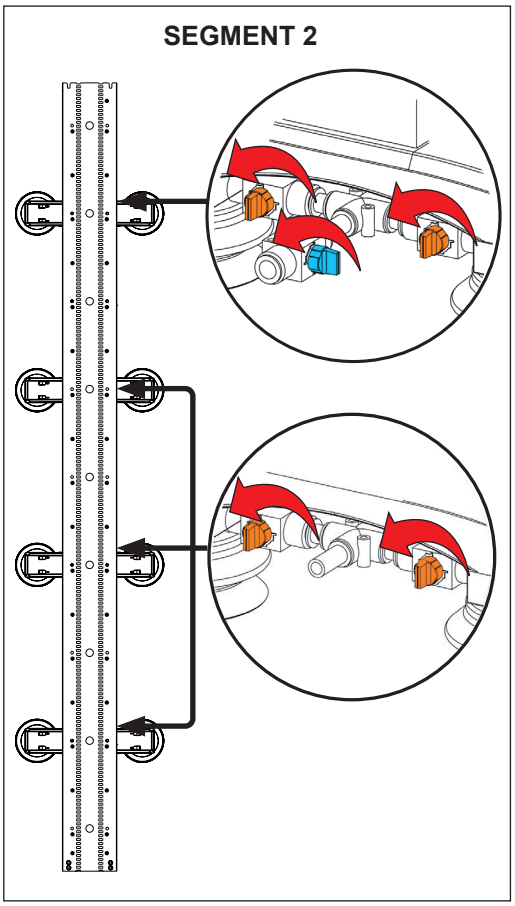
Shut-off valve closed

Shut-off valve open

Mounting vacuum rails
(continued)

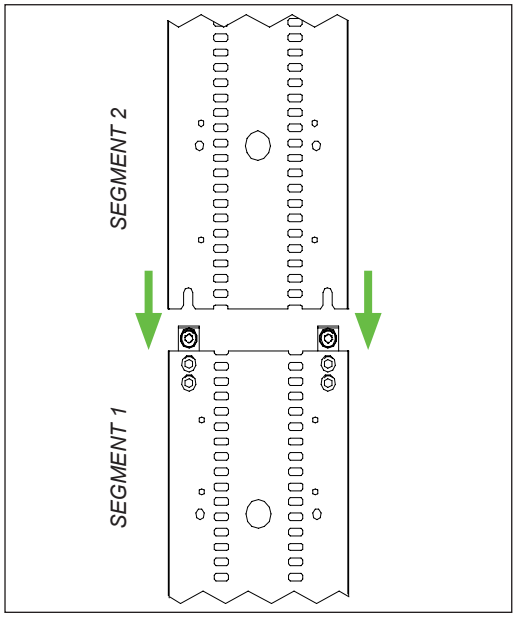


3. Connect the vacuum pump (a) to the first rail segment and switch on.
4. Place the rail segment on the part.
5. Open the shut-off valves of the suction feet one after the other in the numbered sequence (1 to 4).
6. Hook the load arrestor into the eye bolts on the first and last vacuum bridge of the rail segment.

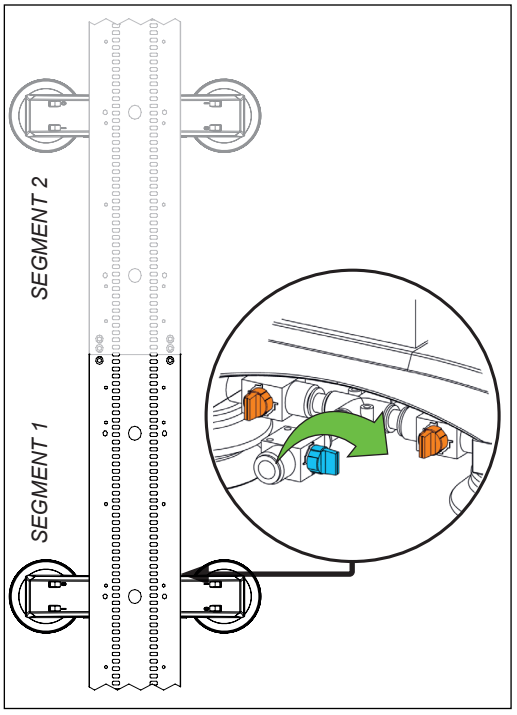


7. Before mounting the next rail segment, make sure that
   - The shut-off valve of the supply line is closed
   - All shut-off valves of the vacuum feet are closed

Mounting vacuum rails
(continued)

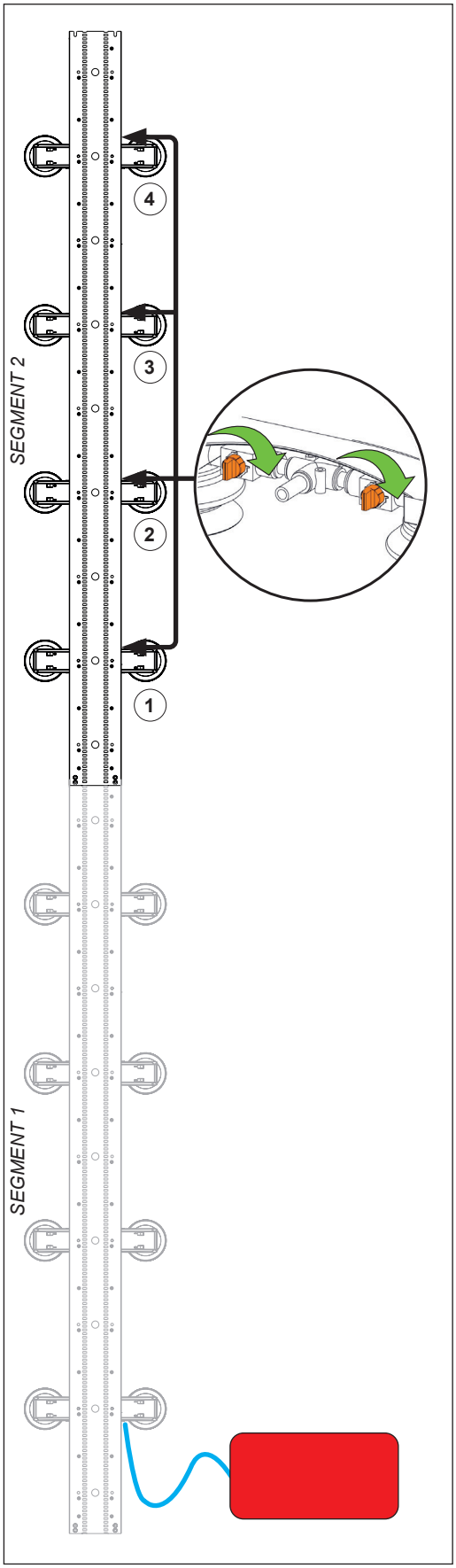


8. Connect the rail segments with the connecting elements.
9. Connect the vacuum line.



10. Hook the load arrestor into the eye bolts on the first and last vacuum bridge of the rail segment just mounted.
11. Open the shut-off valve of the vacuum line on rail segment 1.

Mounting vacuum rails
(continued)



12. Open the shut-off valves of the suction feet on rail segment 2 in the numbered sequence (1 to 4).
13. To install each additional rail segment, repeat points 7 to 12.

Securing vacuum rails

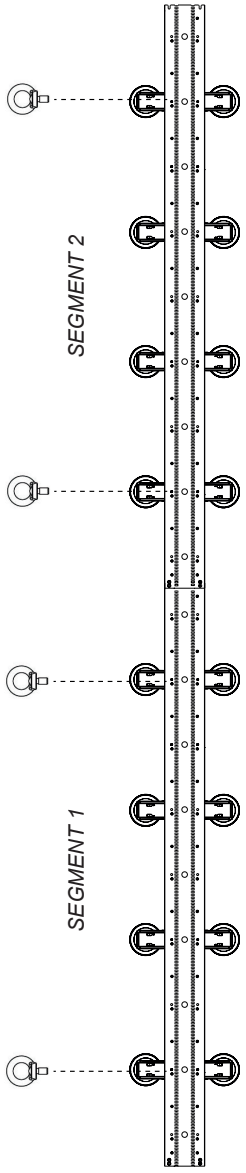
IMPORTANT! A failure of the vacuum pump or improper handling of the vacuum equipment can cause the trolley and rail construction to fall.* For this reason, the rail construction must be secured against falling during vertical use by means of a load arrestor with blocking function.
The load arrestor must be designed for the total weight of the trolley and rail construction.
The manufacturer does not accept any liability for personal injury or damage to property resulting from vertical use of the trolley without load arrestor!

NOTICE!

Ensure that the rope of the load arrestor is permanently kept under tension! Check load arrestor for damage before use.

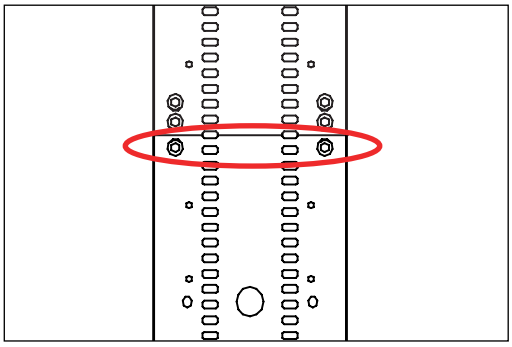
See also Operating Instructions "Vacuum pump FlexTrack 45".

Eye bolt 48,0005,1830
for mounting the
load arrestor

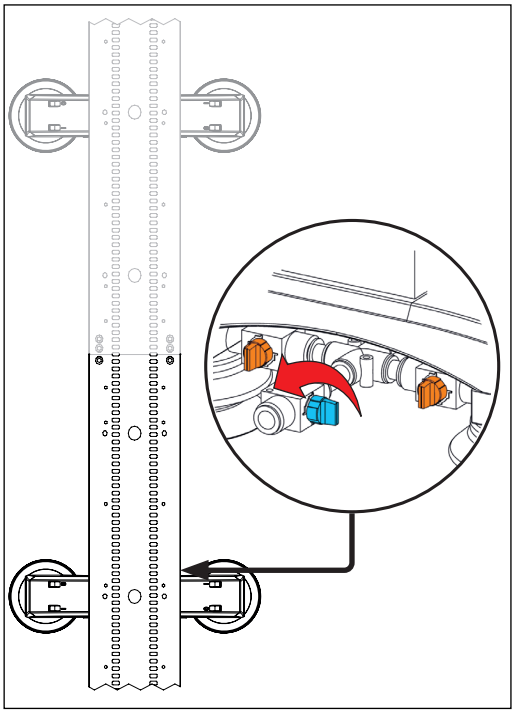


Removing vacuum rails

IMPORTANT! At least two persons are required to remove the rail system.



1. Loosen the connection screws between the penultimate and last rail segment.



2. Hold the last rail segment in place. Close the shut-off valve of the vacuum line on the penultimate rail segment.
3. Disconnect the vacuum supply line.

4. Carefully remove the rail segment and unhook the load arrestor.
5. So that the rail segment is immediately ready for the next application, close all shut-off valves again.
6. To remove the next rail segment, repeat points 1 to 5.

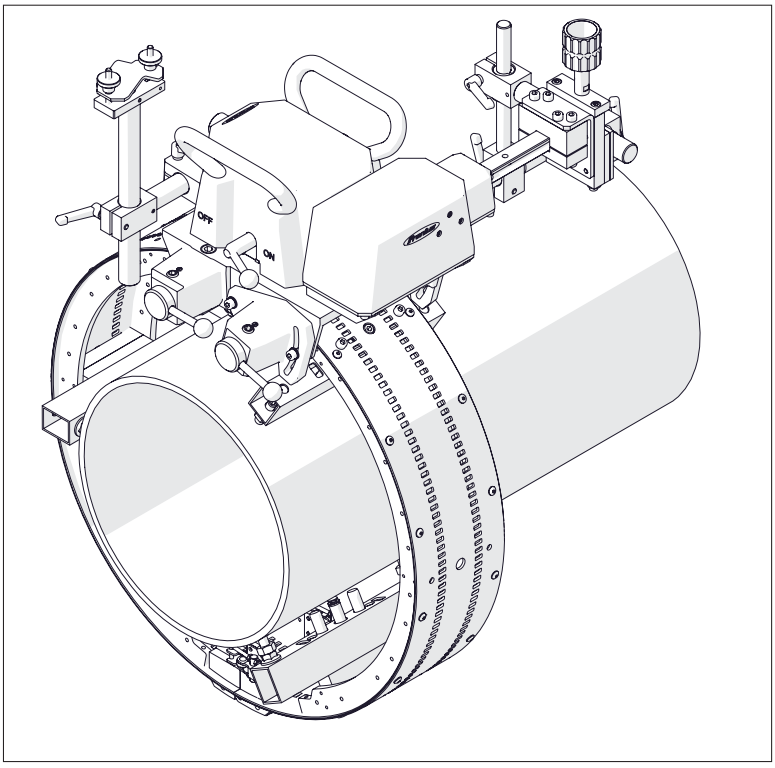
Commissioning the carriage

Placing the carriage on a straight guide rail

1. Remove the remote control. The carriage must be installed on the guide rail without the remote control.
2. Set the mains switch on the control box to ON.
3. Coupling and levers for the rollers in the "OFF" position.
4. Lift the carriage using the handles and place it on the rails.
5. Set the lever for the adjustable pressure rollers to the "ON" position.
6. Manually pull the carriage along the full length of the rail once to check whether the welding torch remains at a constant distance from the workpiece. If the distance is not constant, set the correct distance "M" on the relevant bridges.
7. Push the carriage along the rail. At the same time, set the coupling to the "ON" position to engage the gearbox unit with the openings on the guide rail.
8. Check the following switches on the remote control:
   - Welding mode switch in position "0"
   - Change direction / stop in the central position switch (only with BASIC remote controls).

Placing the carriage on a circular guide rail

1. Remove the remote control. The carriage must be installed on the guide rail without the remote control.
2. Set the mains switch on the control box to ON.
3. Coupling and levers for the rollers in the "OFF" position.
4. Loosen the three M6x20 holding the pressure rollers in place, on both sides.
5. Place the carriage horizontally on the rail above the centre of the workpiece and hold it by the handle.



6. Set the lever for the adjustable pressure rollers to the "ON" position.

Placing the carriage on a circular guide rail (continued)

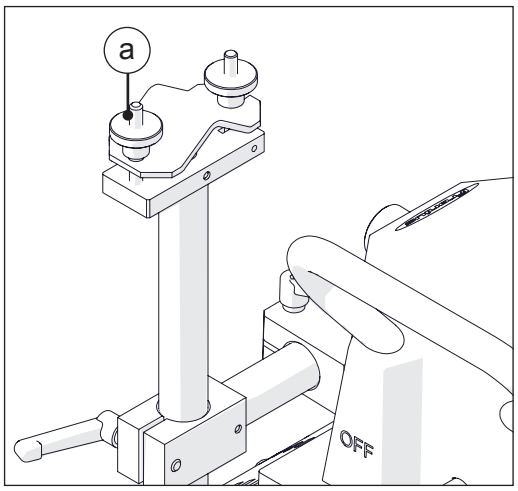
7. Tighten the three M6 mounting screws on both sides.
8. Manually pull the carriage along the full length of the rail once to check whether the welding torch remains at a constant distance from the workpiece. If the distance is not constant, set the correct distance "M" on the relevant bridges.
9. Push the carriage along the rail. At the same time, set the coupling to the "ON" position to engage the gearbox unit with the openings on the guide rail.
10. Check the following switches on the remote control:
    - Welding mode switch in position "0"
    - Change direction / stop switch in the central position (only applicable for the BASIC remote control).

Disengaging the carriage

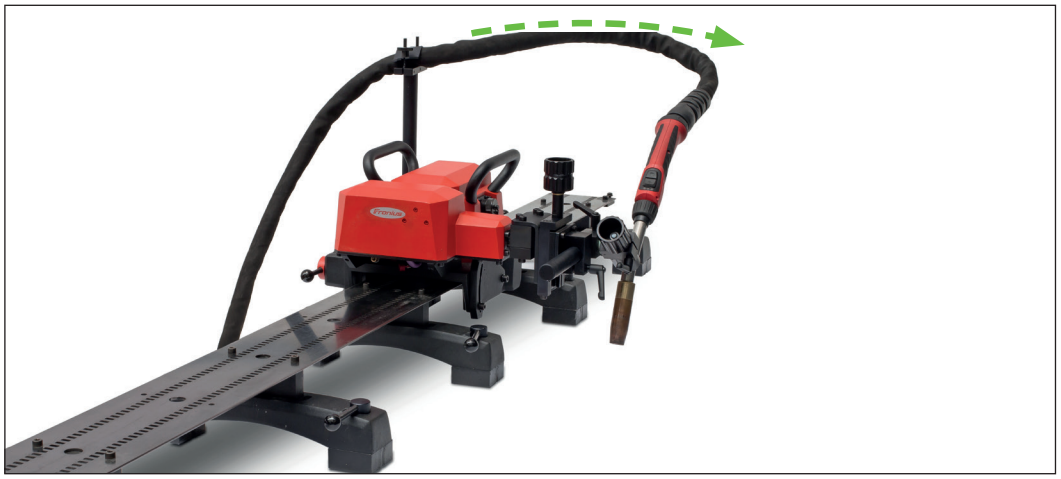
To attain optimum wirefeed, observe the following when laying the hosepack:
- Do not allow the hosepack to become kinked
- Always lay the hosepack as straight as possible

NOTICE!

Observe the maximum tensile load on the hosepack holder (see the “Technical data” section). This value must not be exceeded.

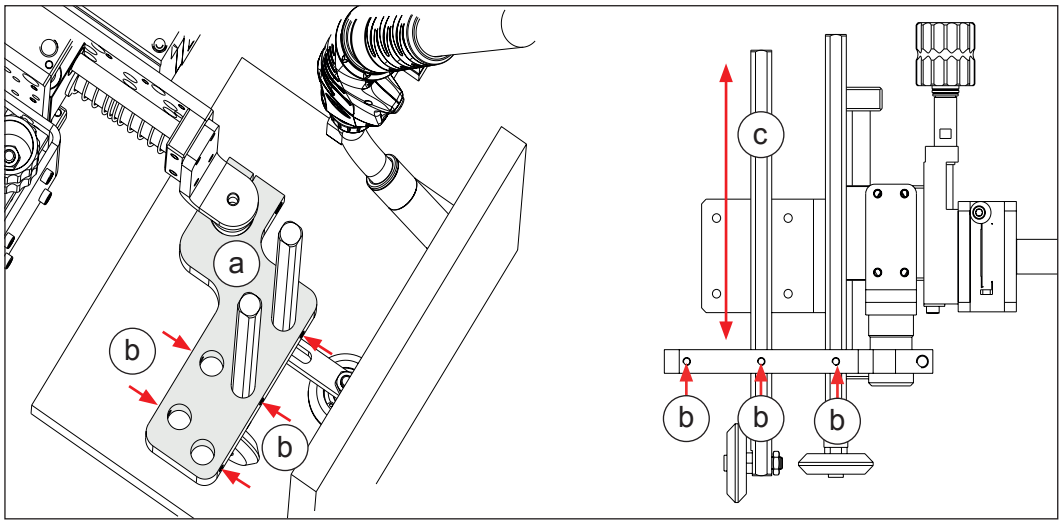


1. Undo the knurled screw (a) on the clamp.
2. Insert the hosepack as illustrated
   IMPORTANT! Do not kink the hosepack. This can cause wirefeed problems.
3. Tighten the knurled screw (a)



Setting the mechanical seam tracking (if used)

The mounting plate (a) for the guide rollers has five holes in which the rollers can be placed and secured.
The rollers can be secured in these holes using the fixing screws (b).



1. Undo the fixing screws (b) for the chosen holes.
2. Position the guide rollers at the desired height.(c).
3. Tighten the fixing screws (b) again.

Operation

Connecting to the TPS power source

Configuration

1pc	38,0100,0457	Connection cable between CanOpen and control box, 5 m
1pc	4,100,251	RI MOD/i CC CANopen

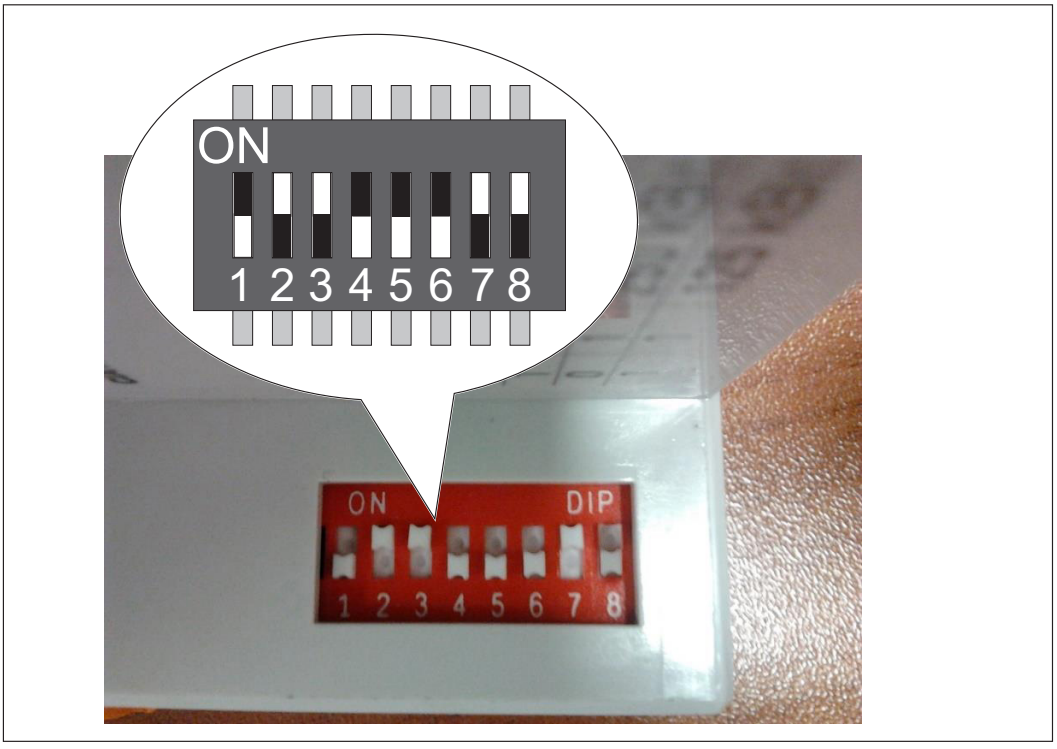
CANopen Image modes

DIP switch								
8	**7**	**6**	**5**	**4**	**3**	**2**	**1**	**Configuration**
OFF	OFF	-	-	-	-	-	-	Standard image 320 bit
OFF	ON	-	-	-	-	-	-	Economy image 128 bit
ON	OFF	-	-	-	-	-	-	Retrofit: Scope depends on the bus module
ON	ON	-	-	-	-	-	-	Not used

Setting the NODE address (BASIC and PRO remote Control)

DIP switch								
1	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**Node address**
OFF	ON	ON	OFF	OFF	OFF	ON	ON	6

NODE address = 6



Starting sequence

1. Switch on the TPS power source.
2. Wait until the power source is fully powered up.
3. Now switch in the FlexTrack control box.

Connecting to the TPSi power source

Configuration

1pc	38,0100,0463	Data cable between control box and power source, 2 m
1pc	4,044,014,IK	RI FB Inside/i - Factory installation
1pc	4,044,014,CK	RI FB Inside/i - Customer installation
1pc	41,0018,0081	RI MOD/i CC CANopen

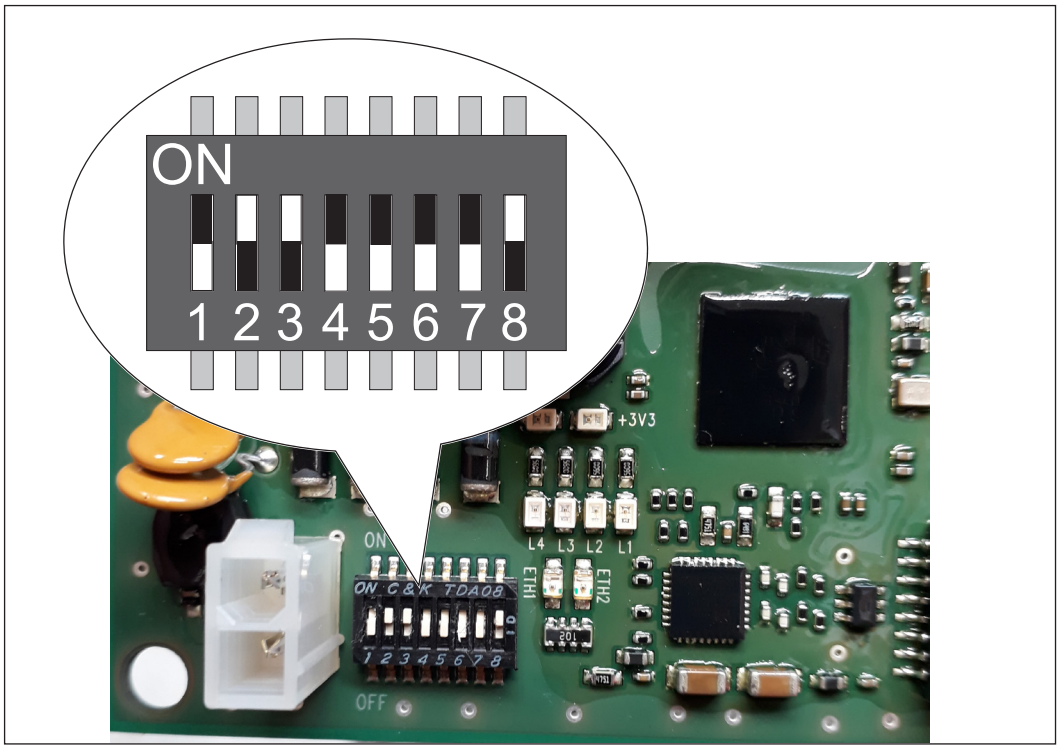
CANopen Image modes

DIP switch								
8	**7**	**6**	**5**	**4**	**3**	**2**	**1**	**Configuration**
OFF	OFF	-	-	-	-	-	-	Standard image 320 bit
OFF	ON	-	-	-	-	-	-	Economy image 128 bit
ON	OFF	-	-	-	-	-	-	Retrofit: Scope depends on the bus module
ON	ON	-	-	-	-	-	-	Not used

Setting the NODE address: Remote control BASIC

DIP switch								
1	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**Node address**
OFF	ON	ON	OFF	OFF	OFF	OFF	ON	6

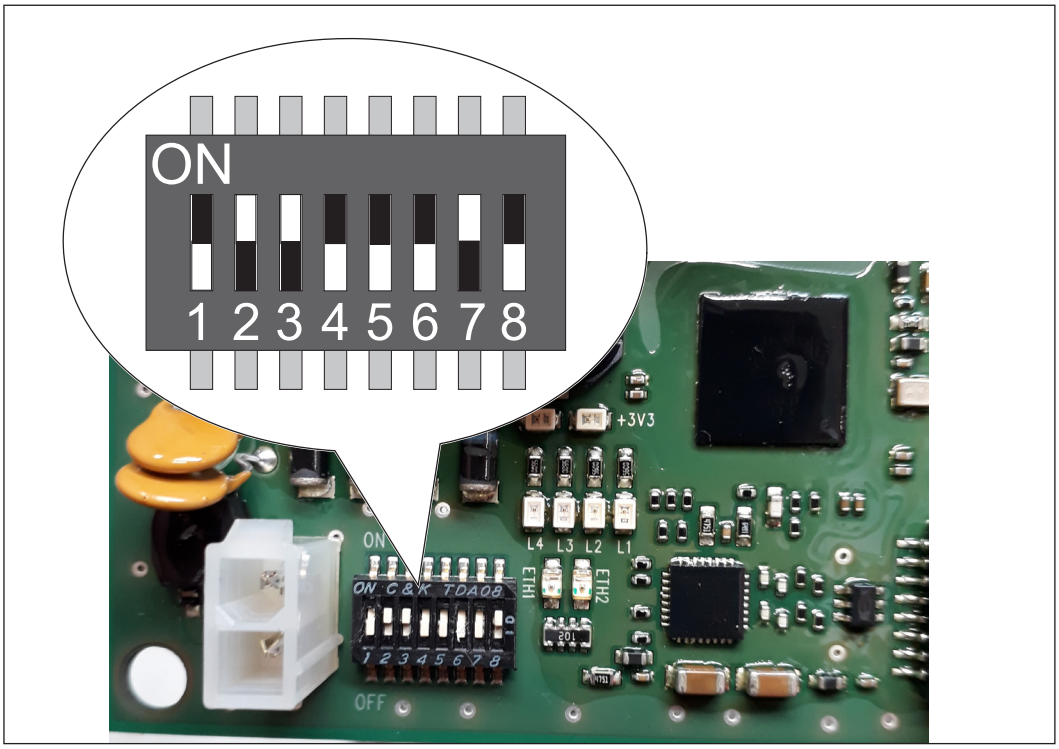
NODE address = 6
(including Retrofit mode)



Setting the NODE address: Remote control PRO

DIP switch								
1	2	3	4	5	6	7	8	Node address
OFF	ON	ON	OFF	OFF	OFF	ON	OFF	6

NODE address = 6
(including Retrofit mode)



Starting sequence

1. Switch on the TPS power source.
2. Wait until the power source is fully powered up.
3. Now switch in the FlexTrack control box.

FRC-45 Basic remote control

Safety

WARNING!

Operating the equipment incorrectly can cause serious injury and damage.

Do not use the functions described here until you have fully read and understood the following documents:

- These Operating Instructions
- All the Operating Instructions for the system components, especially the safety rules.

FRC-45 Basic control elements

FRC-45 Basic control elements
(continued)

(1) Numerical display, 4 digits (metric / imperial)

Displays welding parameters and error codes.

(2) Limit switch function, change direction / stop

Depending on the switch position, the welding carriage changes direction or stops as soon as the limit switch is activated.

(3a) Dwell time, left / return travel path

White symbol: Oscillation dwell time, left

Regulates the oscillation dwell time on the left.

Yellow symbol: Return travel path

Return time at the end of the welding path in seconds [s].

(3b) Dwell time, middle / segment welding

White symbol: Oscillation dwell time, middle

Regulates the oscillation dwell time in the middle of the oscillation motion.

Yellow symbol: Segment path with welding

Sets the length of the individual welding segments in [cm].

(3c) Dwell time, right / segment path without welding

White symbol: Oscillation dwell time, right

Regulates the oscillation dwell time on the right.

Yellow symbol: Segment path without welding

Sets the distances between the individual segments in [cm].

(4) Oscillation speed

Regulates the oscillation speed:
- in [cm/min] for the linear oscillation unit
- in [%] for the radial oscillation unit

(5) Offset

Regulates the offset during oscillation.

(6) Traversing direction

Selects the traversing direction.

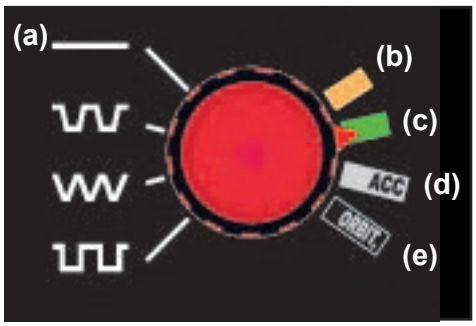
(7) Travel speed

Regulates the travel speed of the welding carriage.

(8) Welding mode

3 welding modes can be selected:
- Test
- Without arc (O)
- With arc (I)

(9) Selector switch



(a) White symbols: Oscillation mode

Four oscillation modes can be selected:
- No oscillation
- Trapezoidal oscillation
- Triangular oscillation
- Rectangular oscillation

FRC-45 Basic control elements (continued)

(b) Yellow marking: Preset segment welding

Preset to select the additional segment welding functions (yellow symbols).

IMPORTANT! The welding process cannot start until the oscillation mode adjusting knob (9) is set to one of the white function parameters.

(c) Green marking: Preset path measurement

Preset to select the additional path measurement function (green symbol) on the oscillation path button (10).

IMPORTANT! The welding process cannot start until the oscillation mode adjusting knob (9) is set to one of the white function parameters.

(d) ACC option

Regulates the distance between the welding torch and the workpiece.

IMPORTANT! For a detailed description of the ACC function, see the chapter entitled "ACC FUNCTION".

(e) ORBITAL option

IMPORTANT! For a detailed description of the orbital function, see the chapter entitled "ORBITAL FUNCTION".

(10) Oscillation path / total welding path

White symbol: Oscillation path

Regulates the oscillation path:
- in [cm/min] for the linear oscillation unit
- in [%] for the radial oscillation unit

Green symbol: Total welding path

Total welding path in [cm].

(11) End-crater filling time / start-up delay

White symbol: End-crater filling time

Period of time, in which the carriage remains at the weld seam end, to fill the end crater.

IMPORTANT: Parameters must be entered via the power source and must be either equal to or greater than the original power source value (End current time).

Yellow symbol: Start-up delay / Flying-start

If value is positive – start-up delay [s]: Start welding -> Dwell time elapses -> Carriage starts to move.
If value is negative – flying-start [s]: Carriage starts to move. The arc does not ignite until the "flying start" time has expired.

Define parameters for the carriage

NOTICE!

The oscillation unit must be connected to the welding carriage when saving programs with oscillation parameters.

The remote control can be used to configure 9 welding programs with the following parameters:

With oscillation:
- Travel speed
- Oscillation path
- Oscillation speed
- Dwell time, left
- Dwell time, middle
- Dwell time, right
- End-crater filling time

Without oscillation:
- Travel speed
- End-crater filling time

Additional functions:
- Path measurement (green markings)
- Segment welding (yellow markings)

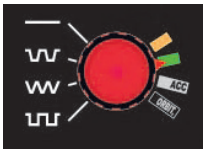
Define parameters for the carriage (continued)

To set a parameter, turn the corresponding adjusting knob:
to the right: to increase the value
to the left: to reduce the value
When a setting has been adjusted, the value of the parameter is shown on the display.
Press the adjusting knob to save the value for the setting.

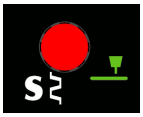
Selecting additional functions

IMPORTANT! After adjusting settings for the additional functions, turn the oscillation mode knob (1) back to the oscillation mode required (white markings), otherwise the welding process cannot start.

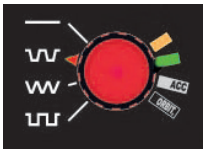
Additional function - path measurement:



1. Set the oscillation mode knob to the GREEN marking.

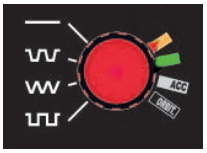


2. Turn the oscillation path knob and set the welding path required.



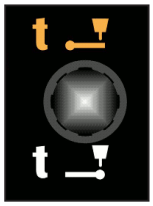
3. Turn the knob back to the white function parameter required.

Additional function - segment welding:

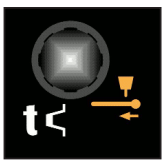


1. Set the oscillation mode knob to the YELLOW marking.

2. Set the segment welding function parameter:



Start-up delay / flying-start:
If start-up delay value is positive [s]: Start welding - Dwell time elapses - Carriage starts to move.
If start-up delay value is negative [s]: Carriage starts to move. The arc does not ignite until the "flying start" time has expired.

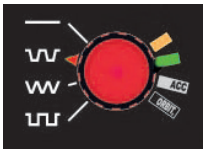


Return travel path:
Return time at the end of the welding path.

Segment path with welding:
Length of the individual welding segments.

Segment path without welding:
Length of the distances between the individual welding segments.

Selecting additional functions (continued)



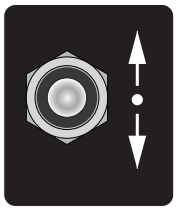
3. Turn the knob back to the white function parameter required.

Saving a program

Before saving a program:

Set the toggle switch for the "Change direction/stop" limit switch functions to the lower position (change direction).

Set the welding mode toggle switch to the 0 position.



Set the traversing direction toggle switch to the central position 0.

To save a program:

- Press the travel speed knob (7) and end-crater filling time knob (11) at the same time and hold for 4 seconds.
- memX appears on the display. X stands for the program number that has not yet been selected.
- Turn the travel speed knob to select the program number required.
- Press the travel speed knob to save the program with this number.

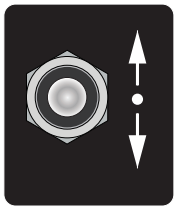
Loading the welding program

NOTICE!

The remote control has a factory-saved, read-only program “mem0”, which contains the working parameters for the welding carriage and oscillation unit.
The value “mem0” cannot be overwritten.

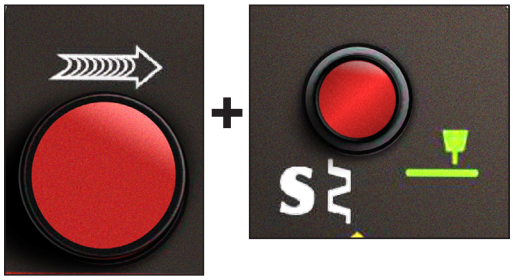
To load a saved program, "mem" and the number of the last used program must be shown on the display.

Set the welding mode toggle switch to the 0 position.

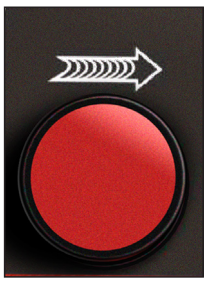


Set the traversing direction toggle switch to the central position 0.

Set the change direction/stop toggle switch to the change direction position.



Press the travel speed button and the oscillation path / total welding path button at the same time for at least 4 seconds.

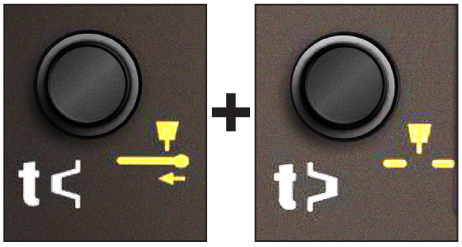


Turn the travel speed button to select a program.
Press the button again to load the program.

Changing the units of measurement

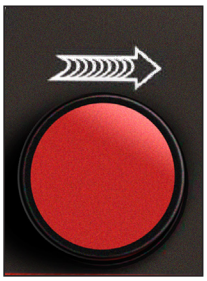
Measurements can be displayed in either metric (cm) or imperial (inch) units.
To change the units, proceed as follows:

Set the main switch on the control box to 0 (off).



Press and hold the left and right dwell time buttons at the same time.

Switch on the main switch on the control box. The unit of measurement selected (cm or inch) is shown on the display.



Select the setting required using the travel speed knob.

Press the travel speed knob once to confirm and apply the setting.

FRC-45 Pro remote control

Safety

WARNING!

Operating the equipment incorrectly can cause serious injury and damage.

Do not use the functions described here until you have fully read and understood the following documents:

- These Operating Instructions
- All the Operating Instructions for the system components, especially the safety rules.

FRC-45 Pro control elements

FRC-45 Pro control elements
(continued)

(1) Touch display

Displays welding parameters and error codes.

(2) Quick Stop

- Stops all movement
- stops arc and welding process
- but the power supply remains present.

(3) Welding power selection wheel

For regulating the preset welding power (m/min).

► The selection wheel must be pressed and turned simultaneously, in order to change the preselected value.
IMPORTANT! Welding power value can only be changed in main menu!

(4) Multifunctional dial

Turning the button:
- Navigates through the menu
- Changes a parameter
- Changes a parameter value

Pressing the button:
- Selects a menu
- Selects a parameter
- Confirms an altered parameter value

(5) Keys F1 to F4

Keys are freely configurable, functions can be selected in the service menu

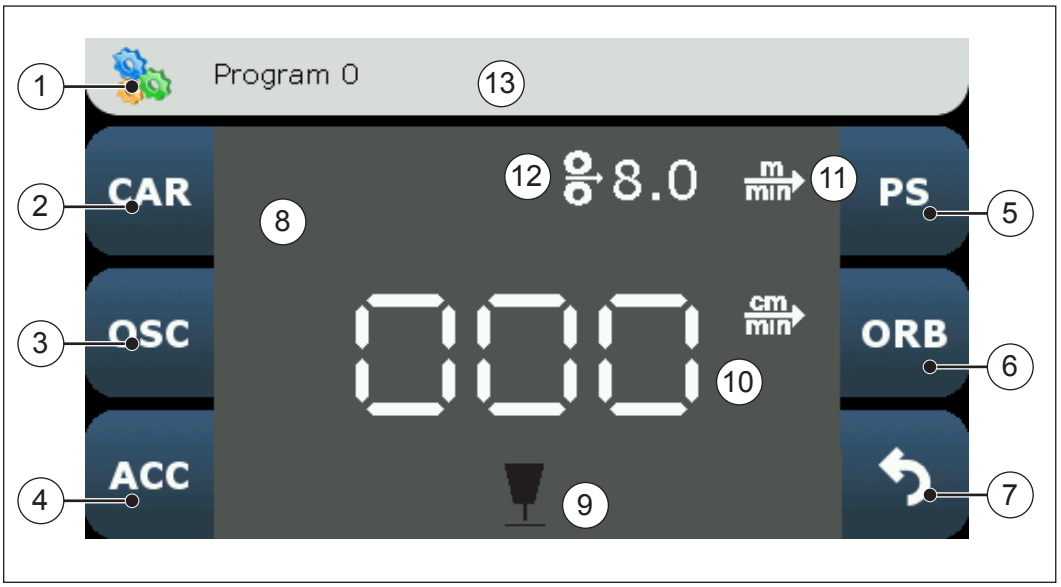
(6) Welding mode

3 welding modes can be selected:
- Test
- Without arc (O)
- With arc (I)

(7) Traversing direction

Selects the traversing direction of the carriage: forwards or backwards

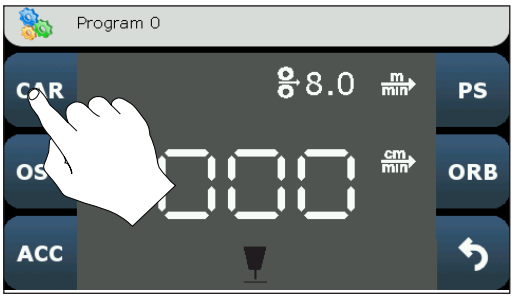
Touch display



(1)	**SERVICE menu**
	For loading and saving welding programs. The keys F1 to F4 are also individually assigned in the service menu.
(2)	**CARRIAGE menu**
	For editing the parameters that affect the carriage.
(3)	**OSC menu**
	For editing the oscillation parameters.
(4)	**ACC menu**
	For editing all parameters for the ACC function (Arc Current Control).
(5)	**PS menu**
	For editing the power source parameters.
(6)	**ORBITAL menu**
	For editing the orbital parameters.
(7)	**BACK button**
	Return to main menu.
(8)	**Options display**
	Displays related options and modules, such as oscillation unit, ACC module, orbital, etc.
(9)	**Status indicator**
	Displays an active or inactive arc, as well as the limit switches for the carriage or oscillation unit.
(10)	**Carriage speed**
	Displays the set carriage speed.
(11)	**Welding power**
	Displays the currently set welding power in m/min.
(12)	**Wire feed speed**
(13)	**Display field for error messages or Quick Stop button**

Standard software functions

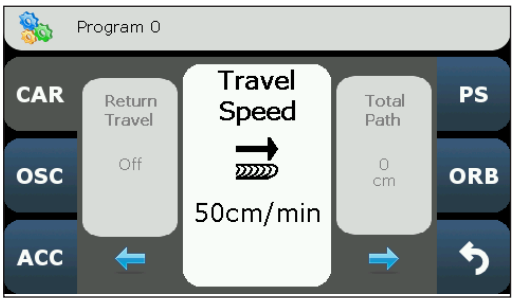
Selecting a menu



Tap the desired menu button to access the menu.

The following menus are available for selection:
- Carriage
- Oscillation unit (Osc)
- ACC
- Power source (Ps)
- Orbital

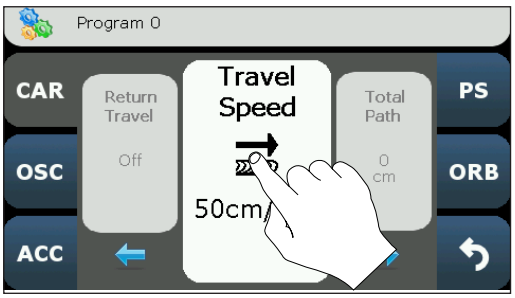
Select a welding parameter



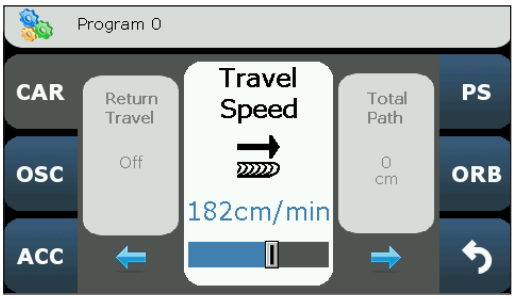
Three parameters are always displayed at the same time.
The currently active parameter is enlarged in the centre.

To scroll either:
- Tap the blue arrows
- Scroll with the multifunctional dial
- Tap the parameter field directly and move the display

Editing parameters

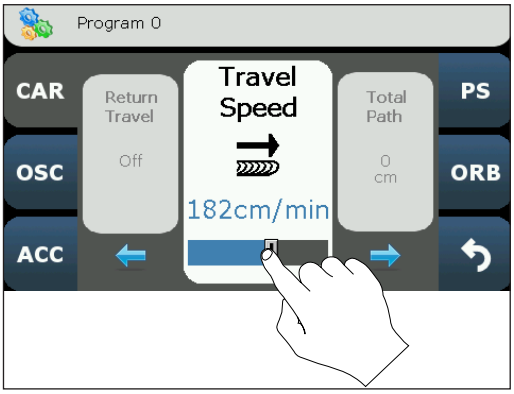


To edit a parameter either:
- Click on the parameter field
- Press once on the multifunctional dial

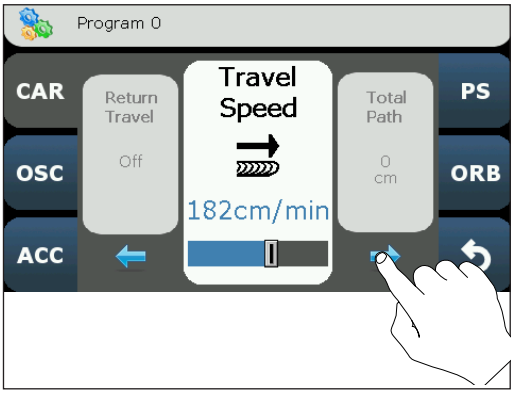


In editing mode, the parameter value will be displayed in blue font.
A blue slider appears.

Editing parameters (continued)

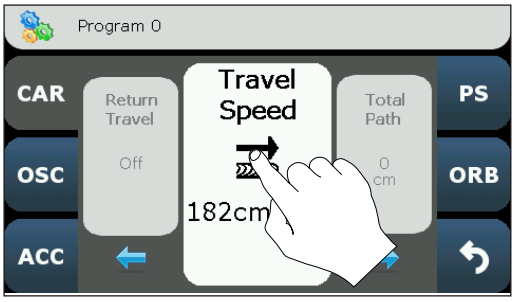


Rough adjustment of the parameter value:
Tap the slider and move
as desired.



Fine adjustment of the parameter value:
Tap the blue arrows and set the desired value.

Saving parameters



To save the adjusted value either:
- Tap the parameter field again
- Press once on the multifunctional dial

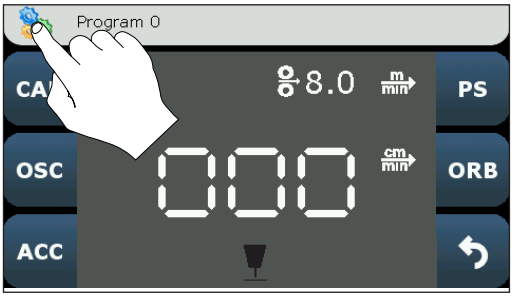
NOTICE!

In order to edit the oscillation parameters, the oscillation unit must be attached to the carriage.

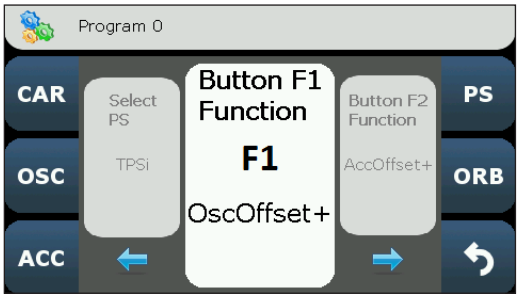
Service menu

Assigning function keys

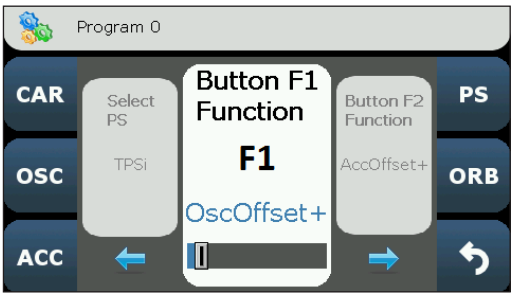
Keys F1 to F4 can be assigned with functions from the service menu.
Follow these steps:



1. Tap the gear wheel symbol
   ► The service menu will open.

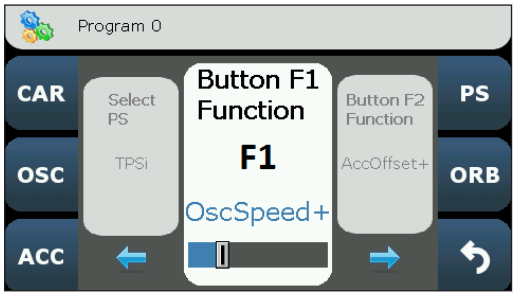


2. Use the multifunctional dial to select the "Button F1 Function" parameter field.

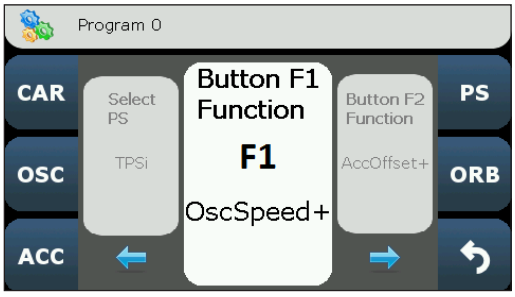


3. Press the multifunctional dial once.

► The first parameter appears in blue font.



4. Use the multifunctional dial to select the desired parameter.

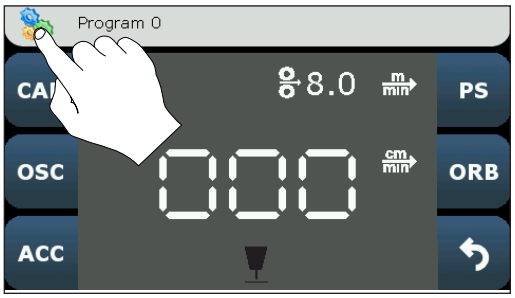


5. Press the multifunctional dial once to save the setting.

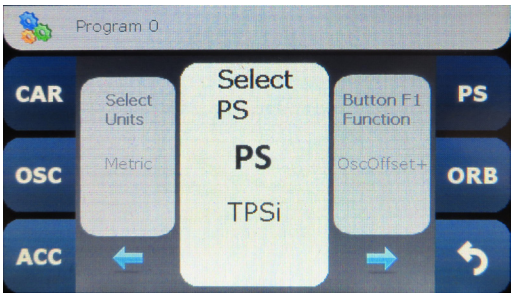
► The function key F1 has been assigned.

6. To assign keys F2 to F4, repeat steps 2 to 5.

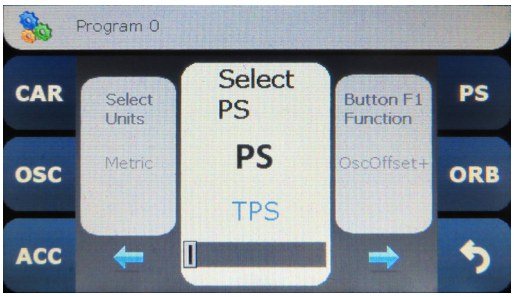
Selecting power source



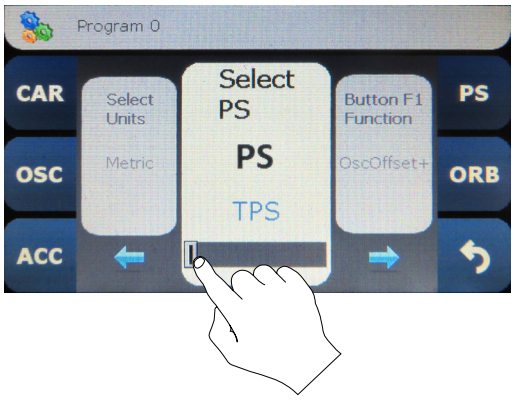
1. Tap the gear wheel symbol
   ► The service menu will open.



2. Use the multifunctional dial to select the "SELECT PS" parameter field.



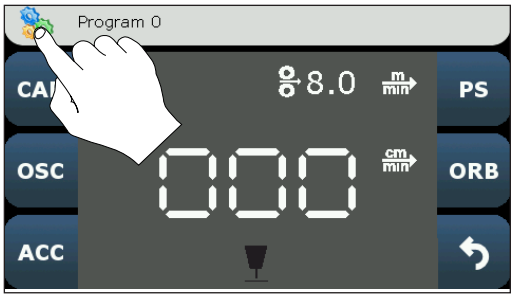
3. Press the multifunctional dial once to access the list of programs.
   The slider appears.



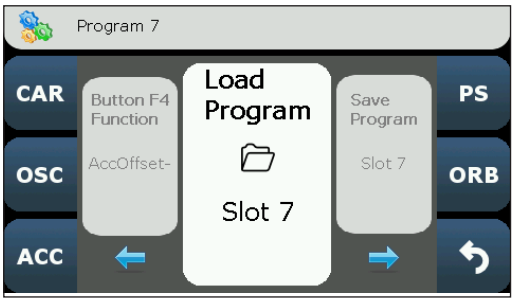
4. To select power source:
   - either turn the multifunctional dial
   - or touch the slider and move it.

5. Press the multifunctional dial once to confirm.

Loading welding program

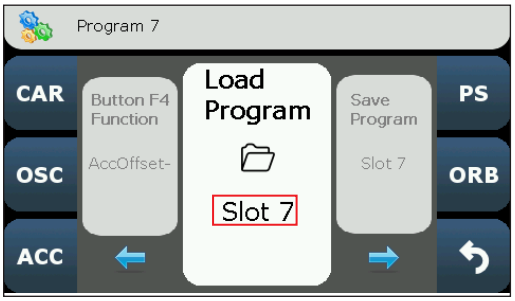


1. Tap the gear wheel symbol
   ► The service menu will open.



2. Use the multifunctional dial to select the "Load Program" parameter field.

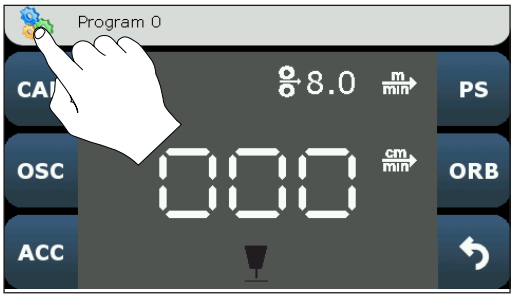
3. Press the multifunctional dial once to access the list of programs.



4. Turn the multifunctional dial and select the desired program number.

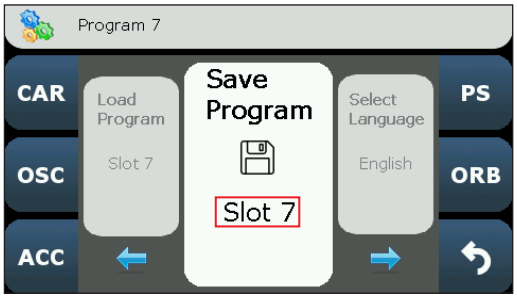
5. Press the multifunctional dial once to confirm.

Saving welding program



1. Tap the gear wheel symbol
   ► The service menu will open.

2. Use the multifunctional dial to select the "Save Program" parameter field.



3. Press the multifunctional dial once.

   ► The next free program number is displayed.

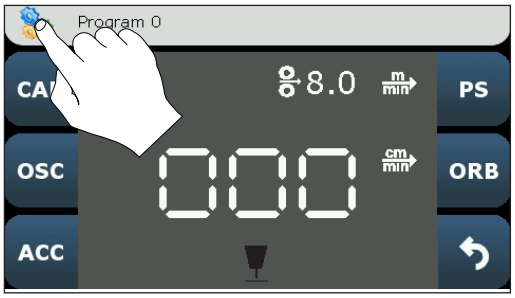
4. Press the multifunctional dial once to save the welding program.

Selecting the language

The FRC-45 Pro remote control makes it possible for the operator to choose between four languages:

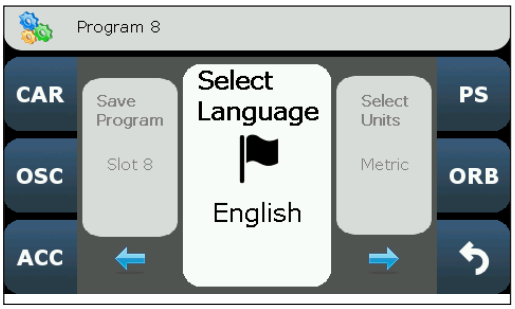
- German
- English
- French
- Spanish

To change the language, proceed as follows:

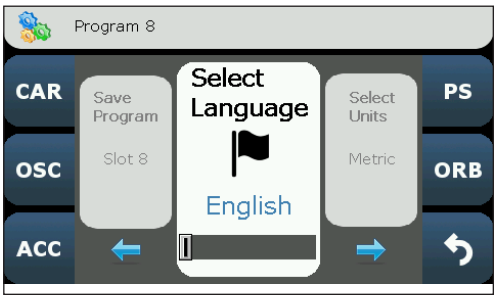


1. Tap the gear wheel symbol
   ► The service menu will open.

Selecting the language
(continued)



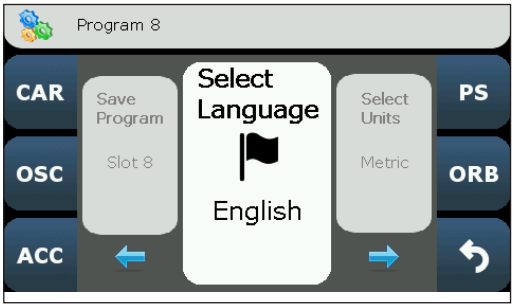
2. Use the multifunctional dial to select the "Select Language" parameter field.



3. Press the multifunctional dial once.

► The language line is displayed in blue. A blue slider appears.

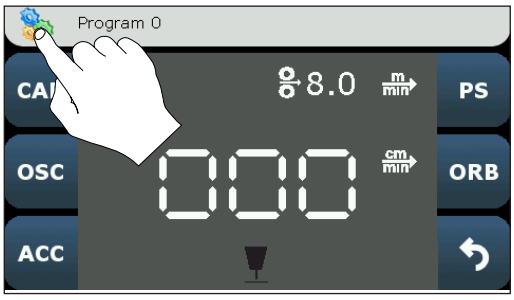
4. Use the multifunctional dial to select the required language.



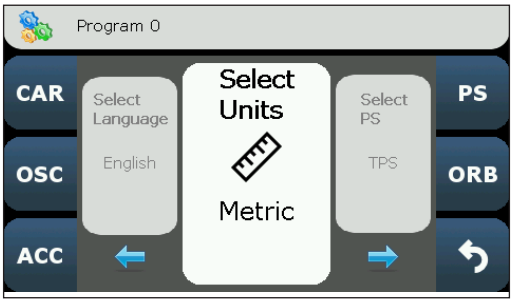
5. Press the multifunctional dial once to confirm.

Changing the units of measurement

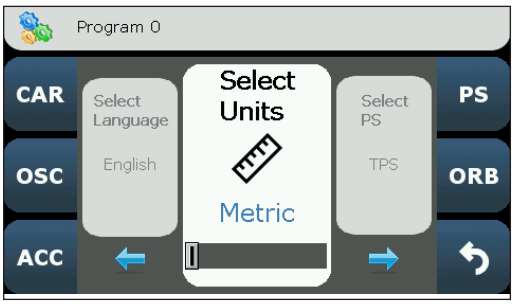
Measurements can be displayed in either metric (cm) or imperial (inch) units.
To change the units, proceed as follows:



1. Tap the gear wheel symbol
   ► The service menu will open.



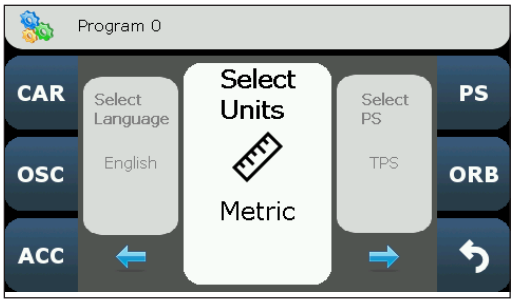
2. Use the multifunctional dial to select the "Select Units" parameter field.



3. Press the multifunctional dial once.

   ► The unit indication is displayed in blue. A blue slider appears.

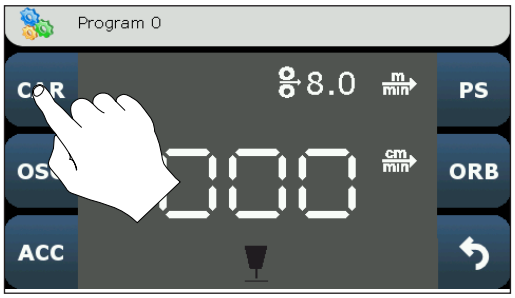
4. Use the multifunctional dial to select the required unit of measurement.



5. Press the multifunctional dial once to confirm.

Menu description

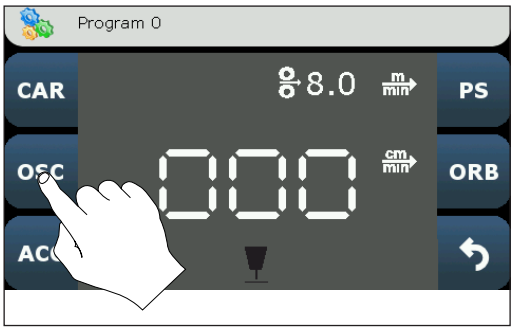
CARRIAGE menu



Press the CARRIAGE menu button to access these parameters.

The following parameters are available:	
Travel Speed	Regulates the travel speed of the welding carriage. Display in [cm/min].
Total Path	Total welding path in [cm]. Once this distance has been reached, the welding process will stop automatically. The total path can be divided into several segments.
Welding Width	Segment length in [cm].
Segment Gap	Segment space in [cm].
Back Filling	The path in which the carriage travels in the opposite direction to fill the end-crater. Information in [s].
Start Delay	Defines the time between ignition of the arc and commencement of carriage movement. Setting range: 0 to +5 s
Flying Start	Defines the time between the commencement of carriage movement and ignition of the arc. Setting range: 0 to -5 s
End Crater Filling	Enables the weld seam to be finished smoothly. Information in [s].
Return Travel	Limit switch function, change direction / stop: According to the settings, the carriage will have the following response when the limit switch is reached: - Carriage stops - Carriage changes direction and continues moving.

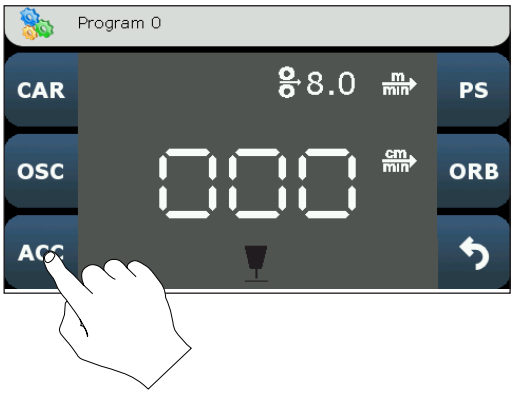
OSC menu



Press the OSC menu button to access these parameters.

The following parameters are available:	
Oscillation Speed	Regulates the oscillation speed. - When using the linear oscillation unit: Display in [cm/min] - When using the radial oscillation unit: Display in [%]
Oscillation Path	Regulates the oscillation path. - When using the linear oscillation unit: Display in [cm/min] - When using the radial oscillation unit: Display in [%]
Dwell time Left	Regulates the oscillation dwell time on the left. Displayed in [s].
Dwell time Middle	Regulates the oscillation dwell time in the middle of the oscillation motion. Displayed in [s].
Dwell time Right	Regulates the oscillation dwell time on the right. Displayed in [s].
Oscillation Mode	Oscillation mode. Four oscillation modes can be selected: - No oscillation - Trapezoidal oscillation - Triangular oscillation - Rectangular oscillation
Offset	Regulates the offset during oscillation.

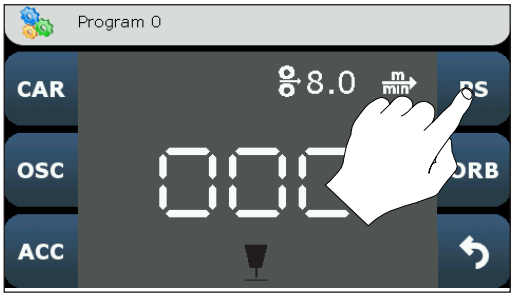
ACC menu



Press the ACC menu button to access these parameters.

IMPORTANT! For a detailed description of the ACC function, see the chapter entitled "ACC FUNCTION".

PS menu (Power Source)

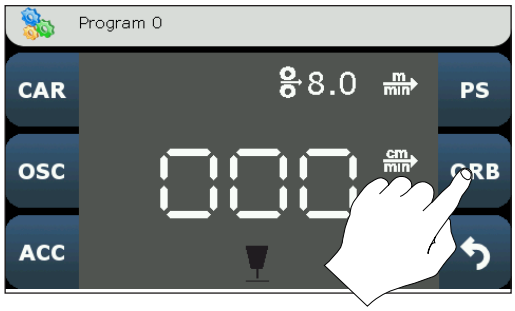


Press the PS menu button to access these parameters.

The following parameters are available:	
Wire feed speed	Wire feed speed in m/min
Gas Test	To check the gas flow before starting a welding process.
Wire Inching	Feeds the wire
Wire Retract	Retracts the wire
Arc Length Correction	For correcting the arc length.
Dynamic correction	For influencing the short-circuiting dynamic at the instant of droplet transfer. Setting range: -10 - +10 Factory setting: 0 - Harder, more stable arc 0 Neutral arc + Soft, low-spatter arc
Job number:	The following working modes can be selected:

0	Manual mode
1	Remote Controller (Special 2 Step)
2	Job mode
3	(not used)
4	Manual mode
5	Manual mode
6	Manual mode
7	Job mode manual (TPSi)
8	Remote controller (2Step)

ORBITAL menu



Press the ORBITAL menu button to access these parameters.
For a detailed description of the orbital function, see the chapter entitled "ORBITAL FUNCTION".

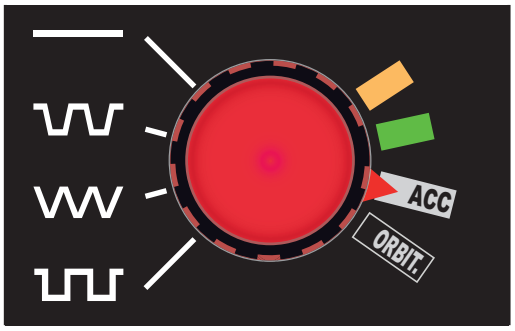
ACC function

General

ACC = Arc Current Control.
The FMS 100 or FMS 50 slide with ACC function communicates with the power source's system interface and controls the exact torch distance from the workpiece.
The Fronius CANOpen i-kit, item number 4,100,251, is also required.

IMPORTANT! The FMS slide with ACC function can be used with the TPS and TPSi power sources. The ACC function only works with steel components, not with aluminium materials.
When using the TPSi including PMC and LSC, the **penetration stabilizer** and **arc stabilizer** functions must be disabled.

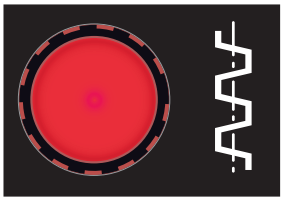
Activating the ACC function: FRC-45 Basic remote control



Turn the selector switch on the remote control to the ACC position.

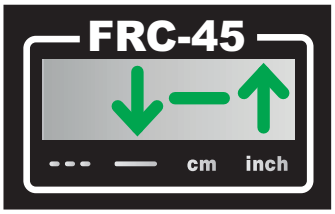
Once the selector switch has been turned to the ACC position, only the following buttons are active:

OFFSET button



When using without an oscillation unit:

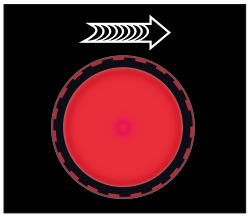
Turning the button: manually positions the welding torch.



When using the linear oscillation unit:

Turning the button: Manually positions the welding torch.
Pressing the button: Calibrates the distance between the welding torch and the workpiece.
Pressing the button once and turning: Offsets oscillation unit
Pressing the button twice and turning: ACC setting (up / down)

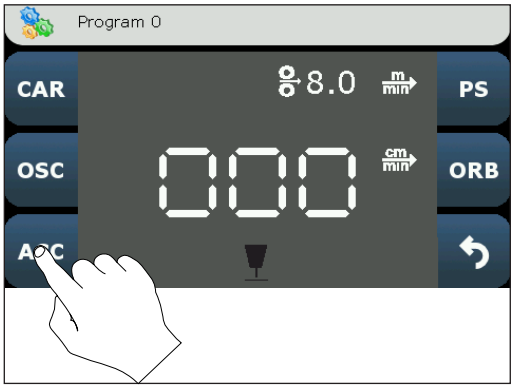
TRAVEL SPEED button



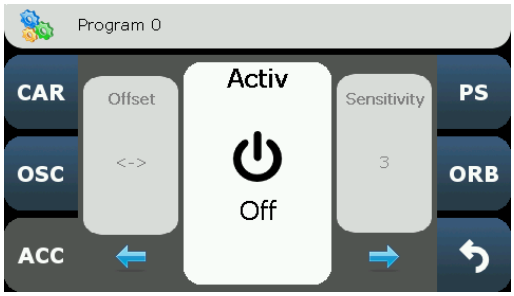
Used in ACC mode for the following functions:

- Selecting the welding parameters
- Changing the value of a parameter
- Confirming the selected value

Activating the ACC function: FRC-45 Pro remote control



1. Tap the ACC menu button on the touchscreen.



► The ACC ACTIV ON / OFF parameter is displayed.

2. Tap the parameter field or press the multifunctional dial once.

► The OFF parameter is displayed in blue.
► A button is displayed.

3. To switch to ON either:
   - Touch the button
   - Turn the multifunctional dial
   - Tap the right blue arrow

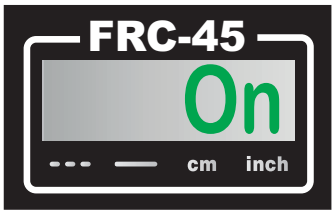
► The button is highlighted in blue, the display changes to ON.

4. To confirm the selection either:
   - Tap the parameter field again
   - Press the multifunctional dial once

ACC parameter

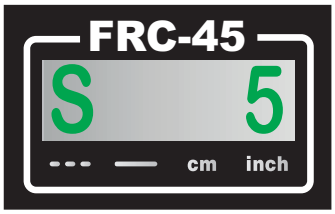
FRC-45 Basic	FRC-45 Pro

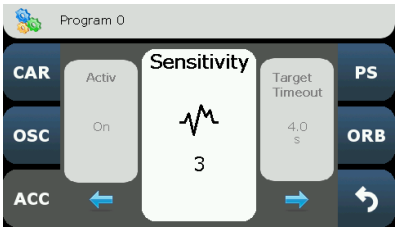
ON / OFF



For activating / deactivating the ACC function.

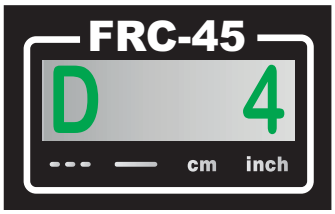
S / Sensitivity

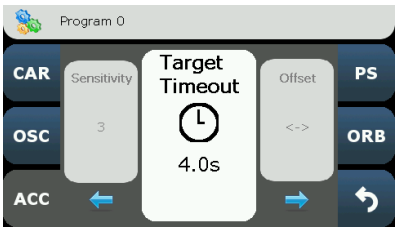




This parameter indicates the sensitivity of the ACC function. The pre-set standard value is 5. The values are adjustable from 1 to 9. The smaller the value,
the more sensitive and the quicker the reaction.
IMPORTANT! If the sensitivity is adjusted too high, this could result in interruptions to the welding process.

T / Target Timeout (dwell time in seconds)

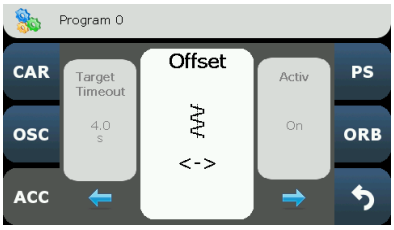




Dwell time after the start of welding, before the ACC module assumes and saves the value for the arc amperage.
The pre-set standard value is 8, but adjustments can be made between 1 and 60 seconds.

Offset

(No screen on the FRC-45 Basic)



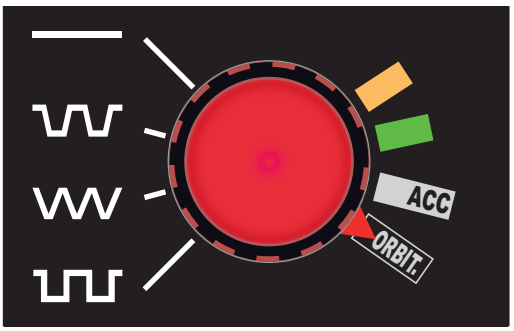
Parameter for the offset movement of the welding torch during the welding process.

ORBITAL function

General

ORBITAL mode is used to set the parameters for welding a pipe.
The Fronius CANOpen i-kit, item number 4,100,251, is also required.

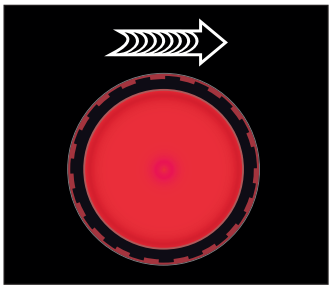
Activating ORBITAL function: FRC-45 Basic remote control



Turn the selector switch on the remote control to the ORBITAL position.

Once the selector switch has been turned to the ORBITAL position, only the following buttons are active:

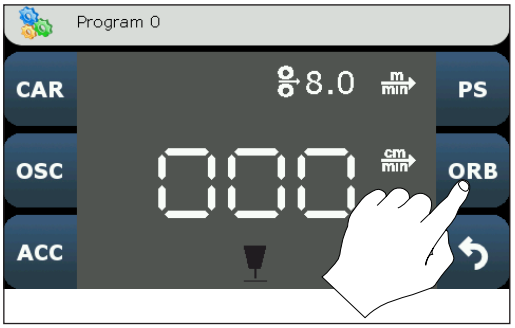
TRAVEL SPEED button



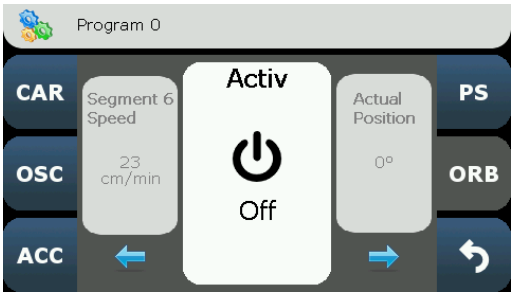
Used in ORBITAL mode for the following functions:

- Selecting the welding parameters
- Changing the value of a parameter
- Confirming the selected value

Activating ORBITAL function: FRC-45 Pro remote control



1. Tap the ORBITAL menu button on the touchscreen.



► The ORBITAL ACTIV ON / OFF parameter is displayed.

2. Tap the parameter field or press the multifunctional dial once.

► The OFF parameter is displayed in blue.
► A button is displayed.

3. To switch to ON either:
   - Touch the button
   - Turn the multifunctional dial
   - Tap the right blue arrow

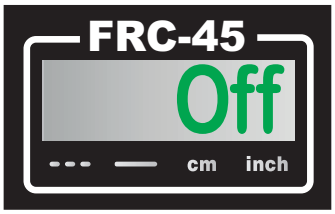
► The button is highlighted in blue, the display changes to ON.

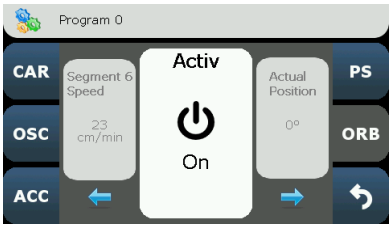
4. To confirm the selection either:
   - Tap the parameter field again
   - Press the multifunctional dial once

Orbital parameters

FRC-45 Basic	FRC-45 Pro

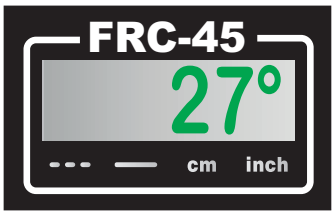
ON / OFF

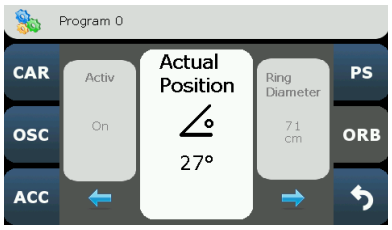




For activating / deactivating the ORBITAL function.

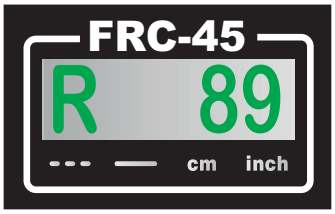
Actual Position (position of the carriage)

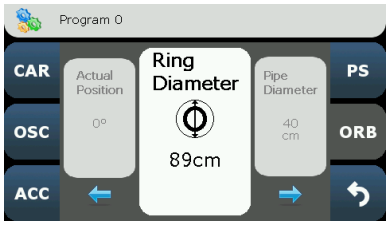




Displays the position of the carriage in relation to the current workpiece.
The display ranges from 0° to 360°. This parameter is only for informational purposes and cannot be altered.

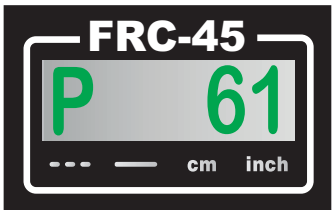
R / Ring Diameter

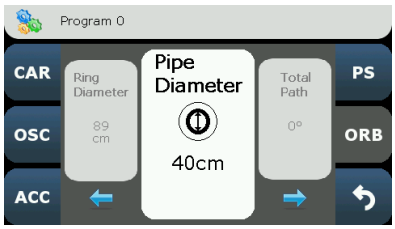




Shows the diameter of the currently used ring-shaped rail in cm.

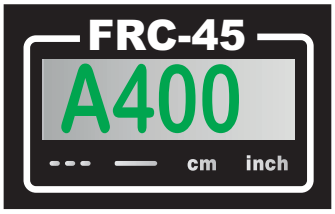
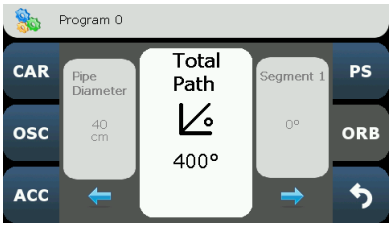
P / Pipe Diameter





Shows the current workpiece diameter in cm.
Both the parameters R and P are used to calculate the welding speed.
IMPORTANT! If one of these two parameters is set at 0, a straight welding movement will be calculated instead of a round one.

Orbital parameters (continued)

FRC-45 Basic	FRC-45 Pro
A / Total Path	
	

Shows the entire welding path in degrees. The maximum value is 900°, which is equal to 2.5 journeys around the workpiece.

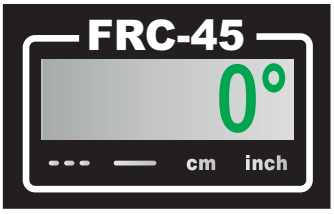
Segment parameters

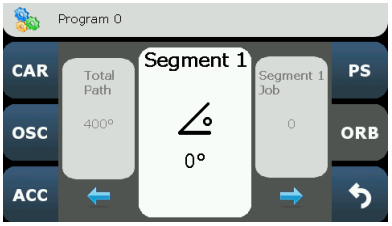
The segment welding function is for welding a round workpiece in up to 16 different segments.
That means that the total welding path A is divided into segments.

IMPORTANT! The following three steps always refer to a single segment.
In the example shown, a segment is welded from 0° to 90° as JOB 1 with a welding speed of 40 cm/min.

FRC-45 Basic	FRC-45 Pro

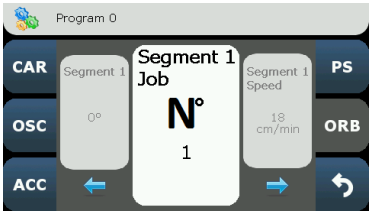
Step 1: End point of the first segment





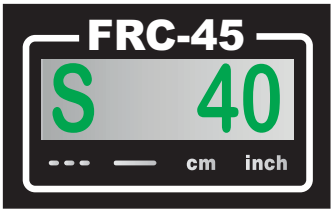
Indicates the end point of the first segment.
Example: Input 90° - the welding torch welds from 0° to 90°.

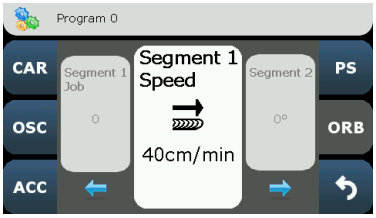
Step 2: Job selection



Selection of jobs for welding the first segment.
Once the end point for the first segment has been reached, the carriage control switches to the job that has been pre-set for segment 2.

Step 3: Welding speed





Displays the pre-set welding speed for the currently selected segment.

Starting welding: FRC-45 Basic

Switching on system components

⚠ WARNING!

Danger of injury from premature arc ignition.

The arc may be ignited accidentally. This can cause serious eye injuries.

- Before switching on the system components, ensure that the “Welding mode” toggle switch on the welding carriage remote control is set to the “O” position.

IMPORTANT! The following switch-on sequence of the system components must be strictly adhered to:

- Switch on the power source and let it completely start up
- Switch on wire feeder (if no supply via power source)

After the power source is fully powered up:

- Switch on the FlexTrack control box

Working with or without an oscillation unit

The welding carriage can work with and without oscillation (linear or radial). If the oscillation unit is not required, it should be removed according to the instructions in the "Preparing the carriage " section under "Replacing the oscillation unit with an adjustment unit".

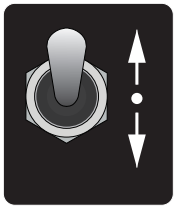
After the control box has been switched on, it automatically checks whether the linear or radial oscillation unit is connected, and the current status appears on the display.

Linear oscillation unit is connected:	Oscillation speed and oscillation path are displayed in [cm/min].
Radial oscillation unit is connected:	Oscillation speed and oscillation path are displayed in [%].

Performing a test run

Perform a test run to check that all system components are working together correctly. The test run is carried out without an arc and allows you to check all the movements during the program sequence.

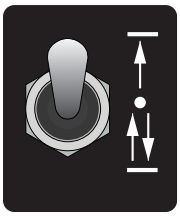
Set the WELDING MODE toggle switch to the 0 position.



Move the TRAVERSING DIRECTION toggle switch forwards.
The carriage moves according to the programmed parameters, but no welding is performed.
The carriage's current speed is then shown on the display. All parameters can be changed during operation.

Performing a test run
(continued)

When the carriage reaches the limit switch:



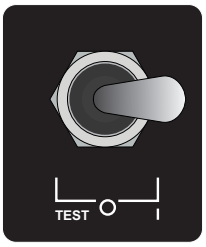
If the CHANGE DIRECTION/STOP toggle switch is forwards:
► The carriage stops when it triggers the limit switch.

If the toggle switch is in the CHANGE DIRECTION position:
► After triggering the limit switch, only the oscillation unit stops, and the welding carriage starts to move back in the opposite direction. In this situation, the travel speed can be increased to the maximum for the return journey: press the travel speed knob and hold for 2 seconds.

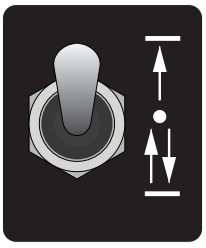
NOTICE!

NOTE! If the TRAVERSING DIRECTION toggle switch is in the central position and the WELDING MODE toggle switch is in the TEST position, this position causes the arc to light up briefly.
Activating the welding function: Set the WELDING MODE toggle switch to the “I” position.

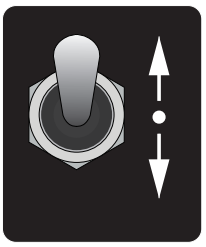
Starting the welding process



Set the WELDING MODE toggle switch to the "I" position.



Set the CHANGE DIRECTION/STOP toggle switch to the position required.



Set the TRAVERSING DIRECTION toggle switch to the position required (forwards or backwards). The welding process starts.

IMPORTANT! Never leave the device unattended during the welding process.

To stop the carriage early, move the TRAVERSING DIRECTION toggle switch to the central position.

Starting welding: FRC-45 Pro

Switching on system components

⚠ WARNING!

Danger of injury from premature arc ignition.

The arc may be ignited accidentally. This can cause serious eye injuries.

- Before switching on the system components, ensure that the “Welding mode” toggle switch on the welding carriage remote control is set to the “O” position.

IMPORTANT! The following switch-on sequence of the system components must be strictly adhered to:

- Switch on the power source and let it completely start up
- Switch on wire feeder (if no supply via power source)

After the power source is fully powered up:

- Switch on the FlexTrack control box

Working with or without an oscillation unit

The welding carriage can work with and without oscillation (linear or radial). If the oscillation unit is not required, it should be removed according to the instructions in the "Preparing the carriage " section under "Replacing the oscillation unit with an adjustment unit".

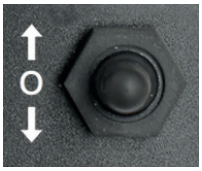
After the control box has been switched on, it automatically checks whether the linear or radial oscillation unit is connected, and the current status appears on the display.

Linear oscillation unit is connected:	Oscillation speed and oscillation path are displayed in [cm/min].
Radial oscillation unit is connected:	Oscillation speed and oscillation path are displayed in [%].

Performing a test run

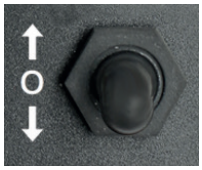
Perform a test run to check that all system components are working together correctly. The test run is carried out without an arc and allows you to check all the movements during the program sequence.

Set the WELDING MODE toggle switch to the 0 position.



Move the TRAVERSING DIRECTION toggle switch forwards.
The carriage moves according to the programmed parameters, but no welding is performed.
The carriage's current speed is then shown on the display. All parameters can be changed during operation.

Starting the welding process

	Set the WELDING MODE toggle switch to the "I" position.
	Set the TRAVERSING DIRECTION toggle switch to the position required (forwards or backwards). The welding process starts. **IMPORTANT!** Never leave the device unattended during the welding process.
	To stop the carriage early, move the TRAVERSING DIRECTION toggle switch to the central position.

Maintenance and disposal

Troubleshooting

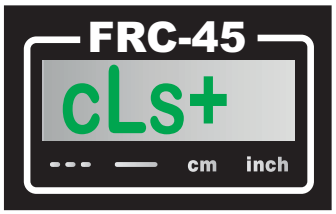
General

In the event of faults, note that the functioning of the entire system depends on many additional components (power source, wirefeeder, etc.) that are also potential sources of problems.
If an error occurs, "Err" and the error number are shown on the display.

Basic requirements for the system to work

- ► Connections have been established between the separate system components
- ► System components are supplied with electricity and the mains voltage for each component complies with the rating plate.

Event codes Remote control FRC-45 Basic



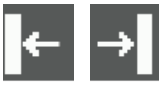
The event codes are displayed as letter and number combinations.

Display	Description	Remedy
cLs- / cLs+	Welding carriage has reached one of the contact cams on the rail.	Release the limit switch using the traversing direction toggle switch
oLs- / oLs+	The oscillation arm has reached a limit position.	Release the limit switch using the offset knob.
cm	Metric system selected.	To change the setting: see the "FRC-45 Basic remote control" section under "Changing the units of measurement".
inch	Imperial system selected.	
mem0 - mem9	Save or load a welding program.	--

FRC-45 Pro remote control event codes

The event codes are displayed as symbols on the main screen.

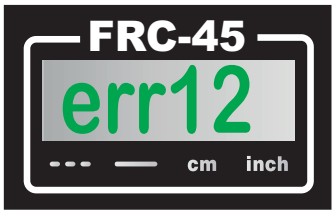
FRC-45 Pro remote control event codes (continued)

Display	Description	Remedy
	Welding carriage has reached one of the contact cams on the rail.	Release the limit switch using the traversing direction toggle switch
	The oscillation arm has reached a limit position.	Release the limit switch using the offset knob.
	Status display WITH / WITHOUT WELDING	--
	Display cm / min or inch / min. This value is displayed on the main screen next to the travel speed.	To change the setting: see the "FRC-45 Pro remote control" section under "Changing the units of measurement".

Error code display

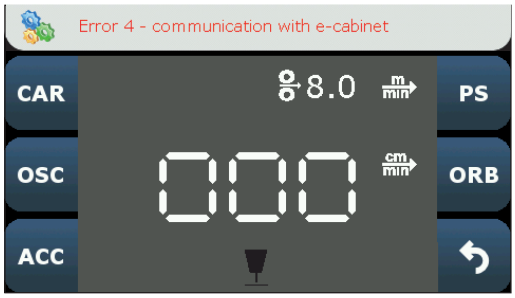
FRC-45 Basic

Error codes are numbered and displayed with ERR and the relevant error number.



FRC-45 Pro

The error code is displayed as plain text in the header of the main screen, along with a short description.



Error codes

Display	Description	Remedy
err1 Error 1	Error during initiation of the CAN communication system.	Rectify short circuit between the lines or communication ports.
err2 Error 2	Communication error between carriage and remote control.	Check connections, tighten if necessary. If necessary, replace damaged control lines.
err3 Error 3	Communication error between remote control and oscillation unit.	
err4 Error 4	Communication error between remote control and control box.	
err5 Error 5	Error while saving or reading, memory error on the remote control.	Contact your FRONIUS service technician.
err6 Error 6	Operating temperature exceeded or ambient temperature too high.	Allow device to cool down. Operate in a lower ambient temperature.
err7 Error 7	Error in motor control unit.	Contact your FRONIUS service technician.
err8 Error 8	Error in oscillation control unit.	Contact your FRONIUS service technician.
err9 Error 9	Error in the control unit in the control box.	Contact your FRONIUS service technician.

Error codes
(continued)

Display	Description	Remedy
Err 10 Error 10	Error while the display is starting up.	Contact your FRONIUS service technician.
Err 11 Error 11	Communication error between ACC module and remote control.	Check connections; if necessary, tighten screw fittings. If necessary, replace defective connection lines.
Err 12 Error 12	Error in the ACC module.	Contact your FRONIUS service technician.
Err 13 Error 13	Communications error between the CANopen robot interface module installation kit and the remote control.	Check connections; if necessary, tighten screw fittings. If necessary, replace defective connection lines.
Err 14 Error 14	Error in the CANopen robot interface module installation kit.	Contact your FRONIUS service technician.

Maintenance

Maintenance personnel

⚠ WARNING!

Risk of injury and damage from incorrectly performed maintenance work.

It is essential to adhere to the maintenance intervals and maintenance procedures. The manufacturer accepts no liability for any damage caused by inadequate or poorly performed maintenance.

- All maintenance work on the welding carriage must be carried out by trained technicians.

Electrically skilled person (electrician):

Person who, due to specialist training, knowledge and experience of the relevant regulations, is able to evaluate the tasks assigned to him/her and to identify and avoid potential hazards.

Electrically instructed person:

Person adequately advised or supervised by skilled persons to enable him or her to perceive risks and to avoid hazards which electricity can create and to understand the necessary safety precautions and protection devices.
Note: Instruction must be recorded in writing.

Electrical layperson:

Someone who is neither a skilled person nor an instructed person.

Maintenance record

The following measures regarding maintenance must be put in place by the plant operator:

- a service book containing the required information (date, operator, maintenance work carried out) must be kept.

Recommended lubricants

IMPORTANT! Lubricants with solid lubricant additives (e.g.: MoS2, graphite and PTFE) are not suitable for guiding systems.

Lubricant	DIN	DIN number	Comment
Grease	KP 2-K	51502 / 51825	Lithium soap grease
Lubricating oil	CLP32-100	51517 Part 3	ISO VG 32-100

Maintenance intervals and procedures

NOTICE!

Use a dry cleaning cloth to clean the machine components. Only use a cleaning agent if this is indicated in the maintenance procedure for a specific part.

Item	Component	Measure	Interval
A	Linear guides	Clean, check oil film	M
B	Gearbox	Clean, regrease	M
C	Rack and pinion	Clean, regrease	M
D	Rollers, underbody & rails	Clean, check position	M
E	Safety devices: - Limit switch	Function test	D
F	Grease nipples	Regrease	M
G	Connection contacts	Clean	W

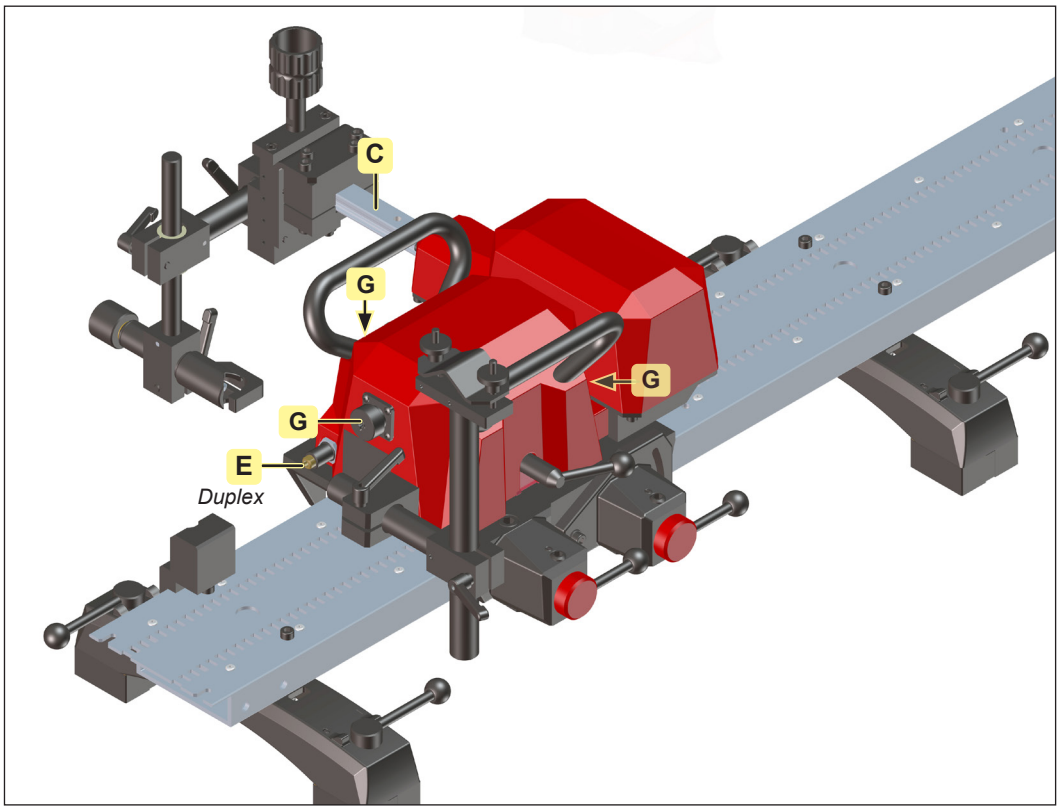
D	*Daily*	*1/2 Y*	*Half-yearly*
W	*Weekly*	*Y*	*Annually*
M	*Monthly*		

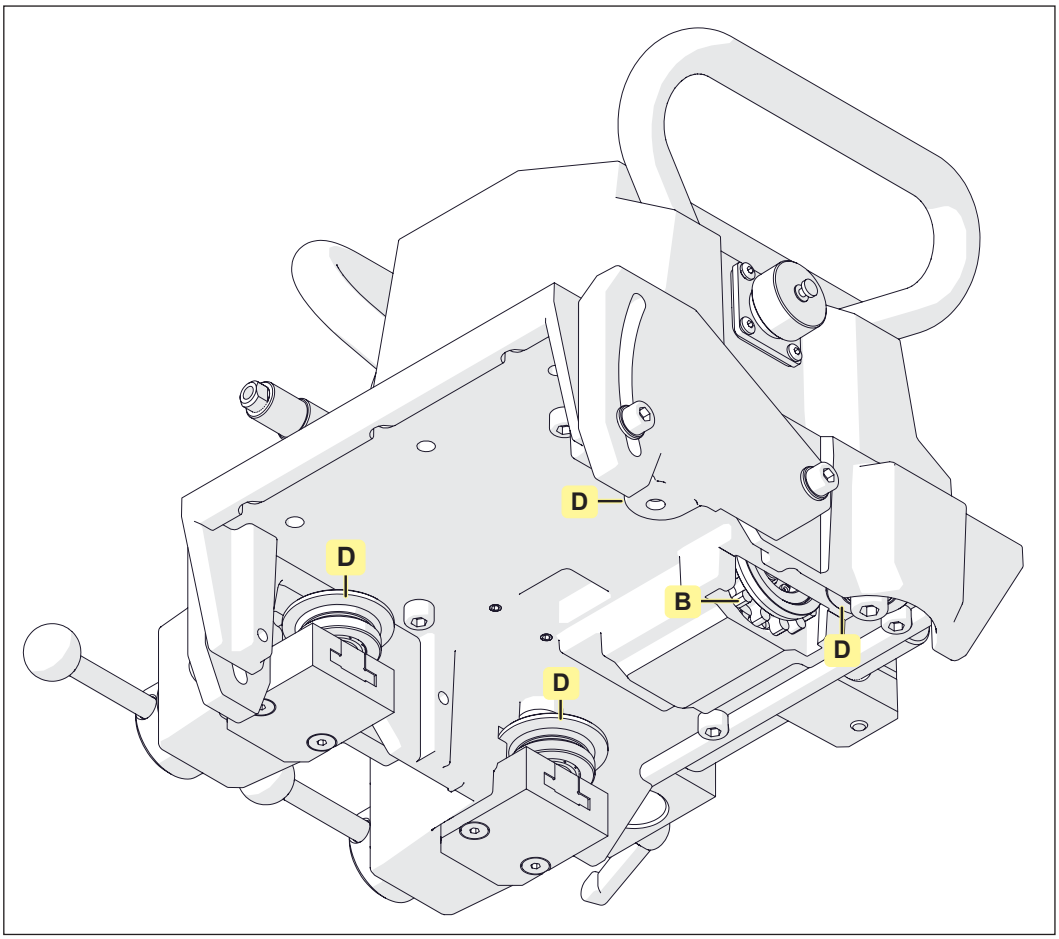
Daily care:

After every use:

- ► Remove the welding carriage from the guide rail.
- ► Using a brush or a soft cloth, clean the guide rails for the oscillation unit, the guide rollers and the gearbox.
- ► Carry out maintenance work as shown in the illustration below.

IMPORTANT! Do not use compressed air.





Clean and lubricate the gearbox wheel:

IMPORTANT! The gearbox must be cleaned and lubricated once a month (B):

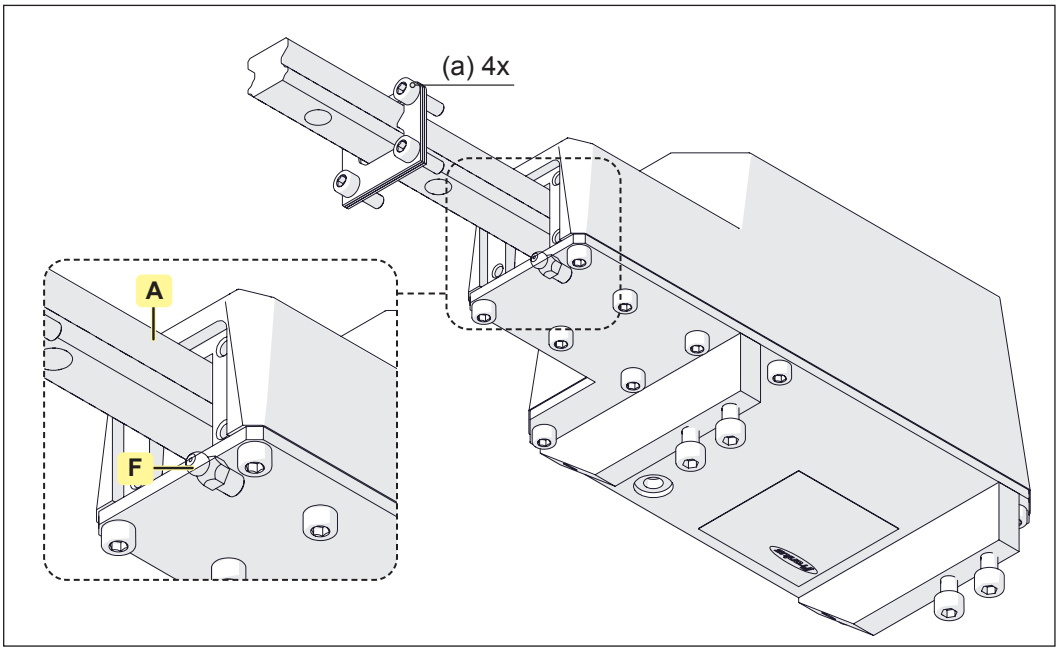
1. Clean the gear wheel with a brush
2. Lubricate with grease

Maintain the bottom of the carriage:

Clean the guide rollers (D)

Maintenance on the linear oscillation unit

IMPORTANT! The toothed rack on the oscillation unit must be lubricated once a month.
The guide rail must be lubricated every six months.



1. Fully extend the oscillation arm.
2. Undo the four M5 screws (a) and remove the guide rail cover.
3. Clean the linear guide with a brush (A).
4. Lubricate the linear guide on the side of the oscillation unit housing.
5. Add approximately 2 g of lubricant to the grease cup via the Ø 12 mm grease nipple (F).

Maintenance on the radial oscillation unit

Daily:

Clean the oscillation unit after use, remove any welding spatter or smoke residue.

Every two years:

If necessary, top up the gear grease.

Maintenance of the FMS slides

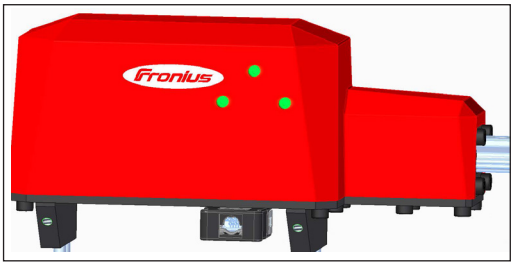
Daily:

Clean the FMS slide after use, remove any welding spatter or smoke residue.

Every six months:

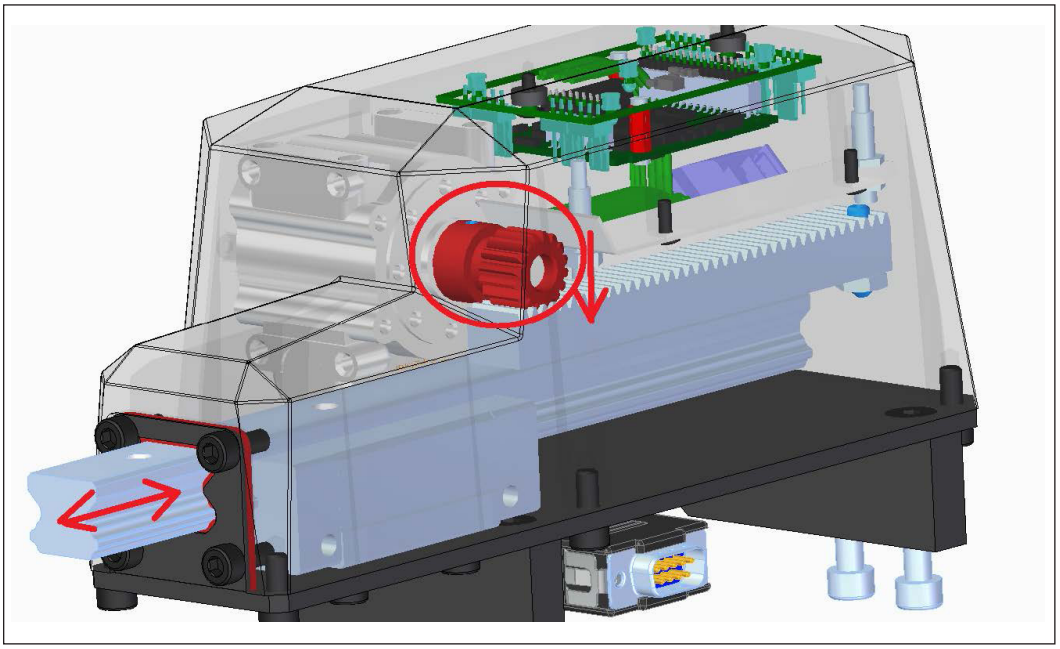
Regrease guides.

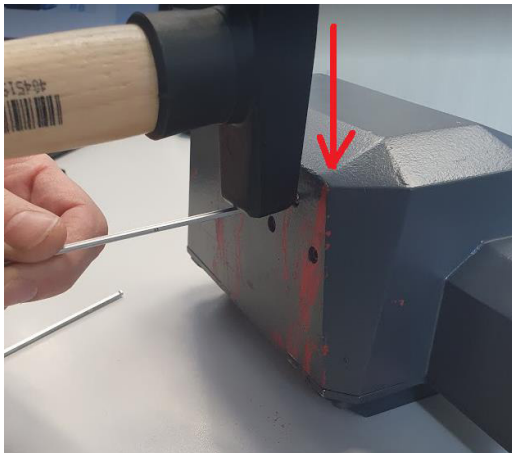
Adjusting the gear rack play



1. Loosen the three motor bolts (marked in green in the image) using a 2.5 mm Allen key.
   IMPORTANT! Only loosen them, DO NOT unscrew them completely.

2. Move the arm of the oscillation gently forwards and backwards to find the largest gap between the gear and the gear rack.
   This is important so that the motor can move down to the lowest possible position in the next step.





3. Tighten the three bolts slightly using the 2.5 mm Allen key.
4. Insert the Allen key into the socket of the top bolt and tap it carefully using a hammer.
5. Repeat this process with the bottom two bolts.
6. Fully tighten the bolts.

7. Alternative: tighten the three bolts slightly.
   Hit the bottom of the oscillation on a flat surface so the gravitational force causes the motor to move down.

Technical data

Technical data

FlexTrack 45 PRO Carriage

Welding position	PA, PB, PC, PF, PG
Material thickness	min. 4 mm (min. 0.15 in)
Horizontal traversing speed	5 - 300 cm/min (1.96 - 118.11 in.)
Vertical traversing speed	5 - 250 cm/min (1.96 - 98.42 in.)
End-crater filling time	0 - 5 seconds
Max. load, horizontal/vertical	45 / 30 kg (99.20 / 66.13 lb)
Weight (without torch holder)	8.5 kg (18.74 lb)
Protection class	IP 23

Control box

Mains voltage 50 - 60 Hz	115/230 V
Supply voltage	24 V DC
Weight (without cables)	4.6 kg (10.15 lb)
Protection class	IP 23

FRC-45 Basic and FRC-45 Pro

Cable length	10 m (393.70 in.)
Weight (without cables)	1.5 kg (3.30 lb)
Protection class	IP23
Operating temperature	0 – 50°C

Linear oscillation unit

Oscillation speed	5 - 400 cm/min (1.97 - 157.48 in/min)
Oscillation path	2 - 30 mm (0.079 - 1.2 in)
Offset	0 - 50 mm (0 - 2 in.)
Dwell time	0 - 3 seconds
Weight (without torch holder)	3.2 kg (7.05 lb)
Protection class	IP 23

Radial oscillation unit

Oscillation speed (at 150 mm radius)	20 - 120 cm/min (7.78 - 47.24 in.)
Oscillation path (at 150 mm radius)	1 - 30 mm (0.039 - 1.18 in.)
Offset	0 - 50 mm (0 - 1.97 in.)
Dwell time	0 - 3 seconds
Weight (with torch holder)	3.6 kg (7.94 lb)
Protection class	IP 23

FMS 100/ ML15/SE/ACC (optional)

Max. load capacity	15 kg (33.06 lb)
Control voltage	24 VDC
Power consumption	8 W
Traversing speed (automatic mode)	30 cm / min (11.8 in)
Traversing speed (manual mode)	max. 1 m / min (39.37 in)
Travel path	0.5 - 100 mm (0.01 - 3.93 in.)
Degrees of sensitivity	1-9
Dwell time	1 - 60 s
Degree of protection	IP 23
Unladen weight	2.45 kg (5.40 lbs)

IMPORTANT! The ACC module may only be used with the TPS power source.

FMS 50/ML15/SE/ ACC (optional)

Max. load capacity	15 kg (33.06 lb)
Control voltage	24 VDC
Power consumption	8 W
Traversing speed (automatic mode)	30 cm / min (11.8 in)
Traversing speed (manual mode)	max. 1 m / min (39.37 in)
Travel path	max. 50 mm (1.96 in.)
Degrees of sensitivity	1-9
Dwell time	1-60s
Degree of protection	IP 23
Unladen weight	2 kg (4.40 lb)

IMPORTANT! The ACC module may only be used with the TPS power source.

Environmental conditions

Operation or storage of the carriage outside the stipulated area will be deemed as improper use. The manufacturer shall not be held liable for any damage arising from such usage.

Ambient air temperature range:
- during operation: +0°C to +50°C (32°F to 122°F)
- during transport and storage: -20 °C to +55 °C (-4 °F to 131 °F)

Relative humidity:
- up to 50% at 40 °C (104 °F)
- up to 90% at 20 °C (68 °F)

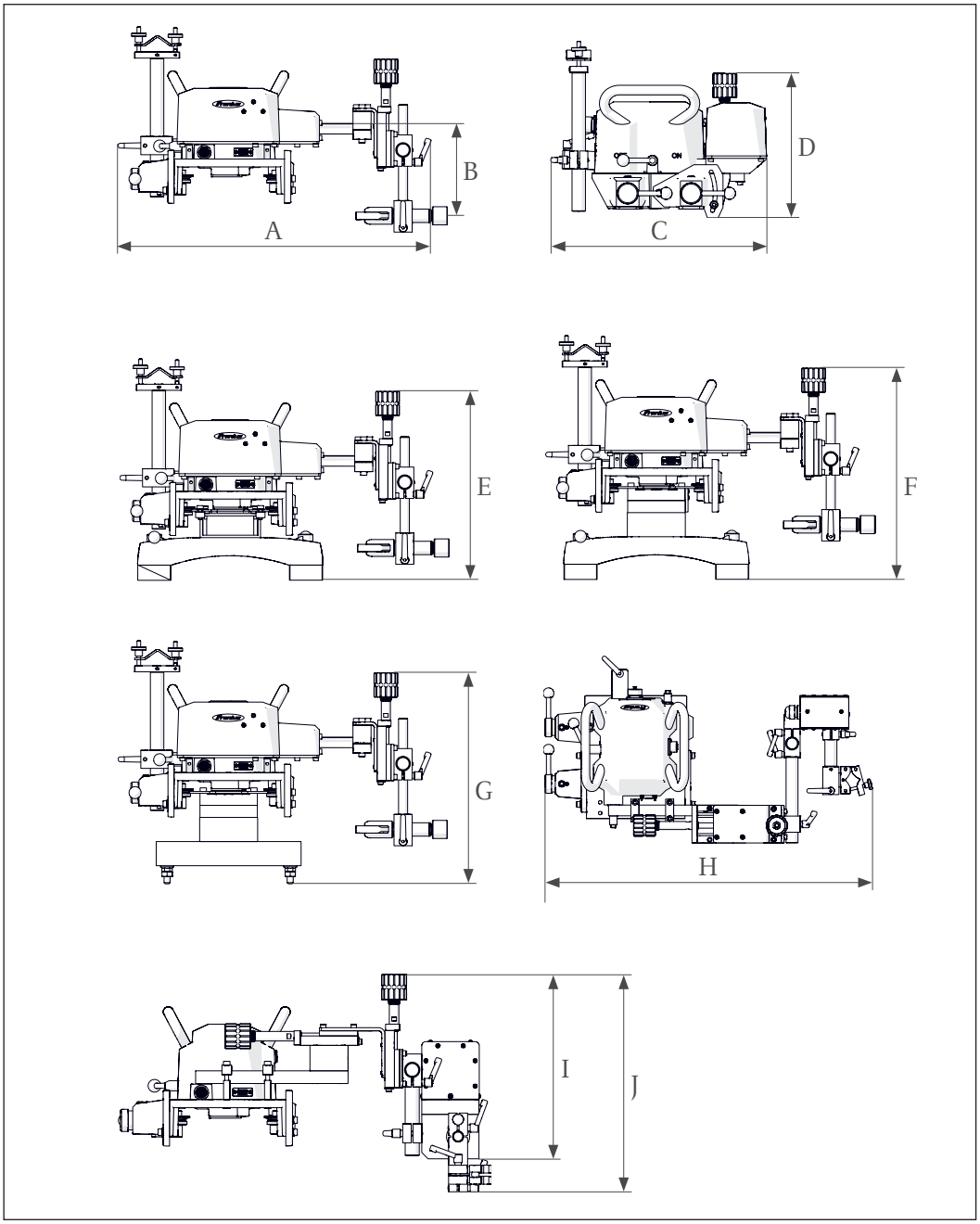
Keep ambient air free from dust, acids, corrosive gases and substances, etc.
Can be used at altitudes of up to 2000 m (6561 ft. 8.16 in.)

Noise data

When used for its intended purpose, the machine generates a maximum sound power level of > 80 dB(A) (ref. 1pW) as measured according to EN ISO 11201.
It is not possible to provide an exact emission value as this is influenced by both the process and the environment, depending on:
- the welding process (MIG/MAG, TIG welding)
- the type of power selected (DC or AC)
- the power range
- the type of weld metal
- the resonance characteristics of the workpiece
- the workplace environment, etc.

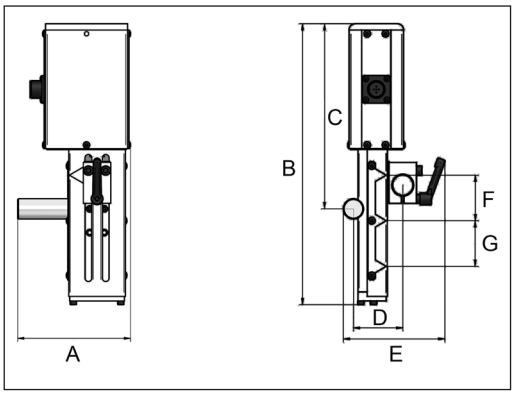
► Wear ear protection to reduce the harmful effects of noise.

Dimensions



Dimensions with linear oscillation unit		
A	(with oscillation unit)	469 - 556 mm
	(without oscillation unit)	452 - 542 mm
B	(with oscillation unit)	56 - 240 mm
	(without oscillation unit)	80 - 263 mm
C	(with oscillation unit)	357 mm
	(without oscillation unit)	342 mm
D	(with oscillation unit)	239 mm
	(without oscillation unit)	270 mm
E	(overall height with straight, rigid rails)	313 mm
F	(overall height with magnetic bridge)	310 - 408 mm
G	(overall height with adjustable foot bridge)	310 - 408 mm
Dimensions with radial oscillation unit		
H	(with oscillation unit)	543 - 653 mm
	(without oscillation unit)	452 - 542 mm
I	(with oscillation unit)	191 - 311 mm
	(without oscillation unit)	80 - 263 mm
J	(with oscillation unit)	243 - 363 mm

FMS slide dimensions



FMS slide dimensions	
A	124 mm (4.88 in.)
B	308 mm (12.13 in.)
C	203 mm (7.99 in.)
D	54 mm (2.13 in.)
E	111 mm (4.37 in.)
F	50 mm (1.97 in.)
G	50 mm (1.97 in.)

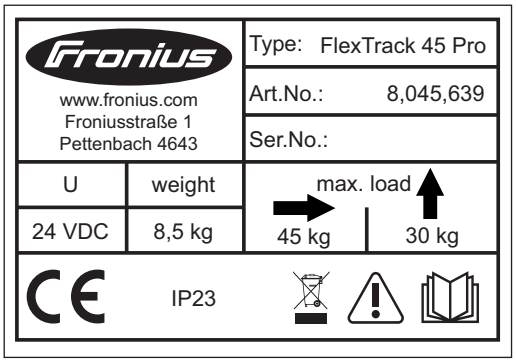
Weights of rails and bridges

Magnetic bridge	2.5 kg (5.5 lb)
Vacuum bridge	1.6 kg (3.5 lb)
Magnetic bridge with spacers	2.7 kg (5.9 lb)
Vacuum bridge with spacers	1.8 kg (3.9 lb)
Magnetic bridge with spacer and metric adjustment unit	3.4 kg (7.4 lb)
Magnetic bridge with metric adjustment unit	3.2 kg (7.05 lb)
Bridge with adjustable foot, spacer and metric adjustment unit	1.5 kg (3.3 lb)
Bridge with adjustable foot and metric adjustment unit	1.3 kg (2.8 lb)
Vacuum bridge with spacer and metric adjustment unit	2.6 kg (5.7 lb)
Vacuum bridge with metric adjustment unit	2.4 kg (5.2 lb)
Rigid guide rail 1884 mm	11 kg (24.3 lb)
Flexible guide rail 1884 mm	5.5 kg (12.1 lb)
Flexible guide rail 1695 mm	4.8 kg (10.5 lb)
Flexible guide rail 1130 mm	3.3 kg (7.2 lb)
Rigid ring rail Ø200-300 mm	8.8 kg (19.4 lb)
Rigid ring rail Ø300-480 mm	11 kg (24.3 lb)
Rigid ring rail Ø480-660 mm	14 kg (30.8 lb)
Rigid ring rail Ø660-840 mm	16 kg (35.3 lb)
Rail segment Ø840-1020 mm	19 kg (41.8 lb)
Rail segment Ø1020-1200 mm	22 kg (48.5 lb)
Rail segment Ø1200-1380 mm	24 kg (52.9 lb)
Rail segment Ø1380-1560 mm	27 kg (59.5 lb)

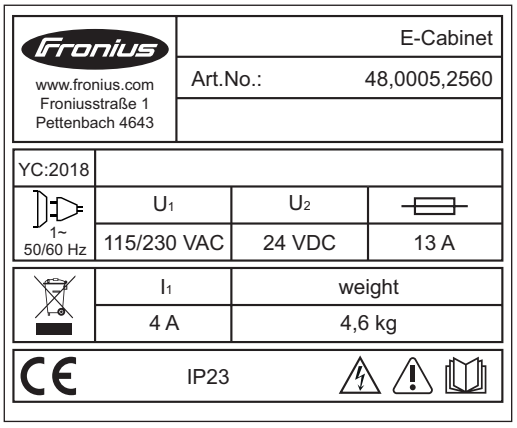
Rating plates

NOTICE!

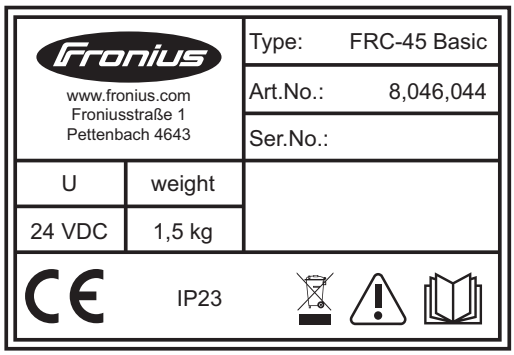
The rating plates may not be removed or modified without the consent of Fronius International GmbH. Ensure that the rating plates remain legible.



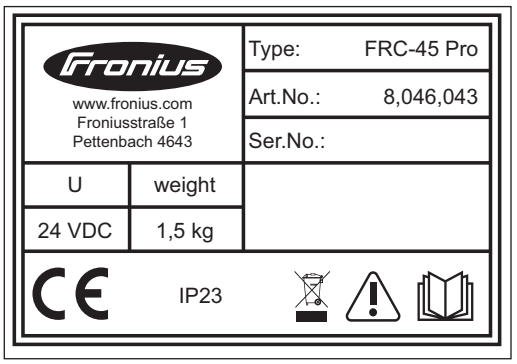
Rating plate, welding carriage



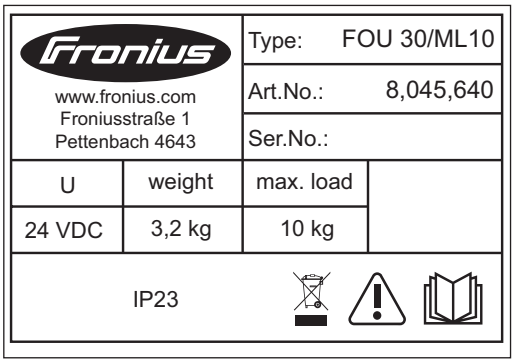
Rating plate, control box



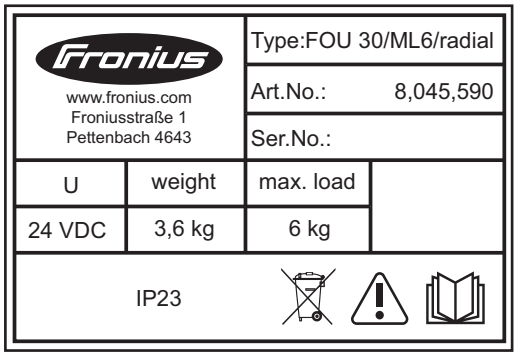
Rating plate, BASIC remote control



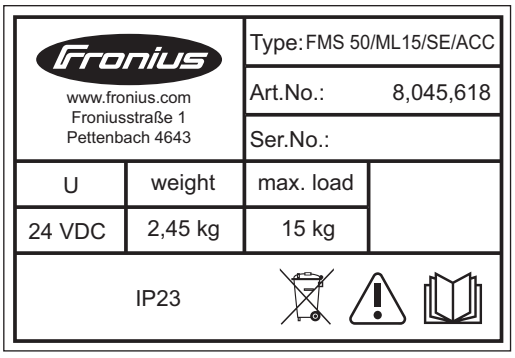
Rating plate, PRO remote control



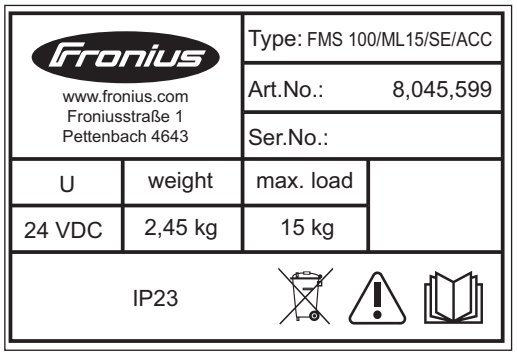
Rating plate, linear oscillation unit



Rating plate, radial oscillation unit



Rating plate, FMS 50



Rating plate, FMS 100

All illustrations of rating plates are representative images.

Ring rail settings table

IMPORTANT! A quick-reference summary of the settings table, showing the most important settings, can be found on the inside of the transport box lid.

Ø Round guide rail [mm]	Ø Workpiece Dp [mm]	Min. Ø for bridges with spacer block Dp_{min} [mm]	Max. Ø for bridges with spacer block Dp_{max} [mm]	Min. Ø for bridges without spacer block Dp_{min} [mm]	Max. Ø for bridges without spacer block Dp_{max} [mm]	Number bridges	Distance M on adjustment unit	$V_{carriage} = D_{rail} * Vw / D_{workpiece}$ [cm/min] *Vw = welding speed [cm/min]*
200-300	200-300	192	308			3	196-0.5•Dp	537*Vw/Dp
300-480	300-400	296	412			4	245-0.5•Dp	718*Vw/Dp
	380-480			376	492		285-0.5•Dp	
480-660	480-580	476	592			6	335-0.5•Dp	900*Vw/Dp
	560-660			556	672		375-0.5•Dp	
660-840	660-760	655	771			8	425-0.5•Dp	1080*Vw/Dp
	740-840			735	851		465-0.5•Dp	
840-1020	840-940	835	951			9	515-0.5•Dp	1260*Vw/Dp
	920-1020			915	1031		555-0.5•Dp	
1020-1200	1020-1120	1015	1131			12	605-0.5•Dp	1440*Vw/Dp
	1100-1200			1095	1211		645-0.5•Dp	
1200-1380	1200-1300	1195	1311			15	695-0.5•Dp	1620*Vw/Dp
	1280-1380			1275	1391		735-0.5•Dp	
1380-1560	1380-1480	1375	1491			16	785-0.5•Dp	1800*Vw/Dp
	1460-1560			1455	1571		825-0.5•Dp	

Ø Round guide rail [mm]	Ø Workpiece Dp [mm]	Min. Ø for bridges with spacer block Dp_{min} [mm]	Max. Ø for bridges with spacer block Dp_{max} [mm]	Min. Ø for bridges without spacer block Dp_{min} [mm]	Max. Ø for bridges without spacer block Dp_{max} [mm]	Number bridges	Distance M on the adjustment unit	$V_{carriage} = D_{rail} * Vw / D_{workpiece}$ [cm/min] *Vw = welding speed [cm/min]*
1560-1740	1560-1660	1555	1671			18	875-0.5*Dp	
	1640-1740			1635	1751		915-0.5*Dp	1980*Vw/Dp
1740-1920	1740-1840	1735	1851			18	965-0.5*Dp	
	1820-1920			1815	1931		1005-0.5*Dp	2160*Vw/Dp
1920-2100	1920-2020	1915	2031			20	1055-0.5*Dp	
	2000-2100			1995	2111		1095-0.5*Dp	2340*Vw/Dp
2100-2280	2100-2200	2095	2211			21	1145-0.5*Dp	
	2180-2280			2175	2291		1185-0.5*Dp	2520*Vw/Dp
2280-2460	2280-2380	2275	2391			25	1235-0.5*Dp	
	2360-2460			2355	2471		1275-0.5*Dp	2700*Vw/Dp
2460-2640	2460-2560	2455	2570			25	1325-0.5*Dp	
	2540-2640			2535	2651		1365-0.5*Dp	2880*Vw/Dp
2640-2820	2640-2740	2634	2750			28	1415-0.5*Dp	
	2720-2820			2714	2830		1455-0.5*Dp	3060*Vw/Dp
2820-3000	2820-2920	2814	2930			30	1505-0.5*Dp	
	2900-3000			2894	3010		1545-0.5*Dp	3240*Vw/Dp
3000-3180	3000-3100	2994	3110			30	1595-0.5*Dp	
	3080-3180			3074	3190		1635-0.5*Dp	3420*Vw/Dp
3180-3360	3180-3280	3174	3290			30	1685-0.5*Dp	
	3260-3360			3254	3370		1725-0.5*Dp	3600*Vw/Dp
3360-3540	3360-3460	3354	3470			33	1775-0.5*Dp	
	3440-3540			3434	3550		1815-0.5*Dp	3780*Vw/Dp
3540-3720	3540-3640	3534	3650			33	1864-0.5*Dp	
	3620-3720			3614	3730		1904-0.5*Dp	3960*Vw/Dp
3720-3900	3720-3820	3714	3830			35	1954-0.5*Dp	
	3800-3900			3794	3910		1994-0.5*Dp	4140*Vw/Dp
3900-4080	3900-4000	3894	4010			36	2044-0.5*Dp	
	3980-4080			3974	4090		2084-0.5*Dp	4320*Vw/Dp

Ø Round guide rail [mm]	Ø Workpiece Dp [mm]	Min. Ø for bridges with spacer block Dp_{min} [mm]	Max. Ø for bridges with spacer block Dp_{max} [mm]	Min. Ø for bridges without spacer block Dp_{min} [mm]	Max. Ø for bridges without spacer block Dp_{max} [mm]	Number bridges	Distance M on the adjustment unit	$V_{carriage} = D_{rail} * Vw / D_{workpiece}$ [cm/min] *Vw = welding speed [cm/min]*
4080-4260	4080-4180	4074	4190			38	2134-0.5*Dp	
	4160-4260			4154	4270		2174-0.5*Dp	4500*Vw/Dp
4260-4440	4260-4360	4254	4370			40	2224-0.5*Dp	
	4340-4440			4334	4450		2264-0.5*Dp	4680*Vw/Dp
4440-4620	4440-4540	4434	4550			41	2314-0.5*Dp	
	4520-4620			4514	4630		2354-0.5*Dp	4860*Vw/Dp
4620-4800	4620-4720	4613	4729			43	2404-0.5*Dp	
	4700-4800			4693	4809		2444-0.5*Dp	5040*Vw/Dp
4800-4980	4800-4900	4793	4909			45	2494-0.5*Dp	
	4880-4980			4873	4989		2534-0.5*Dp	5220*Vw/Dp
4980-5160	4980-5080	4973	5089			45	2594-0.5*Dp	
	5060-5160			5053	5169		2624-0.5*Dp	5400*Vw/Dp
5160-5340	5160-5260	5153	5269			48	2674-0.5*Dp	
	5240-5340			5233	5349		2714-0.5*Dp	5580*Vw/Dp
5340-5520	5340-5440	5333	5449			48	2764-0.5*Dp	
	5420-5520			5413	5529		2808-0.5*Dp	5760*Vw/Dp
5520-5700	5520-5620	5513	5629			50	2854-0.5*Dp	
	5600-5700			5593	5709		2894-0.5*Dp	5940*Vw/Dp
5700-5880	5700-5800	5693	5809			51	2944-0.5*Dp	
	5780-5880			5773	5889		2984-0.5*Dp	6120*Vw/Dp
5880-6060	5880-5980	5873	5989			53	3034-0.5*Dp	
	5960-6060			5953	6069		3074-0.5*Dp	6300*Vw/Dp

Spare parts, Circuit Diagram

Spare parts

Spare parts, wearing parts and auxiliary materials

Using spare parts and wearing parts from third-party manufacturers may pose risks. Use approved Fronius original spare parts only.
The manufacturer cannot accept any liability for damage resulting from the use of spare or wearing parts or auxiliary materials that are not approved by the manufacturer.

Details required when placing orders

NOTICE!

Only trained technicians may change parts and may only do so after having read the installation and dismantling instructions supplied.

When ordering spare parts, you should provide the following data:
- Item number as per Spare Parts List
- Model name of the device
- Serial number of the device (shown on the rating plate)

Carriage and accessories:

8,045,639	FlexTrack 45 Pro
48,0005,2614	Control box
8,045,641	FGU 8/SD80-28
8,045,640	FOU 30/ML10
8,045,590	FOU 30/ML6/radial
8,045,581	FGU 9/SD28
8,046,044	FRC-45 Basic
8,046,043	FRC-45 Pro
8,100,224	I-kit actuating cam
8,045,599	FMS 100/ML15/SE/ACC
8,045,618	FMS 50/ML15/SE/ACC

48,0005,1752	FTH 18/D16-25
48,0005,1753	FTH 19/D22-35
48,0005,1776	FTH 18
48,0005,1777	FTH 21

Connection cable:

38,0100,0433	Remote control cable Remote control cable: male plug: 48,0005,2086 Remote control cable: female plug: 48,0005,2087 Remote control cable strain-relief device: 48,0005,2191
38,0100,0459	FMS connection cable 0.8 m
38,0100,0457	CANopen connection cable 5 m
38,0100,0458	Y-splitter, 2-way, 0.3 m
48,0005,2839	Control box connection cable – power source, straight plug, 10 m
48,0005,1850	Control box connection cable – power source, straight plug, 20 m

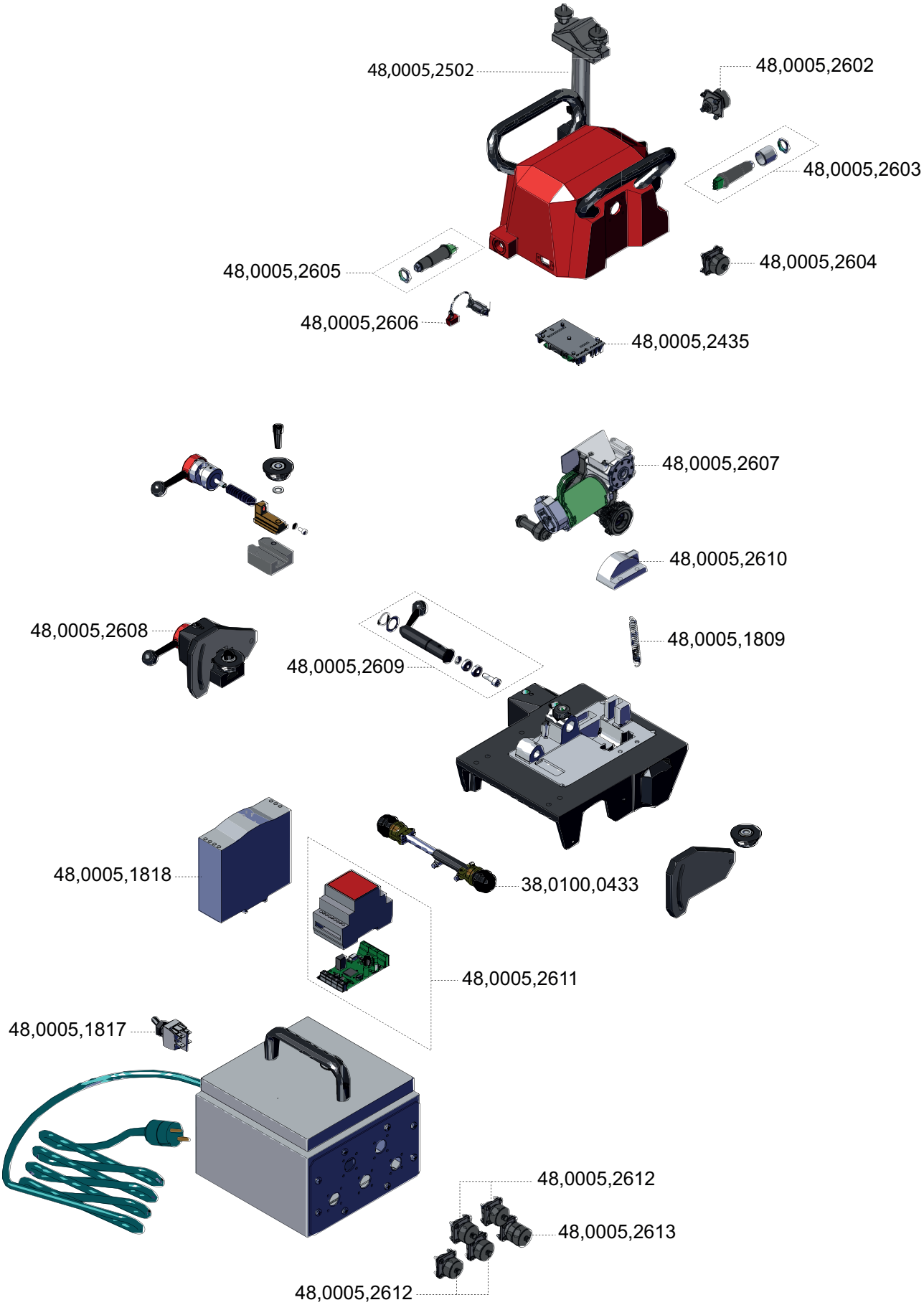
Rails, bridges and ring rails for variable workpiece diameters:

48,0005,1754	Rail, straight 1884 mm	(74.17 inch)	incl. joining elements
48,0005,1755	Magnetic bridge /1		
48,0005,1756	Rail, flexible 1130 mm	(44.49 inch)	incl. joining elements
48,0005,1757	Rail, flexible 1695 mm	(66.73 inch)	incl. joining elements
48,0005,1758	Rail, flexible 1884 mm	(74.17 inch)	incl. joining elements
48,0005,1759	Magnetic bridge /2		
48,0005,1760	Ring rail, rigid 200-300 mm	(7.87 - 11.81 inch)	
48,0005,1761	Ring rail, rigid 300-480 mm	(11.81 - 18.89 inch)	
48,0005,1762	Ring rail, rigid 480-660 mm	(18.89 - 25.98 inch)	
48,0005,1763	Ring rail, rigid 660-840 mm	(25.98 - 33.07 inch)	
48,0005,1764	Point support, adjustable		
48,0005,1765	Ring rail, rigid 840-1020 mm	(33.07 - 40.15 inch)	
48,0005,1766	Ring rail, rigid 1020-1200 mm	(40.15 - 47.24 inch)	
48,0005,1767	Ring rail, rigid 1200-1380 mm	(47.24 - 54.33 inch)	
48,0005,1768	Ring rail, rigid 1380-1560 mm	(54.33 - 61.41 inch)	
48,0005,1769	Magnetic bridge, adjustable /1		
48,0005,1770	Magnetic bridge, adjustable /2		
48,0005,1771	Vacuum bridge		
48,0005,1792	Vacuum bridge with support		
48,0005,1793	Point support, adjustable /2		

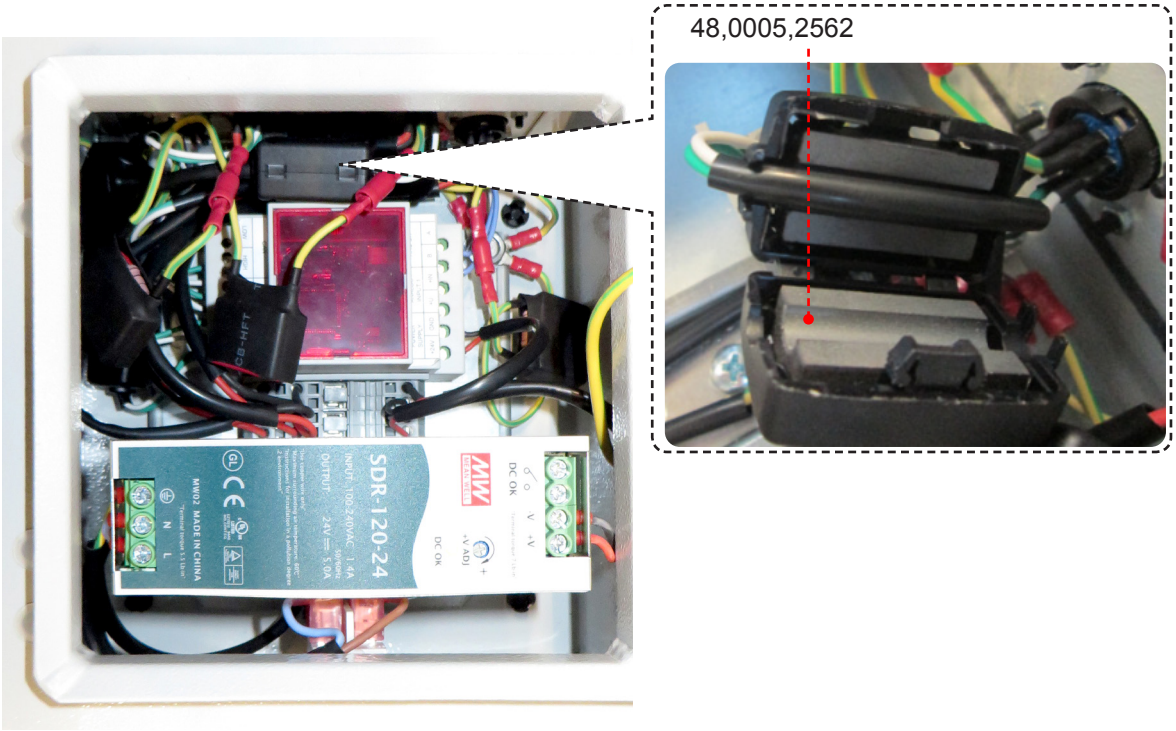
Ring rail for defined workpiece diameters:

48,0005,2511	Ring rail 254 mm (10 inch)	48,0005,2529	Ring rail 1168.4 mm (46 inch)
48,0005,2512	Ring rail 304.8 mm (12 inch)	48,0005,2530	Ring rail 1219.2 mm (48 inch)
48,0005,2513	Ring rail 355.6 mm (14 inch)	48,0005,2531	Ring rail 1270 mm (50 inch)
48,0005,2514	Ring rail 406.4 mm (16 inch)	48,0005,2532	Ring rail 1320.8 mm (52 inch)
48,0005,2515	Ring rail 457.2 mm (18 inch)	48,0005,2535	Ring rail 1371.6 mm (54 inch)
48,0005,2516	Ring rail 508 mm (20 inch)	48,0005,2536	Ring rail 1422.4 mm (56 inch)
48,0005,2517	Ring rail 58.8 mm (22 inch)	48,0005,2537	Ring rail 1473.2 mm (58 inch)
48,0005,2518	Ring rail 609.6 mm (24 inch)	48,0005,2538	Ring rail 1524 mm (60 inch)
48,0005,2519	Ring rail 660.4 mm (26 inch)	48,0005,2539	Ring rail 1574.8 mm (62 inch)
48,0005,2520	Ring rail 711.2 mm (28 inch)	48,0005,2540	Ring rail 1625.6 mm (64 inch)
48,0005,2521	Ring rail 762 mm (30 inch)	48,0005,2541	Ring rail 1676.4 mm (66 inch)
48,0005,2522	Ring rail 812.8 mm (32 inch)	48,0005,2542	Ring rail 1727.2 mm (68 inch)
48,0005,2523	Ring rail 863.6 mm (34 inch)	48,0005,2543	Ring rail 1778 mm (70 inch)
48,0005,2524	Ring rail 914.4 mm (36 inch)		
48,0005,2525	Ring rail 965.2 mm (38 inch)	48,0005,2533	Magnetic bridge ring rail, height adjustment: 10 mm
48,0005,2526	Ring rail 1016 mm (40 inch)	48,0005,2534	Spring holder ring rail
48,0005,2527	Ring rail 1066.8 mm (42 inch)		
48,0005,2528	Ring rail 1117.6 mm (44 inch)		

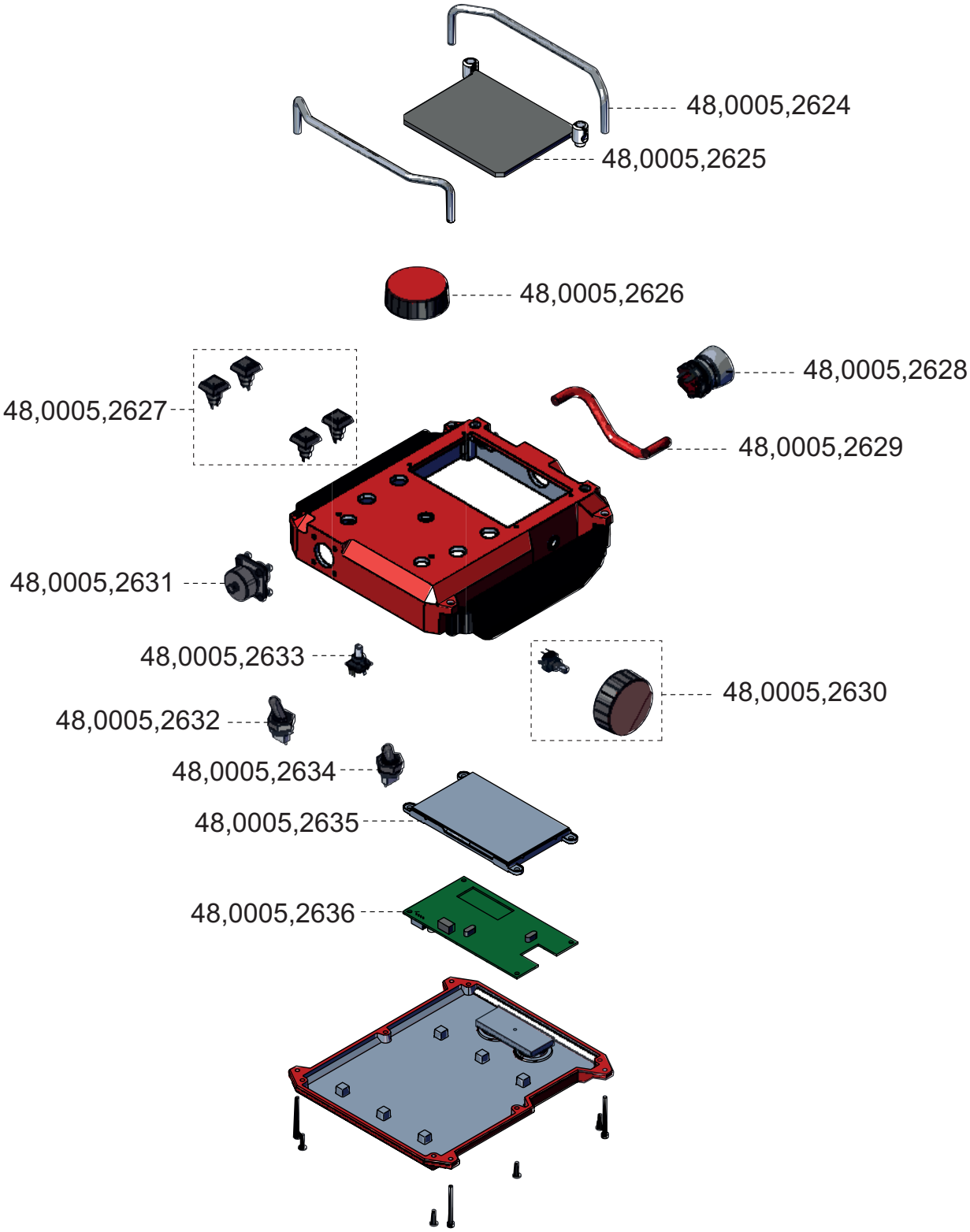
FlexTrack 45 Carriage Pro **Item no.: 8,045,639**



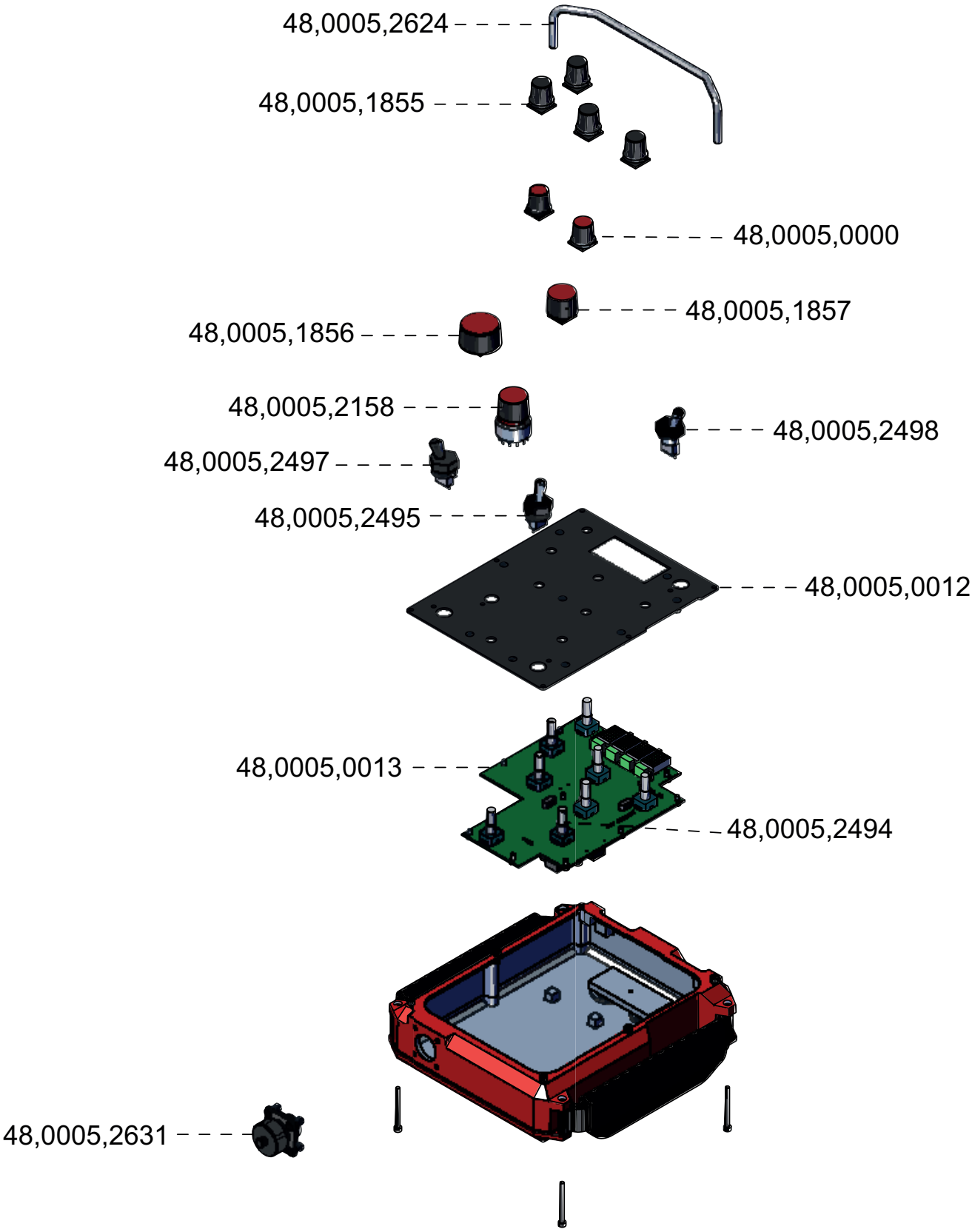
Control box interior



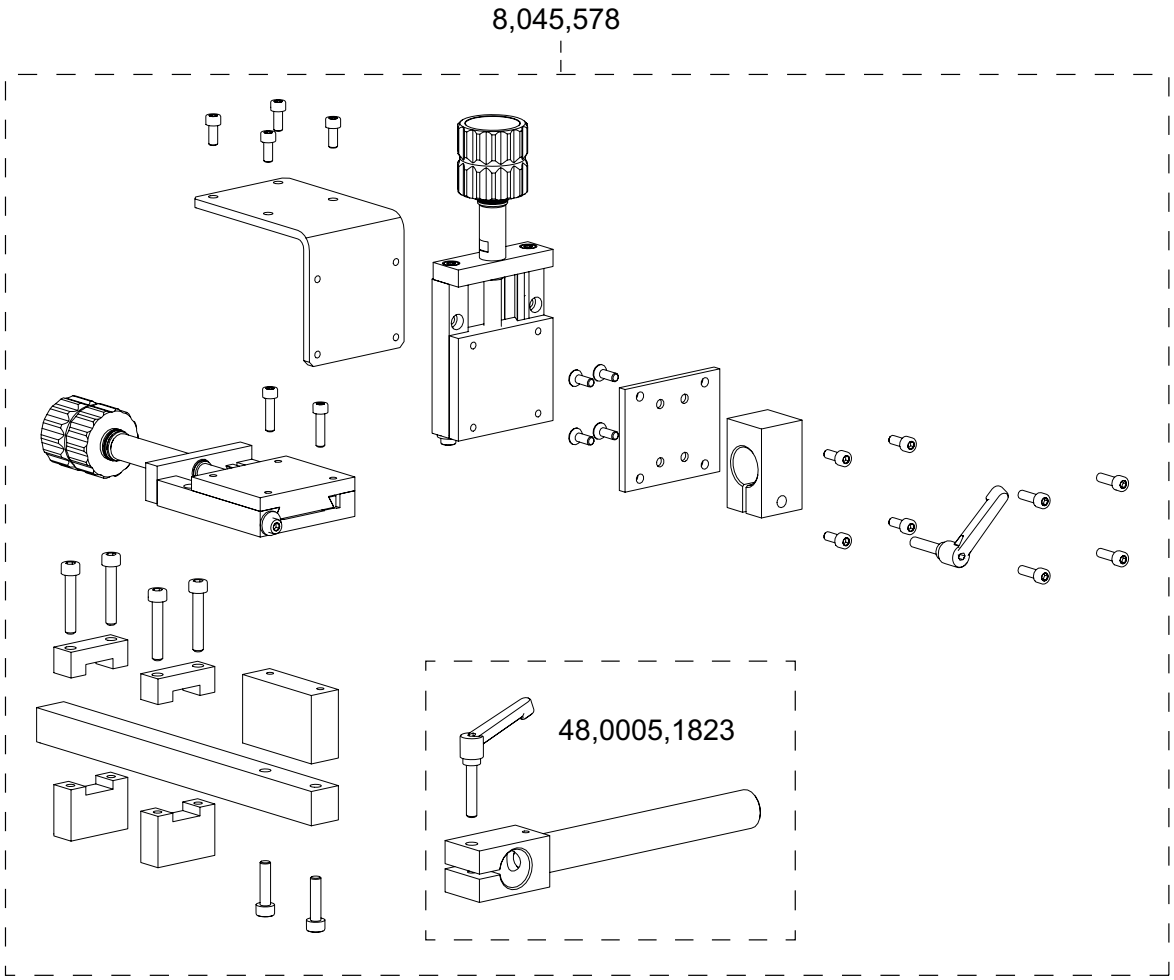
FRC-45 Pro remote control **Item no.: 8,046,043**



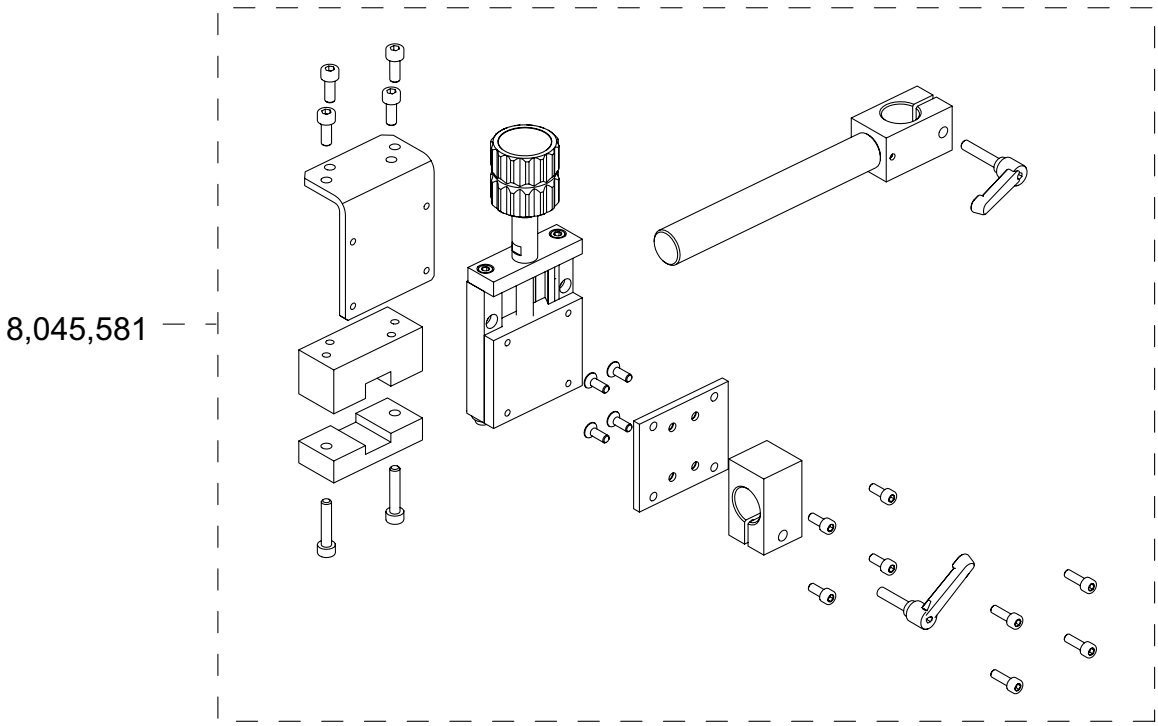
Not shown in drawing: Micro-SD-Card, Art. No: 48,0005,0132

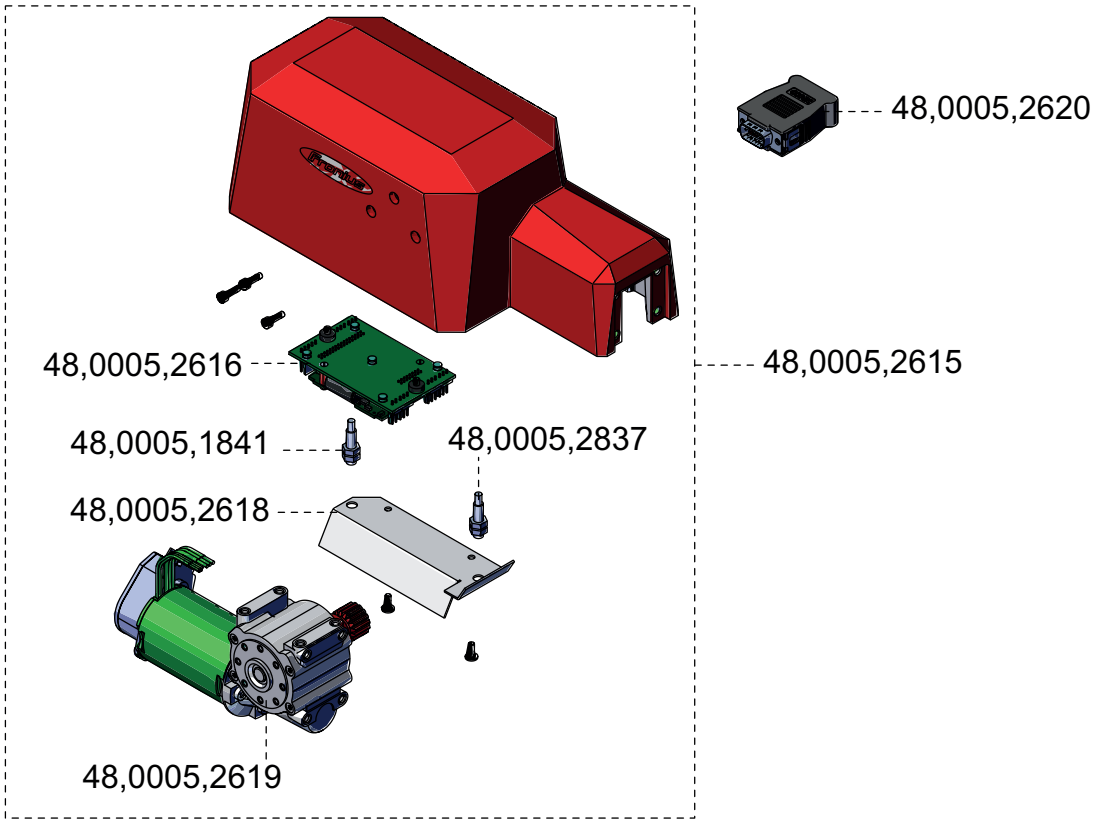

48,0005,2624
48,0005,1855
48,0005,0000
48,0005,1857
48,0005,1856
48,0005,2158
48,0005,2498
48,0005,2497
48,0005,2495
48,0005,0012
48,0005,0013
48,0005,2494
48,0005,2631

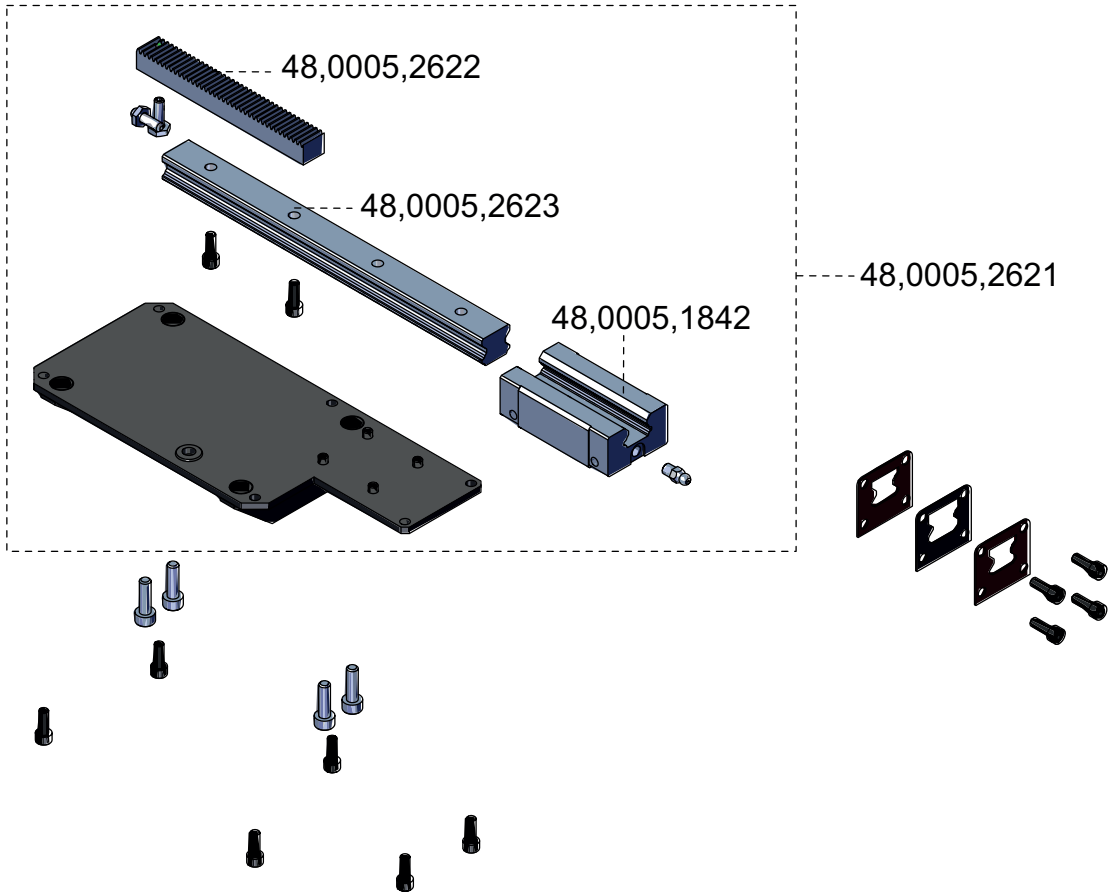
FGU 8/SD80-28 **Item no.: 8,045,641**



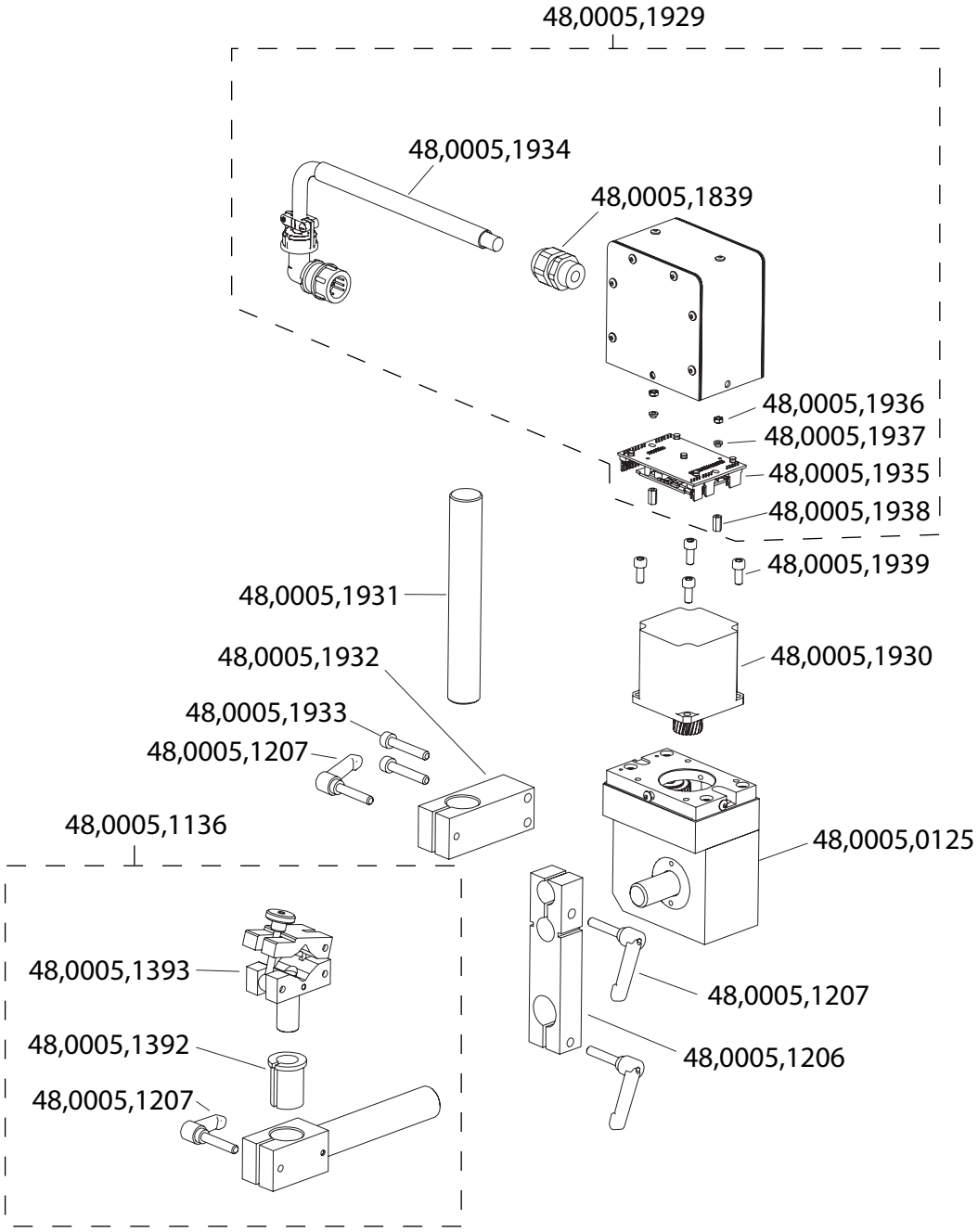
FGU 9 / SD28 **Item no.: 8,045,581**



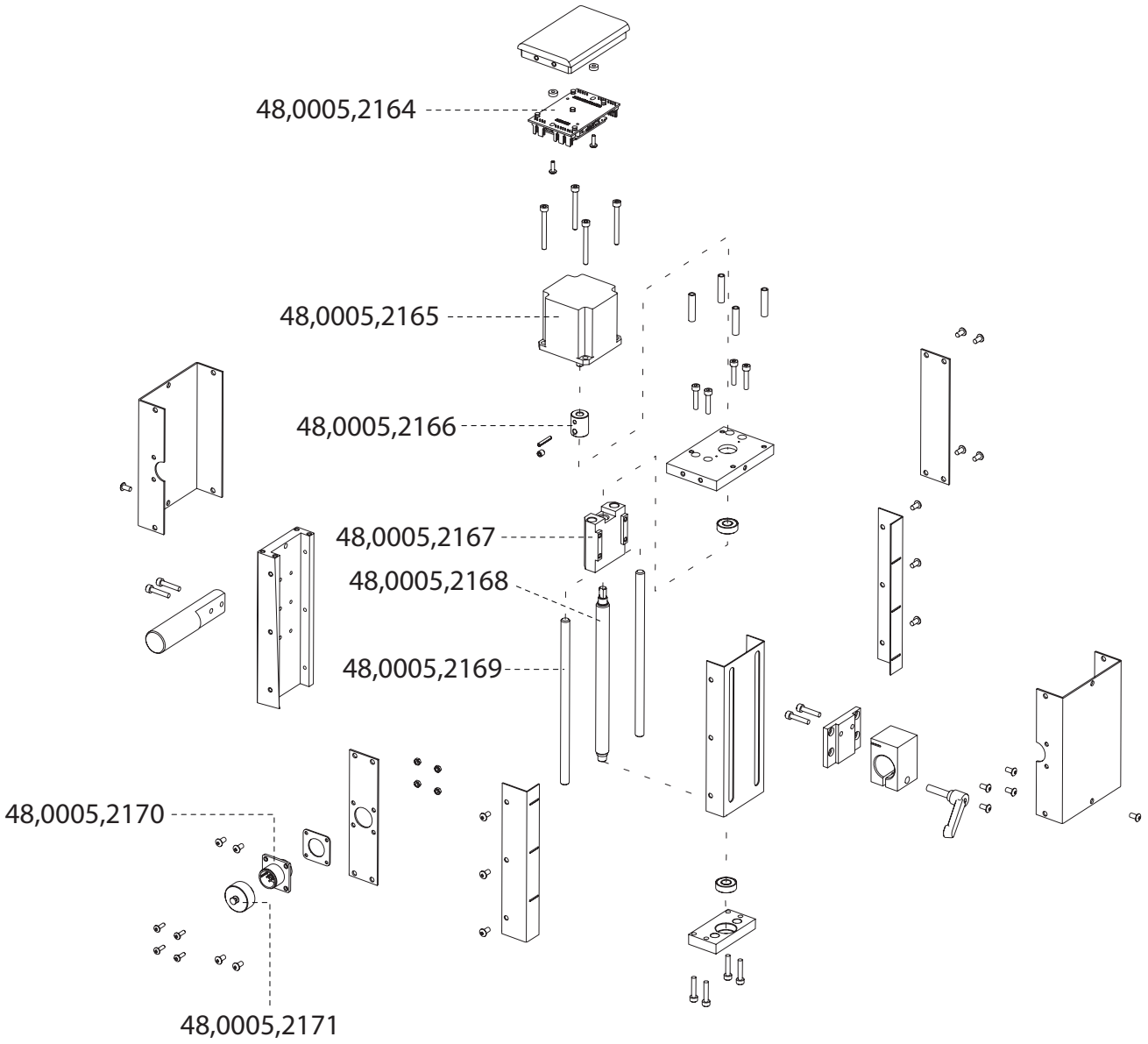

48,0005,2620
48,0005,2616
48,0005,2615
48,0005,1841
48,0005,2837
48,0005,2618
48,0005,2619


48,0005,2622
48,0005,2623
48,0005,2621
48,0005,1842

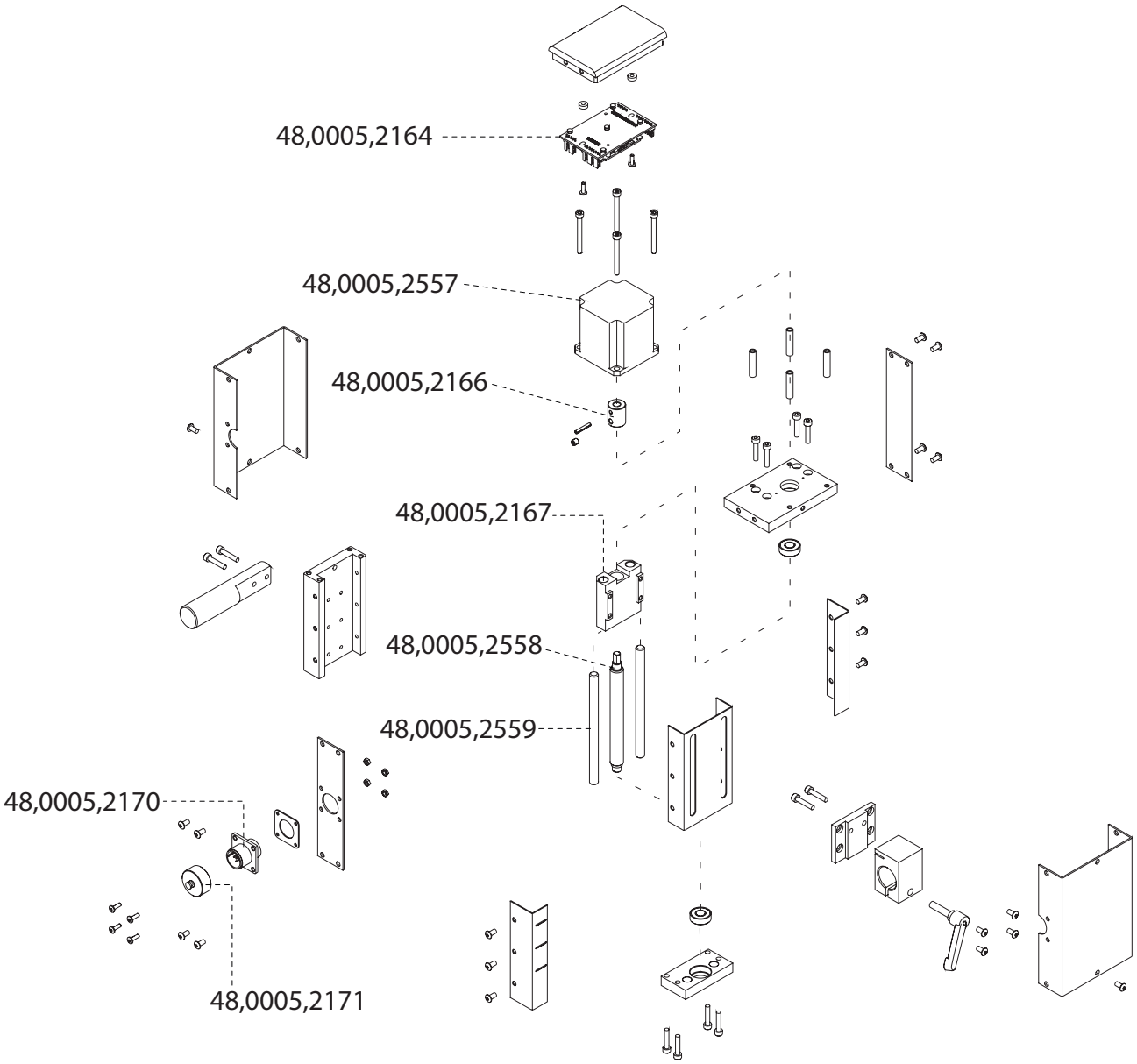
FOU 30 / ML6 / radial **Item no.: 8,045,590**



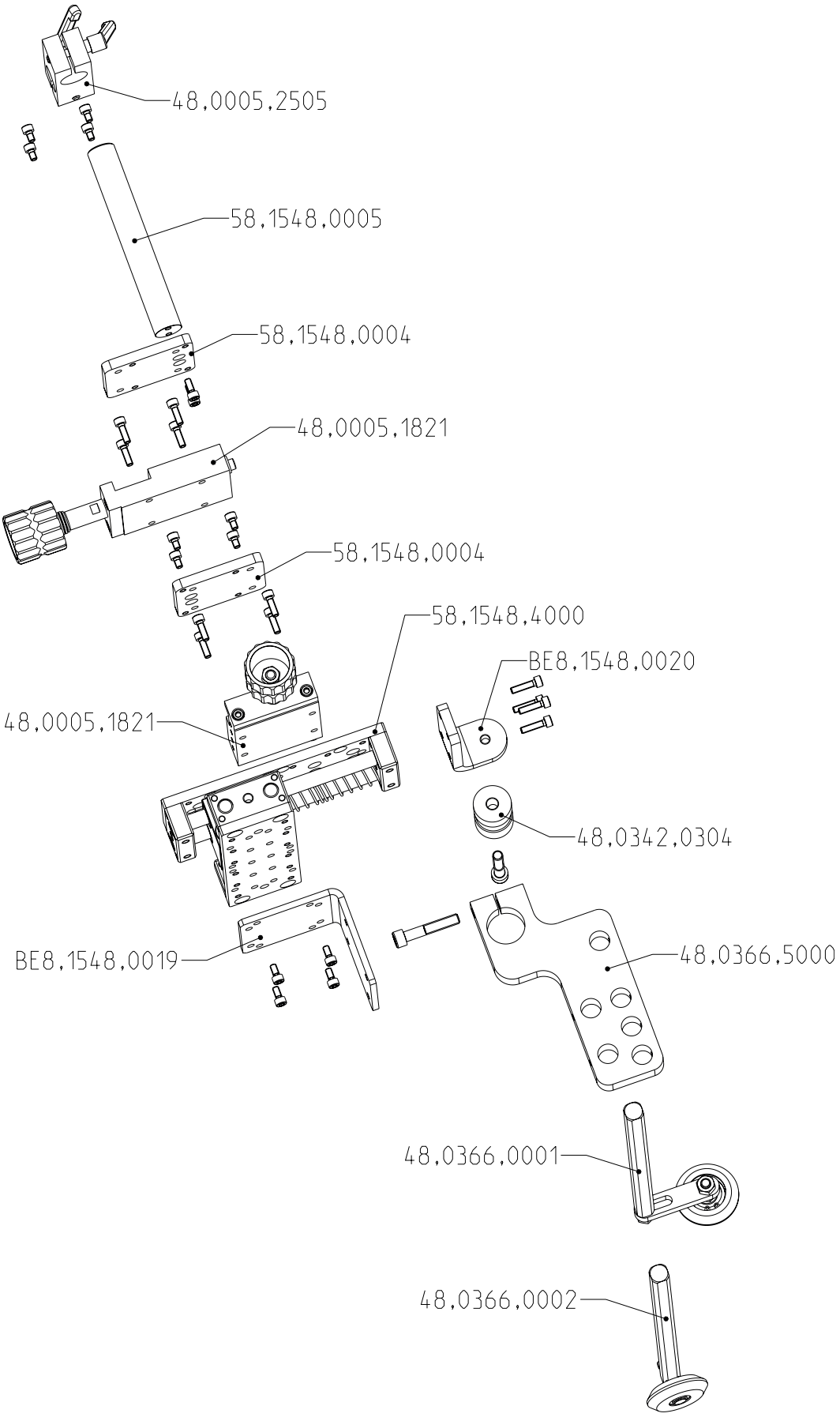
FMS 100/ML15/SE/ACC **Item no.: 8,045,599**



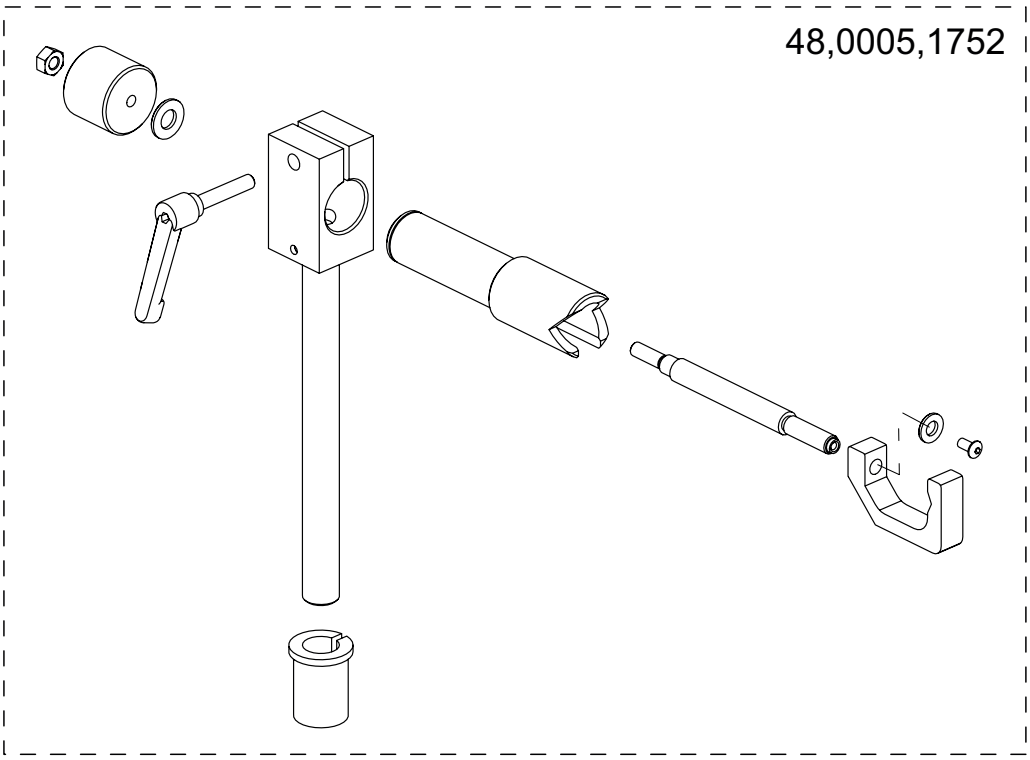
FMS 50/ML15/SE/ACC **Item no.: 8,045,618**



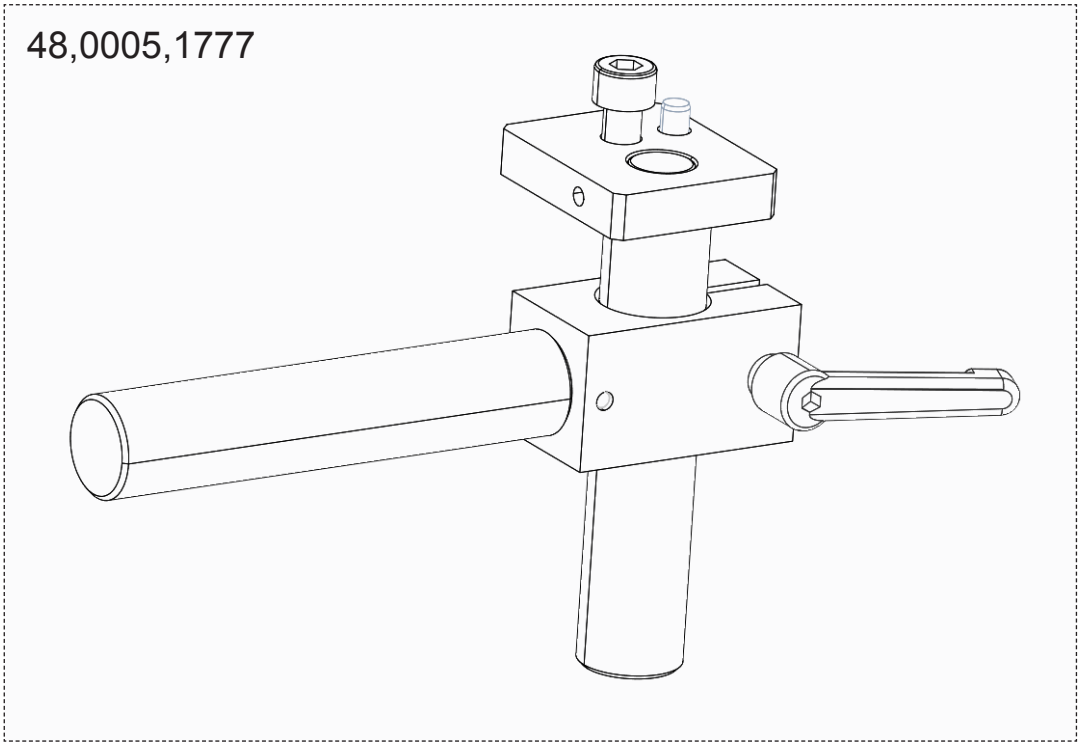
Mechanical seam tracking (no overall item number)



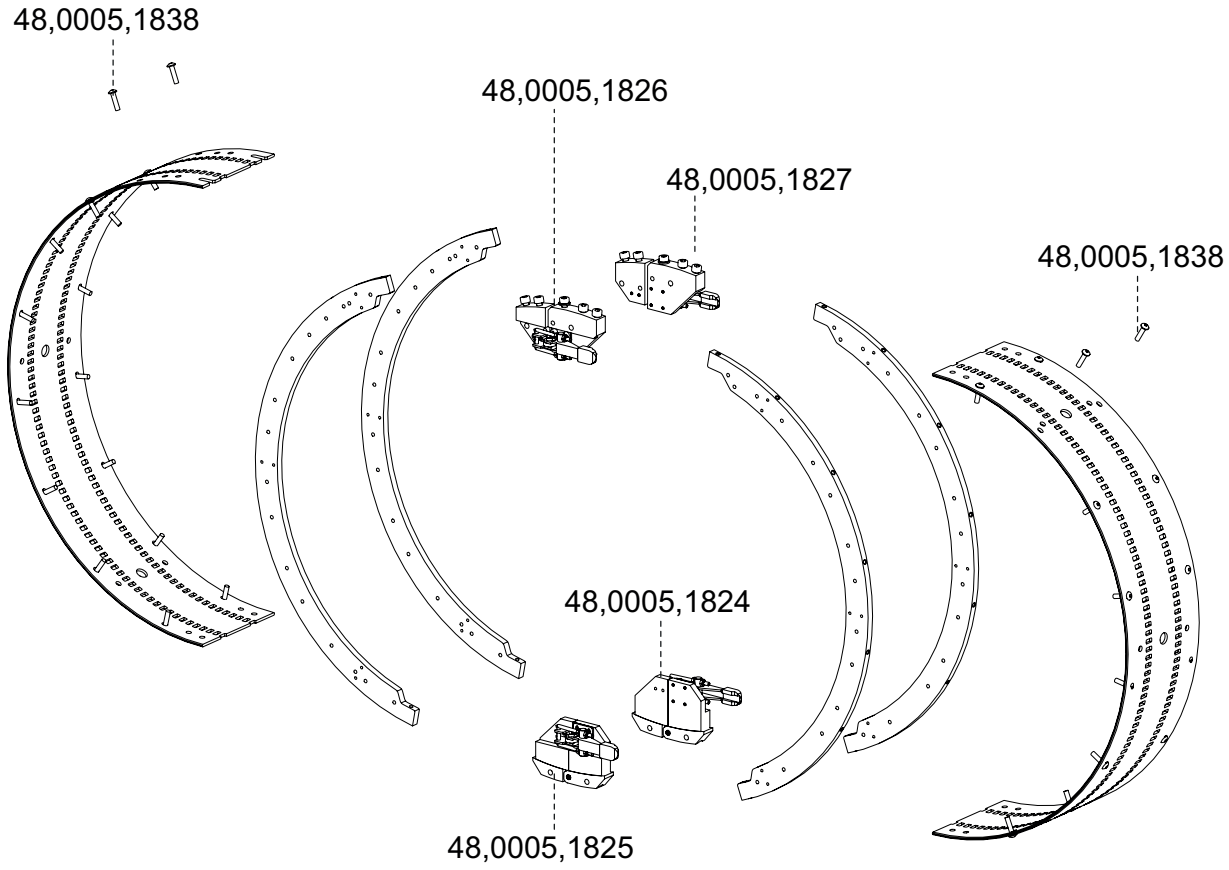
FTH 18/D16-25 **Item no.: 48,0005,1752**



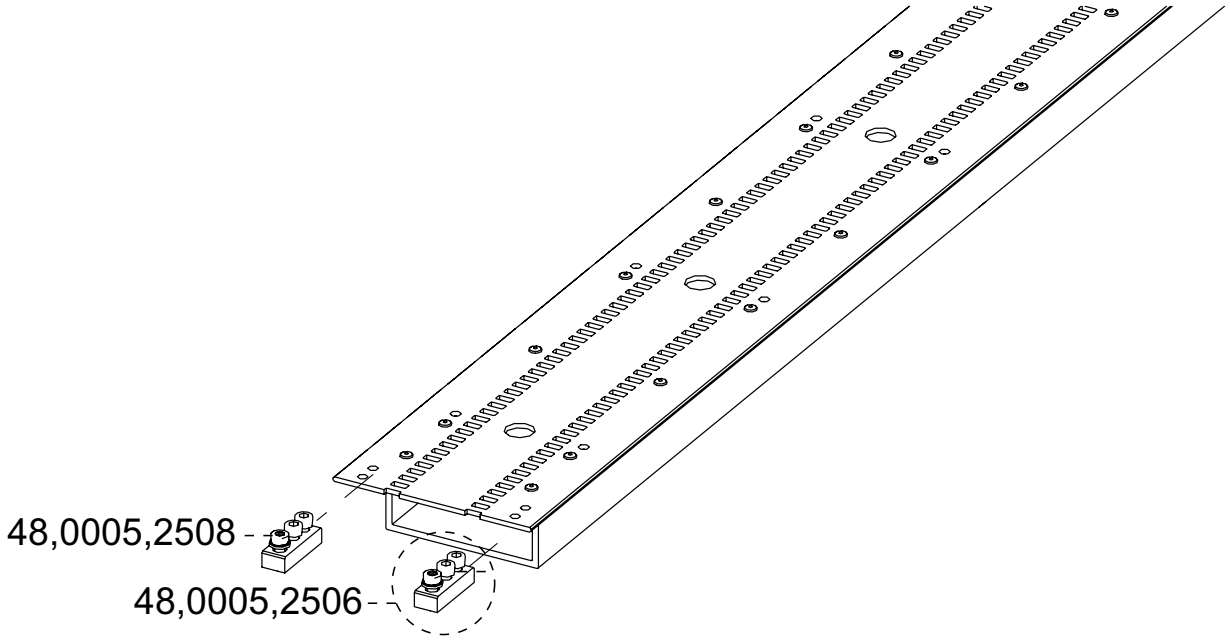
FTH 21 **Item no.: 48,0005,1777**



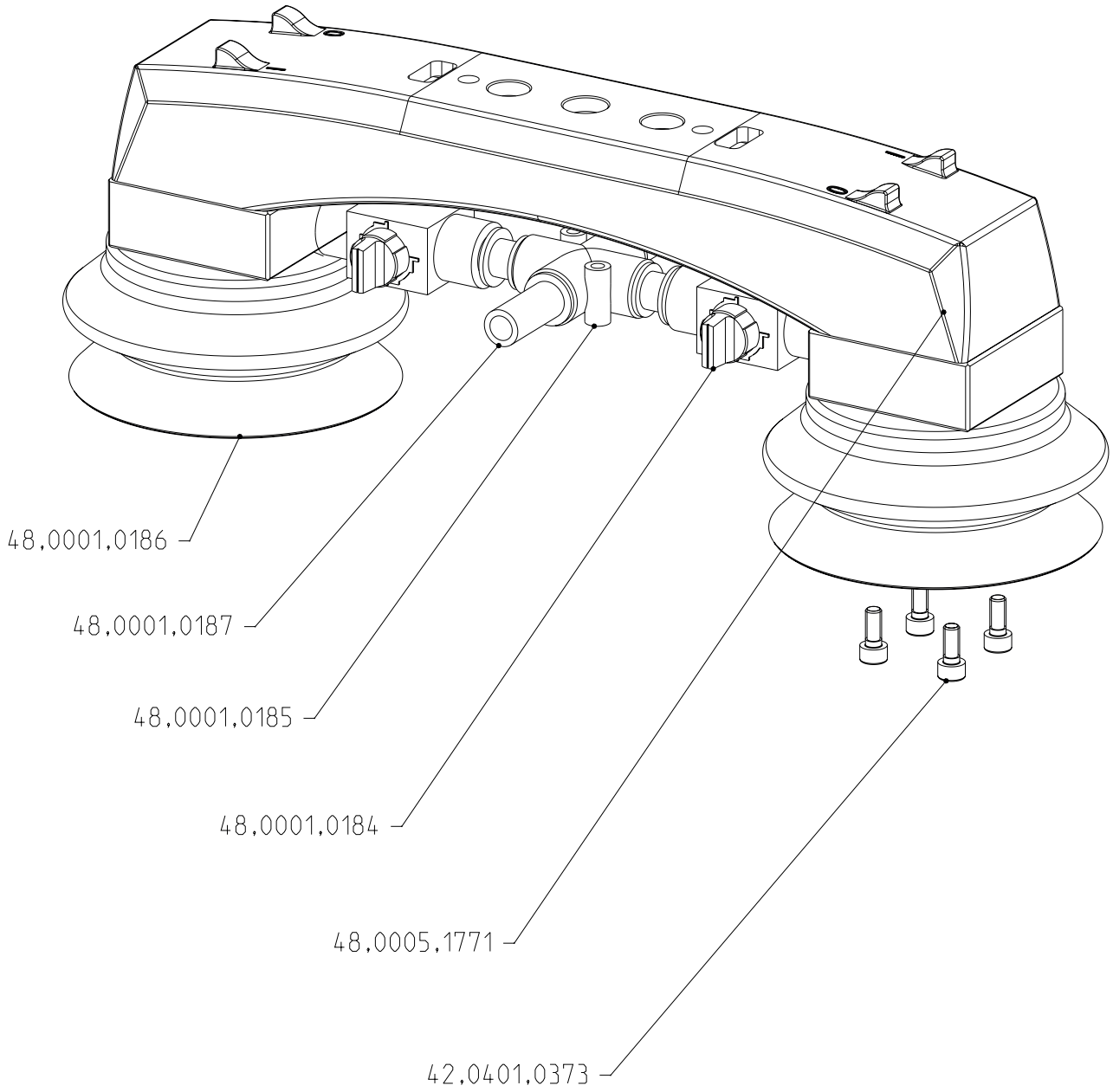
Closed ring rail



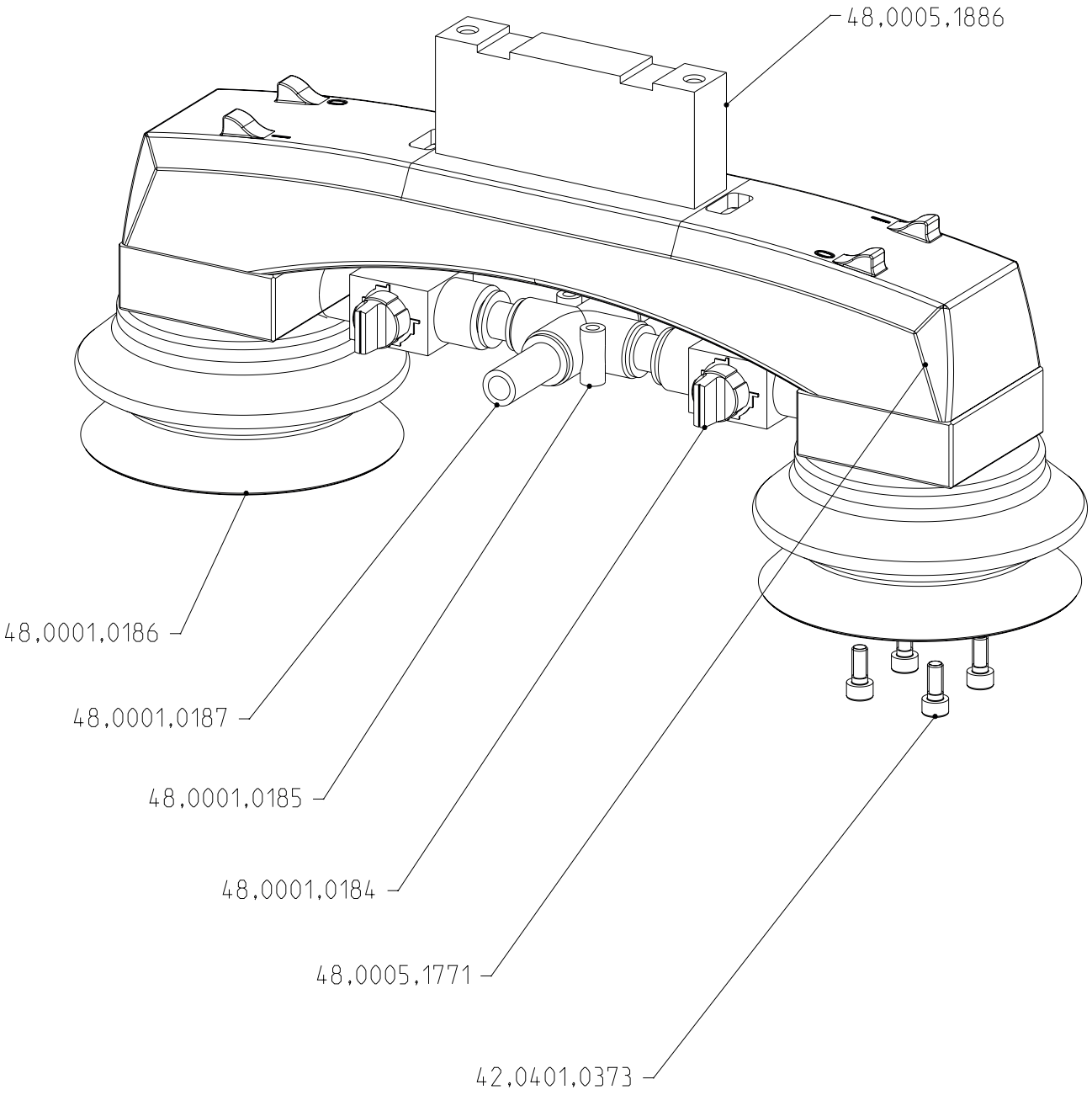
Straight guide rails (rigid and flexible)



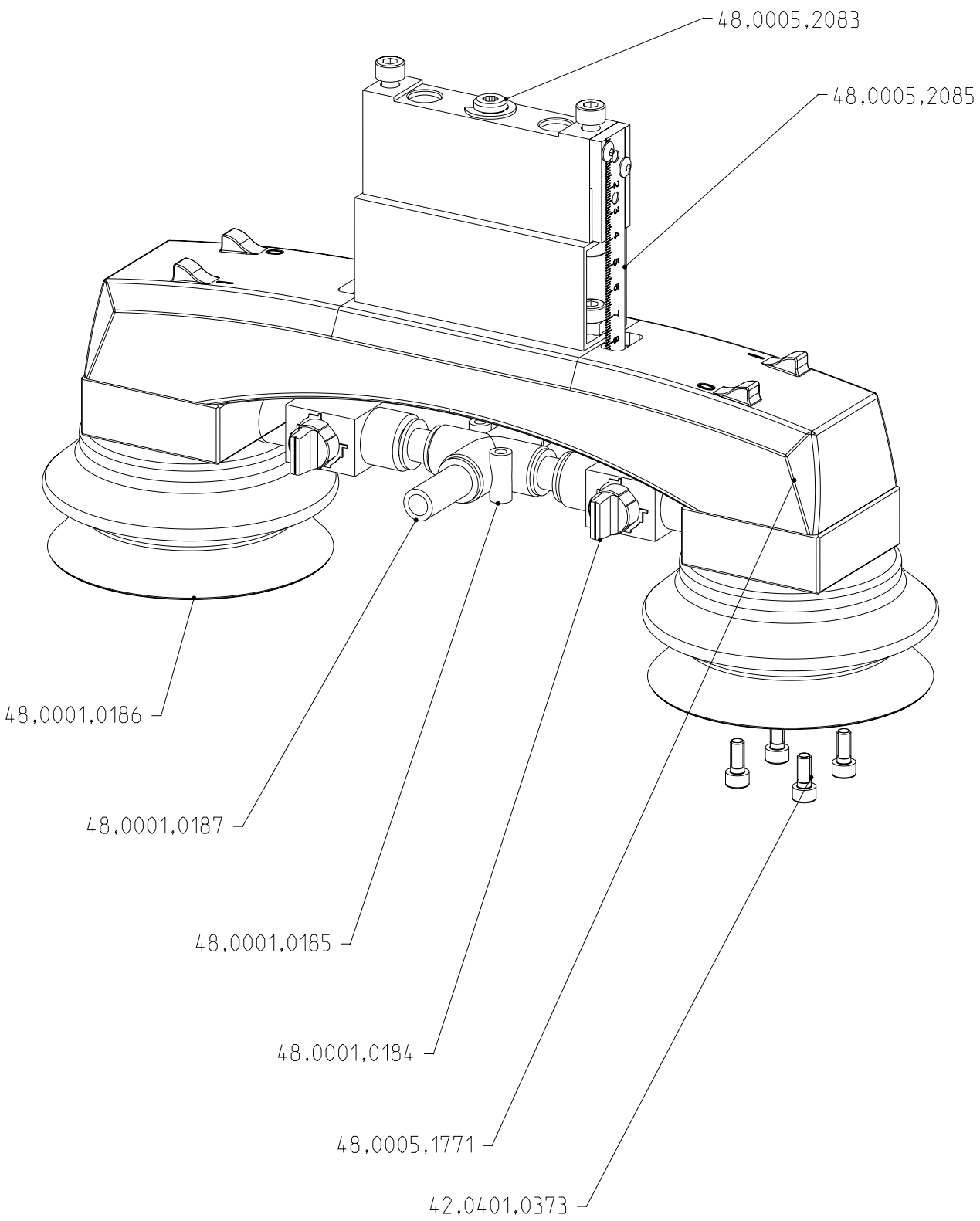
Vacuum bridge **Item no. 48,0005,1771**



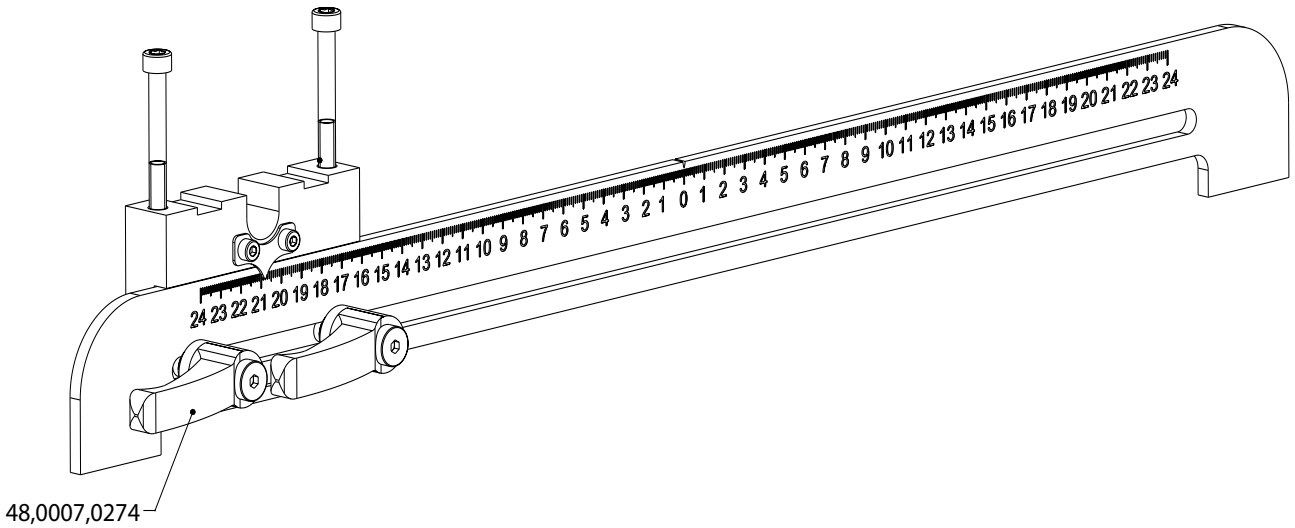
Vacuum bridge	**Item no. 48,0005,1771**
with spacer block	**Item no. 48,0005, 1886**



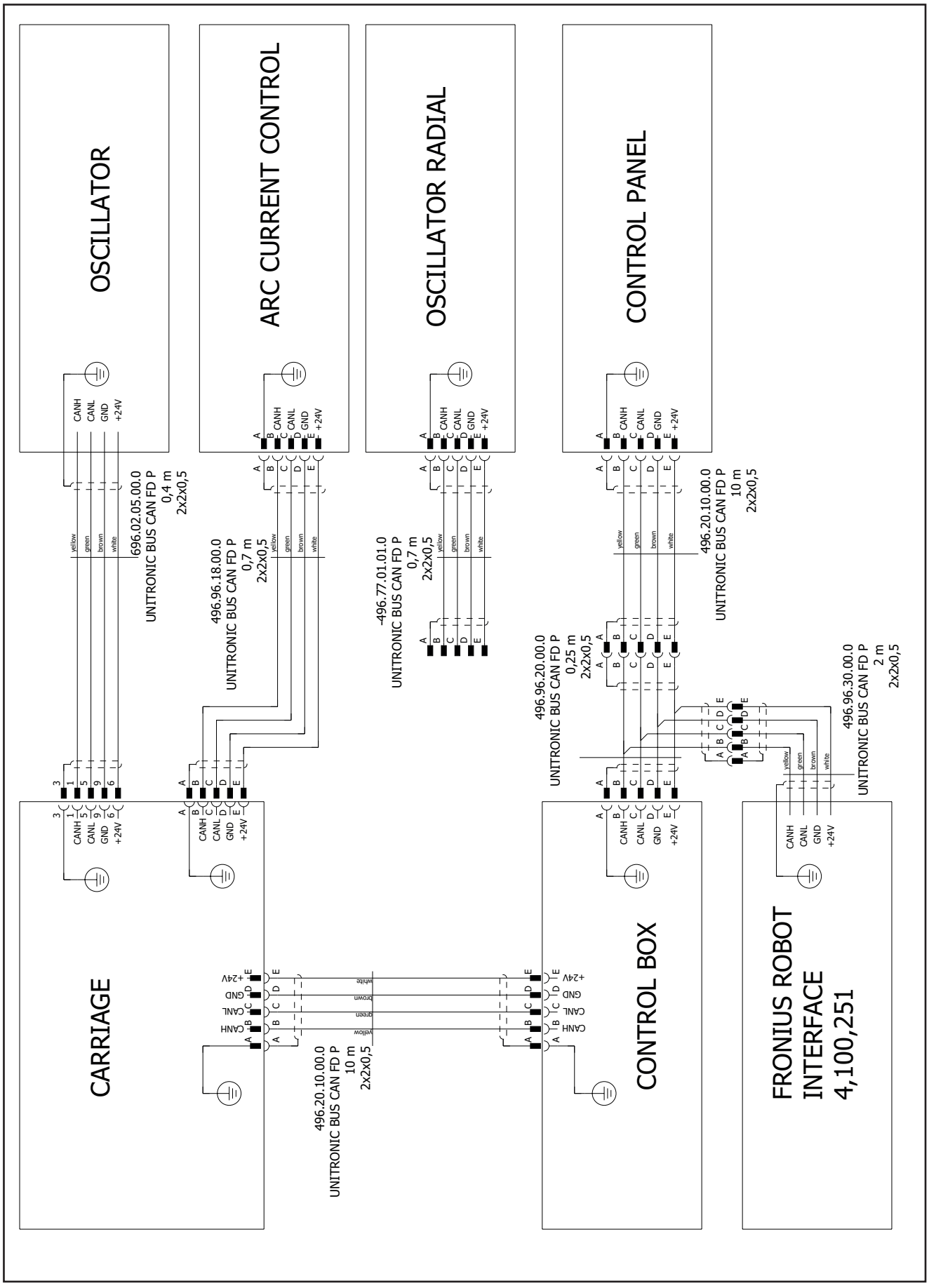
Vacuum bridge	**Item no. 48,0005,1771**
with adjustment unit	**Item no. 48,0005, 2083/48,0005,2085**

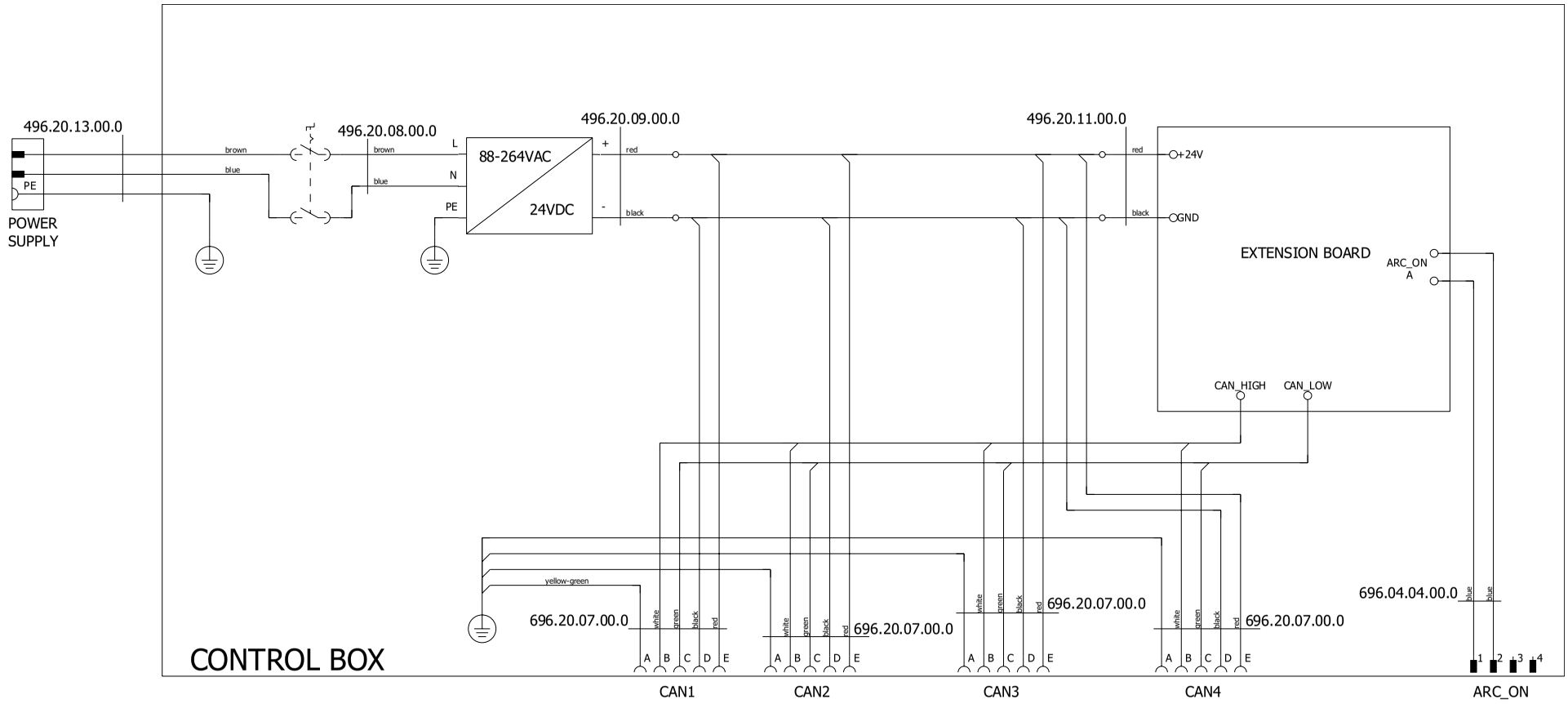


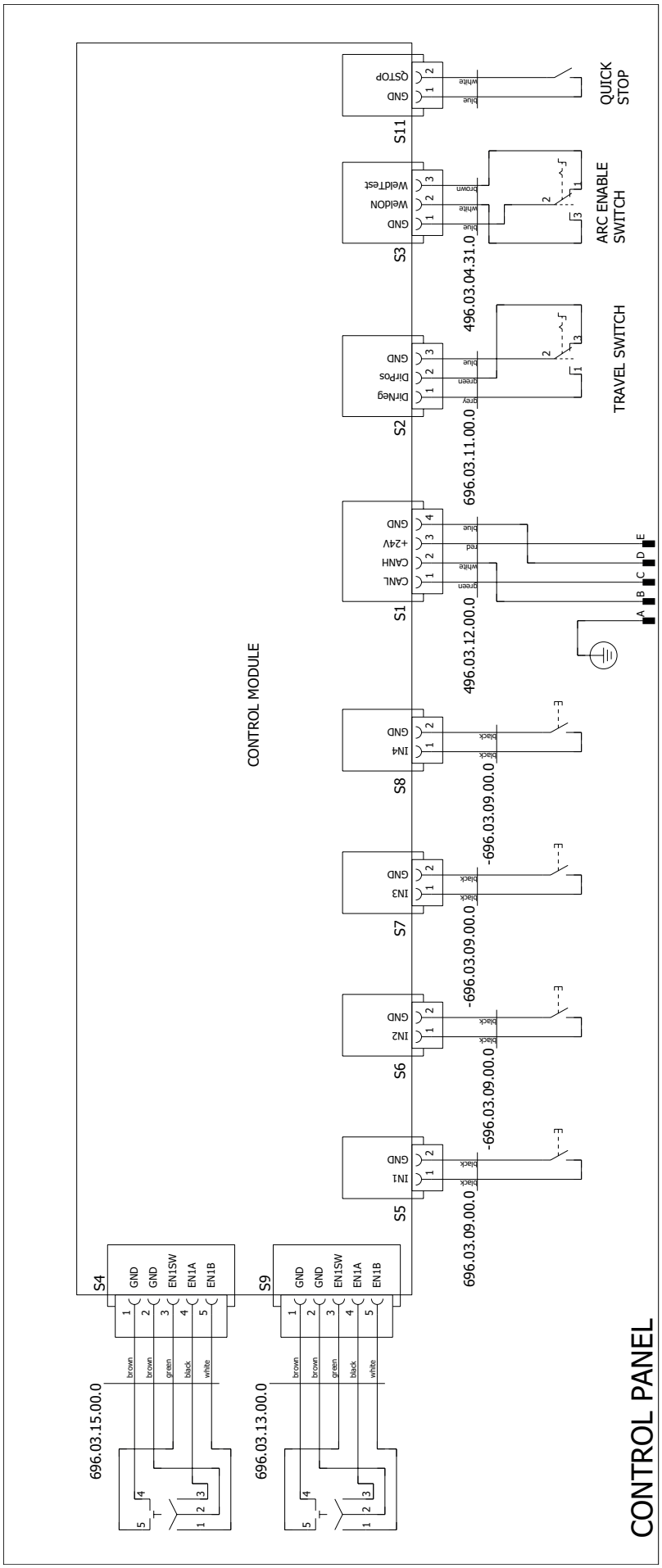
Setting gauge **Drawing number: 58-1301-1100**

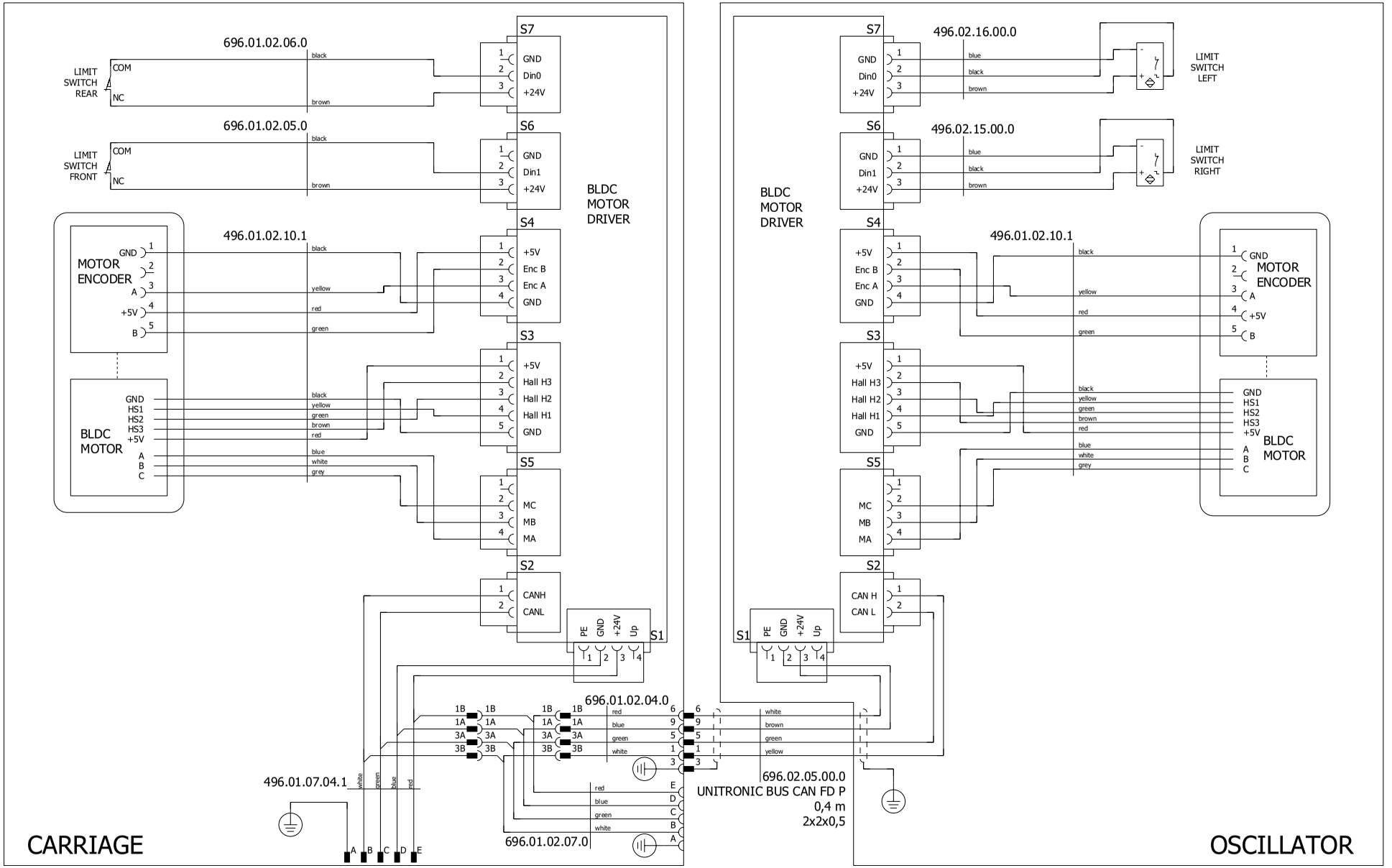


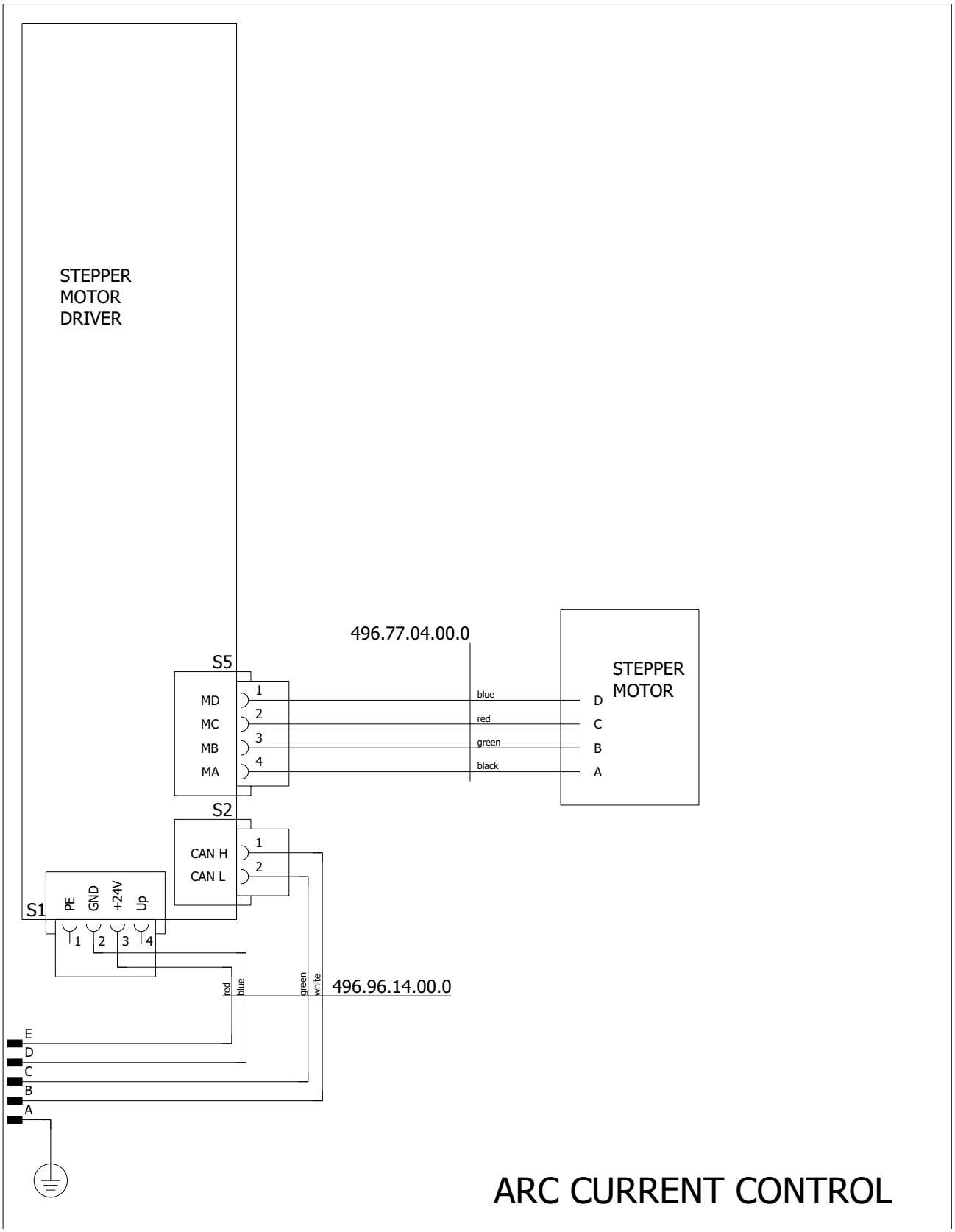
Wiring diagram

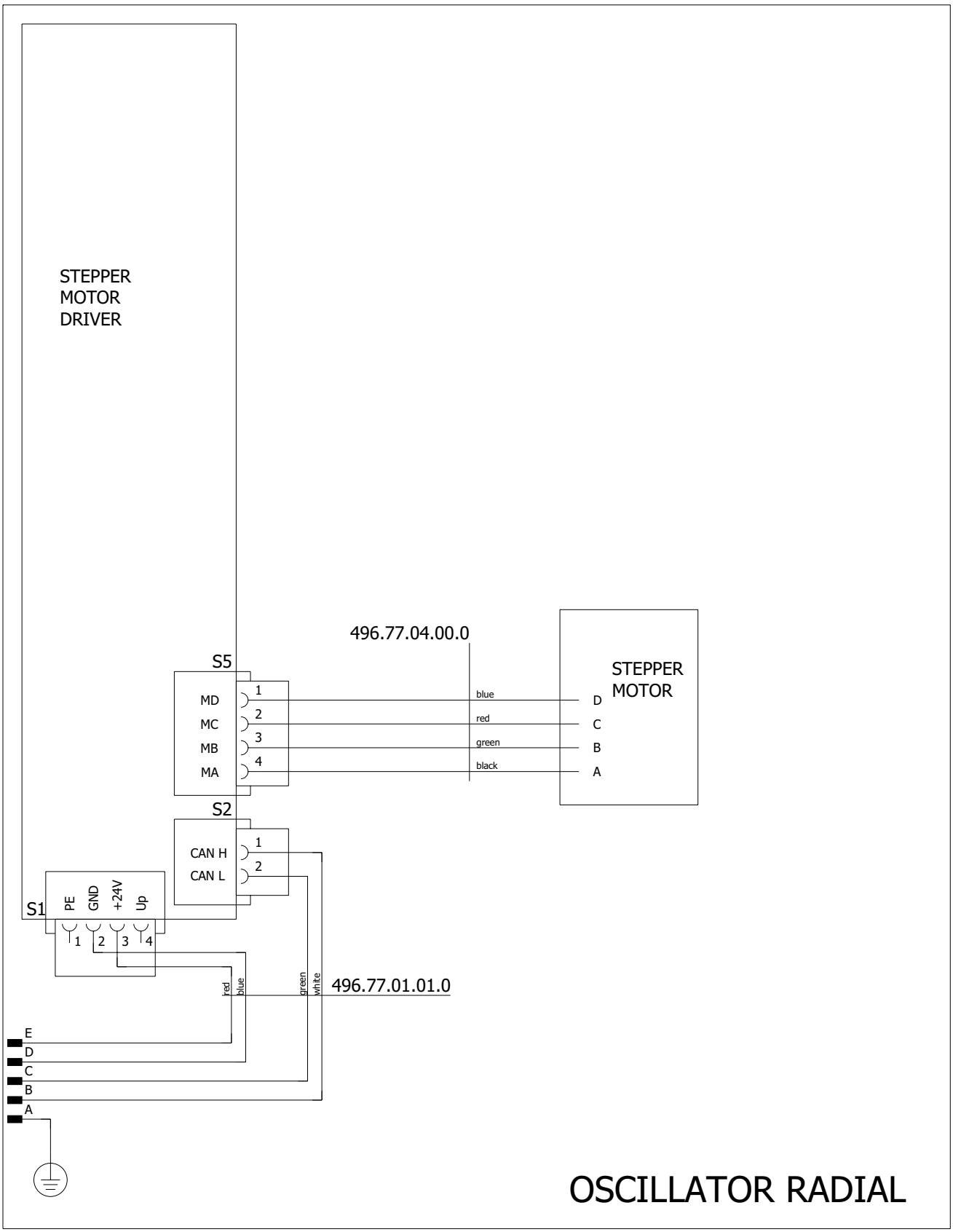



496.20.13.00.0
PE
POWER
SUPPLY
brown
blue
496.20.08.00.0
L
N
PE
88-264VAC
24VDC
496.20.09.00.0
+
-
red
black
496.20.11.00.0
+24V
GND
EXTENSION BOARD
ARC_ON
A
CAN_HIGH
CAN_LOW
yellow-green
696.20.07.00.0
white
green
black
red
A B C D E
CAN1
CAN2
CAN3
CAN4
696.04.04.00.0
blue
1 2 3 4
ARC_ON
CONTROL BOX


CONTROL PANEL
CONTROL MODULE
QUICK STOP
ARC ENABLE SWITCH
TRAVEL SWITCH
S11
QSTOP
GND
S3
WeldTest
WeldON
GND
S2
DirPos
DirNeg
GND
S1
GND
+24V
CANH
CANL
S8
IN4
GND
S7
IN3
GND
S6
IN2
GND
S5
IN1
GND
S4
S9
GND
GND
EN1SW
EN1A
EN1B
brown
brown
green
black
white
696.03.15.00.0
696.03.13.00.0
696.03.09.00.0
-696.03.09.00.0
-696.03.09.00.0
-696.03.09.00.0
496.03.12.00.0
696.03.11.00.0
496.03.04.31.0


CARRIAGE
OSCILLATOR
BLDC MOTOR DRIVER
BLDC MOTOR DRIVER
696.01.02.06.0
LIMIT SWITCH REAR
COM
NC
696.01.02.05.0
LIMIT SWITCH FRONT
496.01.02.10.1
MOTOR ENCODER
BLDC MOTOR
496.01.07.04.1
696.01.02.04.0
696.01.02.07.0
696.02.05.00.0
UNITRONIC BUS CAN FD P
0,4 m
2x2x0,5
496.02.16.00.0
LIMIT SWITCH LEFT
496.02.15.00.0
LIMIT SWITCH RIGHT
S1
S2
S3
S4
S5
S6
S7
PE
GND
+24V
Up
CANH
CANL
CAN H
CAN L
Din0
Din1
Enc A
Enc B
Hall H1
Hall H2
Hall H3
MC
MB
MA
HS1
HS2
HS3
black
brown
red
yellow
green
blue
white
grey


STEPPER
MOTOR
DRIVER
496.77.04.00.0
S5
MD
MC
MB
MA
1
2
3
4
blue
red
green
black
STEPPER
MOTOR
D
C
B
A
S2
CAN H
CAN L
1
2
S1
PE
GND
+24V
Up
1
2
3
4
red
blue
green
white
496.96.14.00.0
E
D
C
B
A
ARC CURRENT CONTROL


STEPPER
MOTOR
DRIVER
496.77.04.00.0
S5
MD
MC
MB
MA
1
2
3
4
blue
red
green
black
STEPPER
MOTOR
D
C
B
A
S2
CAN H
CAN L
1
2
S1
PE
GND
+24V
Up
1
2
3
4
red
blue
green
white
496.77.01.01.0
E
D
C
B
A
OSCILLATOR RADIAL

Declaration of conformity

EU-KONFORMITÄTSERKLÄRUNG 2018
EU-DECLARATION OF CONFORMITY 2018
DÉCLARATION UE DE CONFORMITÉ, 2018

Wels-Thalheim, 2018-01-16

Die Firma	Manufacturer	La compagnie

FRONIUS INTERNATIONAL GMBH
Froniusstraße 1, A-4643 Pettenbach

erklärt in alleiniger Verantwortung, dass folgendes Produkt:	Hereby certifies on its sole responsibility that the following product:	se déclare seule responsable du fait que le produit suivant:
FlexTrack 45 PRO Fahrwerk	FlexTrack 45 PRO Welding carriage	FlexTrack 45 PRO Chariot de soudage
auf das sich diese Erklärung bezieht, mit folgenden Richtlinien bzw. Normen übereinstimmt:	which is explicitly referred to by this Declaration meet the following directives and standard(s):	qui est l'objet de la présente déclaration correspondent aux suivantes directives et normes:
Richtlinie 2014/35/EU Elektrische Betriebsmittel Niederspannungsrichtlinie	Directive 2014/35/EU Electrical Apparatus Low Voltage Directive	Directive 2014/35/UE Outillages électriques Directive de basse tension
Richtlinie 2014/30/EU Elektromag. Verträglichkeit	Directive 2014/30/EU Electromag. compatibility	Directive 2014/30/UE Électromag. Compatibilité
Richtlinie 2011/65/EU RoHS	Directive 2011/65/EU RoHS	Directive 2011/65/UE RoHS
Richtlinie 2006/42/EG Maschinenrichtlinie	Directive 2006/42/EC Machinery Directive	Directive 2006/42/CE Directive aux machines
Europäische Normen inklusive zutreffende Änderungen EN ISO 12100:2010 EN 60204-1:2009 EN 61000-6-2:2005+AC:2005 EN 61000-6-4:2007+A1:2011	European Standards including relevant amendments EN ISO 12100:2010 EN 60204-1:2009 EN 61000-6-2:2005+AC:2005 EN 61000-6-4:2007+A1:2011	Normes européennes avec amendements correspondants EN ISO 12100:2010 EN 60204-1:2009 EN 61000-6-2:2005+AC:2005 EN 61000-6-4:2007+A1:2011
Die oben genannte Firma hält Dokumentationen als Nachweis der Erfüllung der Sicherheitsziele und die wesentlichen Schutzanforderungen zur Einsicht bereit.	Documentation evidencing conformity with the requirements of the Directives is kept available for inspection at the above Manufacturer.	En tant que preuve de la satisfaction des demandes de sécurité la documentation peut être consultée chez la compagnie susmentionnée.
Dokumentationsverantwortlicher: (technische Dokumentation)	person responsible for documents: (technical documents)	responsable documentation: (technique documentation)
Ing. Josef Feichtinger Günter Fronius Straße 1 A - 4600 Wels-Thalheim	Ing. Josef Feichtinger Günter Fronius Straße 1 A - 4600 Wels-Thalheim	Ing. Josef Feichtinger Günter Fronius Straße 1 A - 4600 Wels-Thalheim

CE **2018**

ppa. T. Herndler, MAS
Member of Board
Chief Production Officer

DE German Deutsch EN English English FR French Française

EU-KONFORMITÄTSERKLÄRUNG 2018
EU-DECLARATION OF CONFORMITY 2018
DÉCLARATION UE DE CONFORMITÉ, 2018

Wels-Thalheim, 2018-01-16

Die Firma	Manufacturer	La compagnie

FRONIUS INTERNATIONAL GMBH
Froniusstraße 1, A-4643 Pettenbach

erklärt in alleiniger Verantwortung, dass folgendes Produkt:	Hereby certifies on its sole responsibility that the following product:	se déclare seule responsable du fait que le produit suivant:
e-cabinet Steuergerät	e-cabinet Control unit	e-cabinet Appareil de commande
auf das sich diese Erklärung bezieht, mit folgenden Richtlinien bzw. Normen übereinstimmt:	which is explicitly referred to by this Declaration meet the following directives and standard(s):	qui est l'objet de la présente déclaration correspondent aux suivantes directives et normes:
Richtlinie 2014/35/EU Elektrische Betriebsmittel Niederspannungsrichtlinie	Directive 2014/35/EU Electrical Apparatus Low Voltage Directive	Directive 2014/35/UE Outillages électriques Directive de basse tension
Richtlinie 2014/30/EU Elektromag. Verträglichkeit	Directive 2014/30/EU Electromag. compatibility	Directive 2014/30/UE Électromag. Compatibilité
Richtlinie 2011/65/EU RoHS	Directive 2011/65/EU RoHS	Directive 2011/65/UE RoHS
Europäische Normen inklusive zutreffende Änderungen EN 60204-1:2009 EN 61000-6-2:2005+AC:2005 EN 61000-6-4:2007+A1:2011	European Standards including relevant amendments EN 60204-1:2009 EN 61000-6-2:2005+AC:2005 EN 61000-6-4:2007+A1:2011	Normes européennes avec amendements correspondants EN 60204-1:2009 EN 61000-6-2:2005+AC:2005 EN 61000-6-4:2007+A1:2011
Die oben genannte Firma hält Dokumentationen als Nachweis der Erfüllung der Sicherheitsziele und die wesentlichen Schutzanforderungen zur Einsicht bereit.	Documentation evidencing conformity with the requirements of the Directives is kept available for inspection at the above Manufacturer.	En tant que preuve de la satisfaction des demandes de sécurité la documentation peut être consultée chez la compagnie susmentionnée.

CE marking date: **2018**

ppa. T. Herndler, MAS
Member of Board
Chief Production Officer

DE German Deutsch EN English English FR French Française

EU-KONFORMITÄTSERKLÄRUNG 2018
EU-DECLARATION OF CONFORMITY 2018
DÉCLARATION UE DE CONFORMITÉ, 2018

Wels-Thalheim, 2018-01-16

Die Firma	Manufacturer	La compagnie

FRONIUS INTERNATIONAL GMBH
Froniusstraße 1, A-4643 Pettenbach

erklärt in alleiniger Verantwortung, dass folgendes Produkt:	Hereby certifies on its sole responsibility that the following product:	se déclare seule responsable du fait que le produit suivant:
FRC-45 Basic Fernbedienung	FRC-45 Basic Remote control	FRC-45 Basic Télécommande
auf das sich diese Erklärung bezieht, mit folgenden Richtlinien bzw. Normen übereinstimmt:	which is explicitly referred to by this Declaration meet the following directives and standard(s):	qui est l'objet de la présente déclaration correspondent aux suivantes directives et normes:
Richtlinie 2014/30/EU Elektromag. Verträglichkeit	Directive 2014/30/EU Electromag. compatibility	Directive 2014/30/UE Électromag. Compatibilité
Richtlinie 2011/65/EU RoHS	Directive 2011/65/EU RoHS	Directive 2011/65/UE RoHS
Europäische Normen inklusive zutreffende Änderungen	European Standards including relevant amendments	Normes européennes avec amendements correspondants
EN 61000-6-2:2005+AC:2005 EN 61000-6-4:2007+A1:2011	EN 61000-6-2:2005+AC:2005 EN 61000-6-4:2007+A1:2011	EN 61000-6-2:2005+AC:2005 EN 61000-6-4:2007+A1:2011
Die oben genannte Firma hält Dokumentationen als Nachweis der Erfüllung der Sicherheitsziele und die wesentlichen Schutzanforderungen zur Einsicht bereit.	Documentation evidencing conformity with the requirements of the Directives is kept available for inspection at the above Manufacturer.	En tant que preuve de la satisfaction des demandes de sécurité la documentation peut être consultée chez la compagnie susmentionnée.

CE marking date: **2018**

ppa. T. Herndler, MAS
Member of Board
Chief Production Officer

DE German Deutsch EN English English FR French Française

EU-KONFORMITÄTSERKLÄRUNG 2018
EU-DECLARATION OF CONFORMITY 2018
DÉCLARATION UE DE CONFORMITÉ, 2018

Wels-Thalheim, 2018-01-16

Die Firma	Manufacturer	La compagnie

FRONIUS INTERNATIONAL GMBH
Froniusstraße 1, A-4643 Pettenbach

erklärt in alleiniger Verantwortung, dass folgendes Produkt:	Hereby certifies on its sole responsibility that the following product:	se déclare seule responsable du fait que le produit suivant:
FRC-45 Pro Fernbedienung	FRC-45 Pro Remote control	FRC-45 Pro Télécommande
auf das sich diese Erklärung bezieht, mit folgenden Richtlinien bzw. Normen übereinstimmt:	which is explicitly referred to by this Declaration meet the following directives and standard(s):	qui est l'objet de la présente déclaration correspondent aux suivantes directives et normes:
Richtlinie 2014/30/EU Elektromag. Verträglichkeit	Directive 2014/30/EU Electromag. compatibility	Directive 2014/30/UE Électromag. Compatibilité
Richtlinie 2011/65/EU RoHS	Directive 2011/65/EU RoHS	Directive 2011/65/UE RoHS
Europäische Normen inklusive zutreffende Änderungen	European Standards including relevant amendments	Normes européennes avec amendements correspondants
EN 61000-6-2:2005+AC:2005 EN 61000-6-4:2007+A1:2011	EN 61000-6-2:2005+AC:2005 EN 61000-6-4:2007+A1:2011	EN 61000-6-2:2005+AC:2005 EN 61000-6-4:2007+A1:2011
Die oben genannte Firma hält Dokumentationen als Nachweis der Erfüllung der Sicherheitsziele und die wesentlichen Schutzanforderungen zur Einsicht bereit.	Documentation evidencing conformity with the requirements of the Directives is kept available for inspection at the above Manufacturer.	En tant que preuve de la satisfaction des demandes de sécurité la documentation peut être consultée chez la compagnie susmentionnée.

CE marking date: **2018**

ppa. T. Herndler, MAS
Member of Board
Chief Production Officer

DE German Deutsch EN English English FR French Française

EU-EINBAUERKLÄRUNG 2018
EU DECLARATION OF INCORPORATION 2018
DECLARATION D' INCORPORATION DE U.E., 2018

Wels-Thalheim, 2018-01-16

Die Firma | Manufacturer | La compagnie

FRONIUS INTERNATIONAL GMBH
Fronius International GmbH
Froniusstraße 1, A-4643 Pettenbach

Hiermit erklären wir, dass folgendes Produkt:

FMS 50/ML15/SE/ACC
Schweißzubehör

den unten angeführten, grundlegenden Anforderungen einer „unvollständigen Maschine“ im Sinne der Maschinenrichtlinie 2006/42/EG entspricht. Das Produkt ist ausschließlich zum Einbau in eine Maschine oder unvollständige Maschine vorgesehen und entspricht daher noch nicht sämtlichen Anforderungen der Maschinenrichtlinie. Die Inbetriebnahme des Produkts ist solange untersagt, bis festgestellt wurde, dass die Maschine, in die das o. g. Produkt eingebaut wird, allen grundlegenden Anforderungen der Maschinenrichtlinie 2006/42/EG entspricht. Die speziellen technischen Unterlagen gemäß Anhang VII Teil B wurden erstellt.

Anhang I: 1.1.3, 1.1.5, 1.3.1

Dokumentationsverantwortlicher:
(technische Dokumentation)

Ing. Josef Feichtinger
Günter Fronius Straße 1
A - 4600 Wels-Thalheim

We hereby declare that the following product:

FMS 50/ML15/SE/ACC
Arc welding equipment

conforms to the essential requirements listed below of "partly completed machinery" within the meaning of the Machinery Directive, 2006/42/EU. The product is intended exclusively for installation in machinery or partly completed machinery. It therefore does not yet fully conform to all the requirements of the Machinery Directive. It is not permitted to commission the product until it is has been established that the machinery in which the above product is installed conforms to all the requirements of the Machinery Directive, 2006/42/EU. The special technical documents according to Annex VII Part B have been created.

Annex I: 1.1.3, 1.1.5, 1.3.1

person responsible for documents:
(technical documents)

Ing. Josef Feichtinger
Günter Fronius Straße 1
A - 4600 Wels-Thalheim

Nous déclarons par la présente que le produit suivant:

FMS 50/ML15/SE/ACC
Accessoires de soudage

répond aux exigences essentielles indiquées ci-dessous, relatives à celles d'une « quasi-machine » au sens de la directive machines 2006/42/CE. Le produit est exclusivement prévu pour un montage dans une machine ou une quasi-machine et ne répond donc pas encore à toutes les exigences de la directive machines. La mise en service du produit est interdite jusqu'à ce qu'il soit constaté que la machine dans laquelle le produit précité a été monté, est en conformité avec toutes les exigences de la directive machines 2006/42/CE. Les documents techniques spéciaux, conformément à l'annexe VII Partie B, ont été élaborés.

Annexe I: 1.1.3, 1.1.5, 1.3.1

responsable documentation:
(technique documentation)

Ing. Josef Feichtinger
Günter Fronius Straße 1
A - 4600 Wels-Thalheim

2018

ppa. T. Herndler, MAS
Member of Board
Chief Production Officer

DE German Deutsch | EN English English | FR French Française

EU-EINBAUERKLÄRUNG 2018
EU DECLARATION OF INCORPORATION 2018
DECLARATION D' INCORPORATION DE U.E., 2018

Wels-Thalheim, 2018-01-16

Die Firma | Manufacturer | La compagnie

FRONIUS INTERNATIONAL GMBH
Fronius International GmbH
Froniusstraße 1, A-4643 Pettenbach

Hiermit erklären wir, dass folgendes Produkt:

We hereby declare that the following product:

Nous déclarons par la présente que le produit suivant:

FMS 100/ML15/SE/ACC
Schweißzubehör

FMS 100/ML15/SE/ACC
Arc welding equipment

FMS 100/ML15/SE/ACC
Accessoires de soudage

den unten angeführten, grundlegenden Anforderungen einer „unvollständigen Maschine“ im Sinne der Maschinenrichtlinie 2006/42/EG entspricht. Das Produkt ist ausschließlich zum Einbau in eine Maschine oder unvollständige Maschine vorgesehen und entspricht daher noch nicht sämtlichen Anforderungen der Maschinenrichtlinie. Die Inbetriebnahme des Produkts ist solange untersagt, bis festgestellt wurde, dass die Maschine, in die das o. g. Produkt eingebaut wird, allen grundlegenden Anforderungen der Maschinenrichtlinie 2006/42/EG entspricht. Die speziellen technischen Unterlagen gemäß Anhang VII Teil B wurden erstellt.

conforms to the essential requirements listed below of "partly completed machinery" within the meaning of the Machinery Directive, 2006/42/EU. The product is intended exclusively for installation in machinery or partly completed machinery. It therefore does not yet fully conform to all the requirements of the Machinery Directive. It is not permitted to commission the product until it is has been established that the machinery in which the above product is installed conforms to all the requirements of the Machinery Directive, 2006/42/EU. The special technical documents according to Annex VII Part B have been created.

répond aux exigences essentielles indiquées ci-dessous, relatives à celles d'une « quasi-machine » au sens de la directive machines 2006/42/CE. Le produit est exclusivement prévu pour un montage dans une machine ou une quasi-machine et ne répond donc pas encore à toutes les exigences de la directive machines. La mise en service du produit est interdite jusqu'à ce qu'il soit constaté que la machine dans laquelle le produit précité a été monté, est en conformité avec toutes les exigences de la directive machines 2006/42/CE. Les documents techniques spéciaux, conformément à l'annexe VII Partie B, ont été élaborés.

Anhang I: 1.1.3, 1.1.5, 1.3.1

Annex I: 1.1.3, 1.1.5, 1.3.1

Annexe I: 1.1.3, 1.1.5, 1.3.1

Dokumentationsverantwortlicher:
(technische Dokumentation)

person responsible for documents:
(technical documents)

responsable documentation:
(technique documentation)

Ing. Josef Feichtinger
Günter Fronius Straße 1
A - 4600 Wels-Thalheim

Ing. Josef Feichtinger
Günter Fronius Straße 1
A - 4600 Wels-Thalheim

Ing. Josef Feichtinger
Günter Fronius Straße 1
A - 4600 Wels-Thalheim

2018

ppa. T. Herndler, MAS
Member of Board
Chief Production Officer

DE German Deutsch | EN English English | FR French Française

EU-EINBAUERKLÄRUNG 2018
EU DECLARATION OF INCORPORATION 2018
DECLARATION D' INCORPORATION DE U.E., 2018

Wels-Thalheim, 2018-01-16

Die Firma	Manufacturer	La compagnie

FRONIUS INTERNATIONAL GMBH
Fronius International GmbH
Froniusstraße 1, A-4643 Pettenbach

Hiermit erklären wir, dass folgendes Produkt:	We hereby declare that the following product:	Nous déclarons par la présente que le produit suivant:
FOU 30/ML6/radial Schweißzubehör	FOU 30/ML6/radial Arc welding equipment	FOU 30/ML6/radial Accessoires de soudage
den unten angeführten, grundlegenden Anforderungen einer „unvollständigen Maschine" im Sinne der Maschinenrichtlinie 2006/42/EG entspricht. Das Produkt ist ausschließlich zum Einbau in eine Maschine oder unvollständige Maschine vorgesehen und entspricht daher noch nicht sämtlichen Anforderungen der Maschinenrichtlinie. Die Inbetriebnahme des Produkts ist solange untersagt, bis festgestellt wurde, dass die Maschine, in die das o. g. Produkt eingebaut wird, allen grundlegenden Anforderungen der Maschinenrichtlinie 2006/42/EG entspricht. Die speziellen technischen Unterlagen gemäß Anhang VII Teil B wurden erstellt.	conforms to the essential requirements listed below of "partly completed machinery" within the meaning of the Machinery Directive, 2006/42/EU. The product is intended exclusively for installation in machinery or partly completed machinery. It therefore does not yet fully conform to all the requirements of the Machinery Directive. It is not permitted to commission the product until it is has been established that the machinery in which the above product is installed conforms to all the requirements of the Machinery Directive, 2006/42/EU. The special technical documents according to Annex VII Part B have been created.	répond aux exigences essentielles indiquées ci-dessous, relatives à celles d'une « quasi-machine » au sens de la directive machines 2006/42/CE. Le produit est exclusivement prévu pour un montage dans une machine ou une quasi-machine et ne répond donc pas encore à toutes les exigences de la directive machines. La mise en service du produit est interdite jusqu'à ce qu'il soit constaté que la machine dans laquelle le produit précité a été monté, est en conformité avec toutes les exigences de la directive machines 2006/42/CE. Les documents techniques spéciaux, conformément à l'annexe VII Partie B, ont été élaborés.
Anhang I: 1.1.3, 1.1.5, 1.3.1	**Annex I: 1.1.3, 1.1.5, 1.3.1**	**Annexe I: 1.1.3, 1.1.5, 1.3.1**
Dokumentationsverantwortlicher: (technische Dokumentation)	person responsible for documents: (technical documents)	responsable documentation: (technique documentation)
Ing. Josef Feichtinger Günter Fronius Straße 1 A - 4600 Wels-Thalheim	Ing. Josef Feichtinger Günter Fronius Straße 1 A - 4600 Wels-Thalheim	Ing. Josef Feichtinger Günter Fronius Straße 1 A - 4600 Wels-Thalheim

2018

ppa. T. Herndler, MAS
Member of Board
Chief Production Officer

DE German Deutsch EN English English FR French Française

EU-EINBAUERKLÄRUNG 2018
EU DECLARATION OF INCORPORATION 2018
DECLARATION D' INCORPORATION DE U.E., 2018

Wels-Thalheim, 2018-01-16

Die Firma	Manufacturer	La compagnie

FRONIUS INTERNATIONAL GMBH
Fronius International GmbH
Froniusstraße 1, A-4643 Pettenbach

Hiermit erklären wir, dass folgendes Produkt:	We hereby declare that the following product:	Nous déclarons par la présente que le produit suivant:
FOU 30/ML10/linear Schweißzubehör	FOU 30/ML10/linear Arc welding equipment	FOU 30/ML10/linear Accessoires de soudage
den unten angeführten, grundlegenden Anforderungen einer „unvollständigen Maschine“ im Sinne der Maschinenrichtlinie 2006/42/EG entspricht. Das Produkt ist ausschließlich zum Einbau in eine Maschine oder unvollständige Maschine vorgesehen und entspricht daher noch nicht sämtlichen Anforderungen der Maschinenrichtlinie. Die Inbetriebnahme des Produkts ist solange untersagt, bis festgestellt wurde, dass die Maschine, in die das o. g. Produkt eingebaut wird, allen grundlegenden Anforderungen der Maschinenrichtlinie 2006/42/EG entspricht. Die speziellen technischen Unterlagen gemäß Anhang VII Teil B wurden erstellt.	conforms to the essential requirements listed below of "partly completed machinery" within the meaning of the Machinery Directive, 2006/42/EU. The product is intended exclusively for installation in machinery or partly completed machinery. It therefore does not yet fully conform to all the requirements of the Machinery Directive. It is not permitted to commission the product until it is has been established that the machinery in which the above product is installed conforms to all the requirements of the Machinery Directive, 2006/42/EU. The special technical documents according to Annex VII Part B have been created.	répond aux exigences essentielles indiquées ci-dessous, relatives à celles d'une « quasi-machine » au sens de la directive machines 2006/42/CE. Le produit est exclusivement prévu pour un montage dans une machine ou une quasi-machine et ne répond donc pas encore à toutes les exigences de la directive machines. La mise en service du produit est interdite jusqu'à ce qu'il soit constaté que la machine dans laquelle le produit précité a été monté, est en conformité avec toutes les exigences de la directive machines 2006/42/CE. Les documents techniques spéciaux, conformément à l'annexe VII Partie B, ont été élaborés.
Anhang I: 1.1.3, 1.1.5, 1.3.1	**Annex I: 1.1.3, 1.1.5, 1.3.1**	**Annexe I: 1.1.3, 1.1.5, 1.3.1**
Dokumentationsverantwortlicher: (technische Dokumentation)	person responsible for documents: (technical documents)	responsable documentation: (technique documentation)
Ing. Josef Feichtinger Günter Fronius Straße 1 A - 4600 Wels-Thalheim	Ing. Josef Feichtinger Günter Fronius Straße 1 A - 4600 Wels-Thalheim	Ing. Josef Feichtinger Günter Fronius Straße 1 A - 4600 Wels-Thalheim

2018

ppa. T. Herndler, MAS
Member of Board
Chief Production Officer

DE German Deutsch EN English English FR French Française

FRONIUS INTERNATIONAL GMBH
TechSupport Automation
Froniusplatz 1, A-4600 Wels, Austria

E-Mail: support.automation@fronius.com
www.fronius.com

www.fronius.com/addresses
Under http://www.fronius.com/addresses you will find all addresses
of our Sales & service partners and Locations.