System 3R – Tooling

Delphin Short and Frames

for GFMS CUT wire EDM
Becoming better every day – since 1802

GF Machining Solutions
When all you need is everything, it’s good to know that there is one company that you can count on to deliver complete solutions and services. From unmatched Electrical Discharge Machining (EDM), Laser texturing, Laser micromachining, Additive Manufacturing and first-class Milling and Spindles to Tooling and Automation, all of our solutions are backed by unrivaled Customer Services and expert GF Machining Solutions training. Our AgieCharmilles, Microlution, Mikron Mill, Liechti, Step-Tec and System 3R technologies help you raise your game – and our digital business solutions for intelligent manufacturing, offering embedded expertise and optimized production processes across all industries, increase your competitive edge.

We are System 3R.
We are GF Machining Solutions.
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Why Delphin?

- Highest repeatability.
- Highest process reliability.

Quality

- The Delphin clamping system is modular and adapts to your machine
- Standardized interface for all machines.

Flexibility

Productivity

- Fastest possible pallet, device and workpiece change
- Less set-up time
- Unmanned work with Delphin automation.
DelphinShort chuck

Clamping mechanism with mechanical self locking for maximum work safety.

Pneumatic turbo locking function for maximum clamping force up to 10 kN.

Spring centring for pinpoint accuracy.

Z-references with cleaning & pallet detection function.

Raised collar reduces pollution of the clamping mechanism.

Pneumatic chuck releasing at 5 bar.

Key Facts
- Very compact design: outer diameter 86 mm, low height
- Stainless steel - mainly to be used in WEDM or in EDM, turning, grinding and milling with limited space
- High clamping force (up to 10 kN with turbo locking)
- Pneumatic opening at 5 bar
- A special designed DelphinShort drawbar is needed. The DelphinShort drawbars are not compatible with the standard Delphin drawbars.
DelphinShort chuck

Cleaning of Z-support
Perfectly balanced Z-support surface for the best possible cleanliness against dirt and for detection.

Dirt insensitive
Floating ball cage allows a larger angular deviation between pallet and chuck during loading and unloading. In addition the design is dirt insensitive.

Centring
Conical spring centring for absolutely zero play between drawbar and chuck. It results the highest repeatability, excellent rigidity and less vibration.
**DelphinShort chuck**

**Required air pressure**
Many clamping systems need compressed air with minimum 6 bar. The DelphinShort chuck requires only 5 bar air pressure to open the chuck and release the drawbar. This saves money and increases the process security.

**Holding force**
The holding force indicates the maximum permissible pull out force. This force determines the safety until a pallet is pulled out of the chuck. DelphinShort chucks have a minimum holding force of 20 kN.

**Drain hole**
When unloading a pallet, it can happen that dirt and water pass into the clamping system. The DelphinShort system has a drain hole. Therefore, dirt and water flush out and the chuck keeps the functionality.

**Clamping force / pull in force**
The “clamping force” or “pull in force” indicates how much the drawbar is pulled into the system. Together with other features like the centring, it is responsible for the stability and rigidity of a system.
DelphinShort – for automation and manual applications

Technical data
- Clamping force with Turbo 6 bar: 10 kN
- Clamping force without Turbo: 5 kN
- Holding forces:
  Drawbar screw M8 A4-80: 20 kN
  Drawbar screw M8 12.9: 35 kN
- Air pressure open: 5–10 bar
- Repeatability: within 0.003 mm
- Material: hardened stainless steel.

Suitable for:
- Milling
- Wire cutting
- Laser
- Die sinking
- Automation

Built-in chuck, DelphinShort, C225000
For simple installation in the machine table or in a baseplate.

Built-up chuck, DelphinShort, WEDM flange, C225300
For simple installation on WEDM machine tableframe.

Built-up chuck, DelphinShort, C225310
For direct installation on a machine table. Mounting holes to be drilled at installation.
**Delphin Drawbars**

*Function of the drawbars*

Drawbars are mounted directly into a workpiece, pallet or fixture. There are three different types of drawbars. One defines the zero point and centers thus in 2 axes. The second drawbar is centring in one axis. All other drawbars have no centring, only clamping function.

For centring in 2 axes = zero point.

For centring in 1 axis = angle definition.

No centring = only clamping.
**DelphinShort Drawbars**

**Drawbar, DelphinShort, centring in 2 axes, C226000**
Fixed in WEDM frame or pallet
- Material: stainless steel, hardened and ground
- Dimensions, screwed in: Ø26 x 27.5 mm.

**Drawbar, DelphinShort, centring in 1 axis, C226100**
Fixed in WEDM frame or pallet
- Material: stainless steel, hardened and ground
- Dimensions, screwed in: Ø26 x 27.5 mm.

**Drawbar, DelphinShort without centring, C226200**
Fixed in WEDM frame or pallet
- Material: stainless steel, hardened and ground
- Dimensions, screwed in: Ø26 x 27.5 mm.

**Function of the Delphin drawbars**
- centring on 2 axes
- centring on 1 axis
- without centring

fixed in pallet
DelphinShort Accessories

DelphinShort Reference mandrel, C226310
Alignment aid for chuck installation.
- Material: steel stainless, hardened and ground
- Drawbar C226000 included
- Diameter D = 83 mm.

DelphinShort protective drawbar, C226300
Chip protection for DelphinShort chucks, seals centre bore, Z-support of chuck remains usable.
- Material: plastic
- Dimensions: Ø26x21 mm
- M8 for dismounting.

DelphinShort protective pallet, C226320
Chip and air pressure (turbo locking) protection for DelphinShort chuck.
- Fits also for chucks with sealing ring
- Includes drawbar C226000
- Diameter D = 104 mm
- Not to be used for DelphinShort Twin chucks.

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Pneumatic control unit, DelphinShort, C254960
Control unit for individual DelphinShort chucks and WEDM frames with manual operation.
- Including 10 m tube Ø6 mm and 3 fittings.

Spare parts, DelphinShort, S225005
For DelphinShort chucks. Includes O-rings, compressions springs, balls, screws and assembly tool.

DelphinShort protective pallet, C226320
Chip and air pressure (turbo locking) protection for DelphinShort chuck.
- Fits also for chucks with sealing ring
- Includes drawbar C226000
- Diameter D = 104 mm
- Not to be used for DelphinShort Twin chucks.
DelphinShort Twin is an application of the smallest Delphin chuck for use in wire EDM. It is the clamping system that we use as a duo for our large WEDM frames on various WEDM machines.

In addition to the large WEDM frames, our various adapters for palletising individual parts can also be used with all holders and vices from the System 3R WEDM system.

Furthermore, the adapter range also offers a variant for mounting customised clamping devices as well as a small clamping frame with a clamping area of 200x220mm.

All these adapters can be used with the WEDM Frames machine equipment as well as on individual installed DelphinShort Twin chucks in the WEDM machines.

**Key Facts**

- Very compact and low profile design
- Stainless steel - ideal for use in WEDM processes
- High clamping force, with turbo up to 20 kN
- Use of all holders and vices from the System 3R WEDM system
- High stability and functional reliability even with loads up to 25kg
- Ready for automation, but also suitable for manual operation.
**DelphinShort Twin chucks for WEDM**

**Technical data**
- Clamping force with 6 bar turbo pressure: up to 20kN
  Turbo: 6 ± 1 bar
- Holding force:
  Clamping spigot screw M8 A4-80 : 40 kN
  Clamping spigot screw M8 12.9 : 70 kN
- Air pressure (open): 5-10 bar
- Centre distance chuck CC=100mm
- Repeat accuracy: 0.003 mm
- Material: stainless steel
- Weight: 3.9 kg.

The DelphinShort Twin chuck GFMS CUT P/X is used for direct installation on the machine tableframe for manual or automated applications. Thanks to hardened stainless steel, the clamping unit is designed to be used mainly in WEDM. The fixation holepattern fits on all GFMS WEDM machines of the CUT P/X series. Two separate supply lines are required. One for Z-cleaning, turbo and one for releasing or opening the clamping unit.

**Chuck for CUT P Serie, DelphinShort Twin, C952010**

**Chuck for CUT X Serie, DelphinShort Twin, C952210**

**Pneumatic connection material for 1 or 2 Twin chucks, C952130**
To control 1 or 2 Twin chucks to automation control or manual control.
- Connection bloc
- Fittings
- Tubes.

**Pneumatic control unit, DelphinShort, C254960**
Control unit for individual DelphinShort chucks and WEDM frames with manual operation.
- Including 10 m tube Ø6 mm and 3 fittings.
DelphinShort Twin adapters

Levelling adapter, DelphinShort, with mounting head WEDM, C952900
This DelphinShort Twin levelling adapter for DelphinShort Twin chuck (cc 100mm) has the identical fixation interface as any Macro fixation/levelling head and allows to mount all holders and vices from the WEDM System.

- Recommended max load: 20 kg
- Adjustable in three axes
- Prepared for automatic changing
- Prepared for Gripper 26937-00, Gripper pin set S952905 (not included)
- Example of suitable chucks: C952010, C952210
- Weight: 4.6 kg.

Fix adapter, DelphinShort, with mounting head WEDM, C952910
This DelphinShort Twin fixed adapter for DelphinShort Twin chuck (cc 100mm) has the identical fixation interface as any Macro fixation/levelling head and allows to mount all holders and vices from the WEDM System.

- Recommended max load: 20 kg
- Prepared for automatic changing
- Prepared for Gripper 26937-00, Gripper pin set S952905 (not included)
- Example of suitable chucks: C952010, C952210
- Weight: 3.5 kg.

Universal adapter, DelphinShort, C952920
This DelphinShort universal fixed adapter has a very rugged and stable fixation interface to mount customer specific holders and parts fixation units. Spacer in between universal adapter and customer fixation can be offered on request.

- Recommended max load: 25 kg
- Prepared for automatic changing
- Prepared for Gripper 26937-00, Gripper pin set S952905 (not included)
- Example of suitable chucks: C952010, C952210
- Weight: 5.2 kg.
**DelphinShort Twin frame – presetting**

**DelphinShort, TwinFrame, 200x220, C954000**
The Twin Frame 200x220 can be used on the two Twinchucks (cc 100 mm) of the Frame machine equipment or also on individual DelphinShort Twin chucks (cc 100 mm) in WEDM machines.

The clamping range of 200x220 mm allows flat cubic parts up to a size of 200x220 mm to be clamped collisionfree on +4mm or on the zero line +0. With the use of the two clamping bars C950610 and/or C950620, the clamping area can be individually adapted to the workpiece sizes.

- Material: INOX
- ID-Chip holder included in scope of delivery
- Prepared for automatic changing
- 4x Keyhole Pins for gripper in scope of delivery
- Weight 13.3 kg.

**To be completed with Gripper pin set, S952905, when using the gripper 26937-00**

**Clamping bar single sided, C950610**
**Clamping bar double sided, C950620**

- support Lips screwed
- support Lips “0” for workpiece clamping on Zero
- support “+4” for collisionfree workpiece clamping on +4 mm.

**Presetting station, DelphinShort Twin, C952980**
The 97mm high base beam is fixed onto the 500 x 800mm stoneplate and carries the DelphinShort Twin chuck. A 97 mm support leg is to check clearance underneath workpiece in order to ensure free from collision.

- Stone plate 800x500x100
- DelphinShort Twin chuck cc 100 mm
- Pneumatic control C254960
- Air pressure open : 5 – 10 bar
- Reference rails in X- & Y-axis
- Measuring stand with dial indicator
- Weight 160 kg.

**To be completed if needed with with Stand for Presetting Station, V000020**
**DelphinShort Twin accessories**

**Master pallet, DelphinShort Twin, C952060**
Enables quick, easy and highly accurate assembly and alignment of the DelphinShort Twin chucks on the table of the WEDM machine. Checking and readjustment of the machine equipment on the table of the WEDM machine.

**DelphinShort protective pallet for DelphinShort Twin chucks, C226330**
Chip, liquid and air pressure [turbo locking] protection for DelphinShort Twin chucks.

**Protective drawbar, DelphinShort, C226300**
Chip protection for DelphinShort chucks, seals centre bore, Z-support of chuck remains usable.
Material: plastic
- Dimensions: Ø26x21 mm
- M8 for dismounting.

**Clamping force meter, C288200**
Is used to measure the clamping force of a chuck.
For any DelphinShort chuck, use the Clamping force meter with Adapter C288250.

**Adapter, C950280**
For mounting Unimatic holders in WEDM, Macro and MacroTwin mounting heads.

**Adapters ICS**
For mounting ICS holders in WEDM onto Macro or MacroTwin mounting heads.
- Adapter ICS A, C457940
- Adapter ICS B, C457960
- Adapter ICS C, C457980

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System 3R – DelphinShort and Frames for wire EDM
DelphinShort Twin accessories

Code carrier 4 mm, 3R-863.01-10
With a pre-programmed unique identity.
• Supplied in sets of 10.

Spare parts, DelphinShort, S225005
For DelphinShort chucks. Includes O-rings, compression springs, balls, screws and assembly tool.

Dental application example:
DelphinShort Levelling Adapter with mounting head Macro and a vertical adapter,
Frames for the CUT series

Large palletising systems adapted to the WEDM machine table dimensions

Frames
The rugged design enables large workpieces to be clamped and changed in the WEDM machine with repeatable accuracy. Adjusting/designing the clamping bars to the specific workpieces significantly reduces the clamping and alignment effort.

Components
The basic frame equipment comprises the following components:
- Machine equipment
- Pneumatic control
- Frame
- Clamping bars

Options
The frame equipment can be complemented with the following components if desired:
- Gripper (to robot or lifting device)
- Presetting station
- Machine equipment to measuring machine
Frames for the CUT series

Machine equipment
The machine equipment consist of two identical DelphinShort Twin chucks. On the larger machines we have in addition 4 corner Z-supports and 2 middle Z-supports. The two DelphinShort Twin Baseplates build the reference clamping system for the DelphinShort Frame on the WEDM machine. They guarantee best possible repetition accuracy and strong fixation of the DelphinShort Frame on the WEDM machine.

The corner Z-supports are used on the CUT P 550 & the CUT X 500 to give more stability to the on the machine clamped frame. The middle Z-supports help to reduce the deflection of a heavy loaded DelphinShort Frame.

Frame
This is the „pallet“ in a frame equipment. It includes the reference elements which define the position of the frame on the WEDM machine table along with the chucks. It is also the carrier element for the different clamping bars.

Clamping bars
Mounted into the frame, these provide the actual workpiece clamping, either singly or normally as a pair. System 3R provides three types of clamping bars as standard, each as single or double-sided versions.

- Clamping bar with fixed support lips: workpiece can be clamped at „0“ or collision-free at „+4“ using spacer plates (included)
- Clamping bar with screwed support lips: depending on the type of support lips, workpiece can be clamped at „0“ or collision-free at „+4“
- Combi clamping bar with screwed support lips: workpiece is clamped at „0“ or collision-free at „+4“

Combi clamping bars are prepared for using the 3R-239 ruler accessory.
DelphinShort alignment and reference ruler

This reference element for the machine equipment is used for the following:

- Enables quick, simple and top-precision mounting and alignment of both DelphinShort Twin Baseplates on the WEDM machine table.
- Checking and readjustment of the machine equipment on the WEDM machine table
- To determine X, Y and C of the clamping system of the 2 DelphinShort Twin chucks.

Pneumatic control system

This system is required for controlling the two DelphinShort Twin Baseplates on the machine equipment in order to clamp or release the frame on the machine. It also supplies the Z-supports with cleaning air.

All tubings and air distribution blocs are included in the machine equipment and ready to be connected to the controls of the automation.

For non automated operation we have a specific manual 3-way pneumatic valve in the portfolio.

Set of clamping screws / brackets

The clamping bars are all fitted with brackets which allow plates and workpieces of 15 – 30 mm thickness to be clamped. For clamping thinner or thicker plates and parts the set of clamping screws / brackets provides the required screws, set screws and brackets in stainless steel.
Presetting station
The presetting station enables the frame to be loaded and unloaded with work-pieces outside the WEDM machine. However, the main use of the presetting station is to align the workpieces very precisely level and plane-parallel to the stone plate in the frame.

The entire set-up on the stone plate can also be mounted directly on a 3D measuring machine. This enables the workpieces to be measured while clamped in the frame.

Gripper
A gripper fitted to the size of the frame is required for handling the frame with a robot or a handling device (automatic or manual). These grippers are purely mechanical fork or trapezoid grippers which operate without any external power.

Manual Handling
We recommend using a lifting device with an adjustment for the lifting interface on the frame when manual handling the frame.

GF AgieCharmilles
CUT P 350 Pro
Frames, accessories and layouts

CUT P 350 Pro – Basic WEDM frame tooling

<table>
<thead>
<tr>
<th>Description</th>
<th>Art. number</th>
</tr>
</thead>
<tbody>
<tr>
<td>Machine equipment CUT P 350 Pro</td>
<td>C952000</td>
</tr>
<tr>
<td>Frame CUT P 350 Pro</td>
<td>C952040</td>
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<tr>
<td>PN valve for manual operations</td>
<td>C254960</td>
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<tr>
<td>Clamping bar 230, lips fixed, single</td>
<td>C917380</td>
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<tr>
<td>Clamping bar 230, lips fixed, double</td>
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<tr>
<td>Clamping bar 230, lips screwed, single</td>
<td>C917080</td>
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<tr>
<td>Clamping bar 230, lips screwed, double</td>
<td>C917090</td>
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<tr>
<td>Combi clamping bar 230, single</td>
<td>C917480</td>
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<tr>
<td>Combi clamping bar 230, double</td>
<td>C917490</td>
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CUT P 350 Pro – WEDM frame tooling accessories

<table>
<thead>
<tr>
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<tbody>
<tr>
<td>Frame presetting station CUT P 350 Pro</td>
<td>C952080</td>
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<tr>
<td>Stand for presetting station 1000/630</td>
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<tr>
<td>Reference ruler for frames CUT P 350 Pro</td>
<td>C952050</td>
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<tr>
<td>Set of clamping screws / brackets</td>
<td>C860200</td>
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</table>
CUT P 350 Pro – WEDM Frame tooling

Machine equipment C952000

Frame C952040

Clamping bar 230
Lips fixed
C917380
C917390

Clamping bar 230
Lips screwed
C917080
C917090

Combi clamping bar 230
C917480
C917490
GF AgieCharmilles
CUT P 550 Pro
Frames, accessories and layouts

CUT P 550 Pro – Basic WEDM frame tooling

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<td>Machine equipment CUT P 550 Pro</td>
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<td>Frame CUT P 550 Pro</td>
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<td>PN valve for manual operations</td>
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CUT P 550 Pro – WEDM frame tooling accessories

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<td>Set of clamping screws / brackets</td>
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</table>
CUT P 550 Pro – WEDM Frame tooling

Machine equipment C952100

Frame C952140

Clamping bar 360
Lips fixed
C917330
C917360

Clamping bar 360
Lips screwed
C917030
C917060

Combi clamping bar 360
C917430
C917460

System 3R – DelphinShort and Frames for wire EDM
GF AgieCharmilles
CUT X 350 & CUT 2000
Frames, accessories and layouts

CUT X 350 – Basic WEDM frame tooling

<table>
<thead>
<tr>
<th>Description</th>
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<tr>
<td>Machine equipment CUT X 350</td>
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<tr>
<td>Frame CUT X 350</td>
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CUT X 350 – WEDM frame tooling accessories

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<td>Stand for presetting station 1200/800</td>
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<tr>
<td>Reference ruler for Frames CUT X 350</td>
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<tr>
<td>Set of clamping screws / brackets</td>
<td>C860200</td>
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</table>
CUT X 350 – WEDM Frame tooling

Machine equipment C952200

Frame C952240

Clamping bar 290

Lips fixed
C917320
C917350

Lips screwed
C917020
C917050

Combi clamping bar 290

C917420
C917450
GF AgieCharmilles
CUT X 500 & CUT 3000
Frames, accessories and layouts

CUT X 500 – Basic WEDM frame tooling

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</table>
CUT X 500 – WEDM frame tooling

Clamping bar 360
- Lips fixed
  - C917330
  - C917360

Clamping bar 360
- Lips screwed
  - C917030
  - C917060

Combi clamping bar 360
- C917430
- C917460

Machine equipment C952300

Frame C952340
Frame tooling accessories

Set of clamping screws & brackets, C860200
Set of M8 screws & set screws in various lengths. Brackets to clamping bars for clamping of plates and parts thinner than 15 mm.

Pneumatic control unit, DelphinShort, C254960
Control unit for individual DelphinShort chucks and WEDM frames with manual operation.
- Including 10 m tube Ø6 mm and 3 fittings.
WEDM Frames applications

WEDM Cell with CUT P 550 Pro, stationary Transformer, Rack magazine for the WEDM Frames and CMM outside the cell also used as loading station for the large WEDM frames
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