

System 3R

Tooling

Delphin – modular Clamping System



Design and quality by System 3R

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Modern production plants equip their production facilities with a modular clamping system.



System 3R Delphin - the modular clamping system

Preconditions for efficient, economical and flexible production

Every production plant uses clamping elements, jigs, fixtures, reference pallet systems to be able to clamp the range of workpieces machined efficiently and economically.

The Delphin modular zero-point clamping system allows the machine table to be equipped individually with position-determining chucks.

It thus allows the complete work area to be used and offers substantial advantages in relation to reducing setting times and enhanced flexibility thanks to substitution of preset workpieces.

Consequently, it opens up entirely new options for manual and automated workpiece change.



Setting outside of the machine

Workpieces can be set up outside the machine. By this the setting times in the machine can be reduced up to 90% and the machining hours become maximised.

Standardisation of productions

The standardisation of the interfaces on the machines allows a more efficient and more flexible handling of workpieces and devices in the production.

The change from one machine to another happens very fast and without any long repositioning.

Unmanned production by automation

By the Delphin zero-point system pallets can be clamped automatically and accurate in position. The automated operation then opens the entire working potential of the machine.

Modernisation of existing machines by retrofitting with Delphin

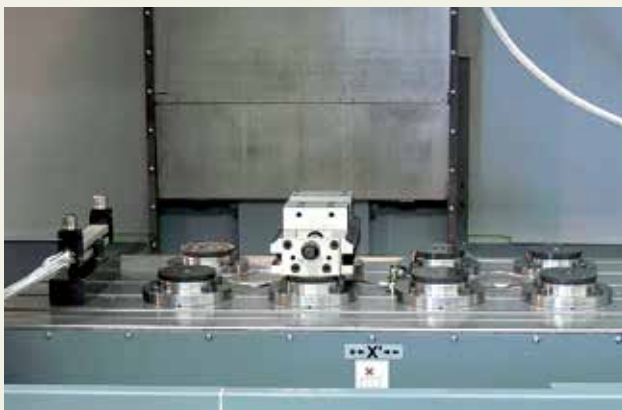
Existing machines without a clamping system can be retrofitted with the Delphin clamping system at any time to increase their productivity.

More speed and productivity

Faster retooling means not only more working hours but also a higher productivity and shorter delivery times.

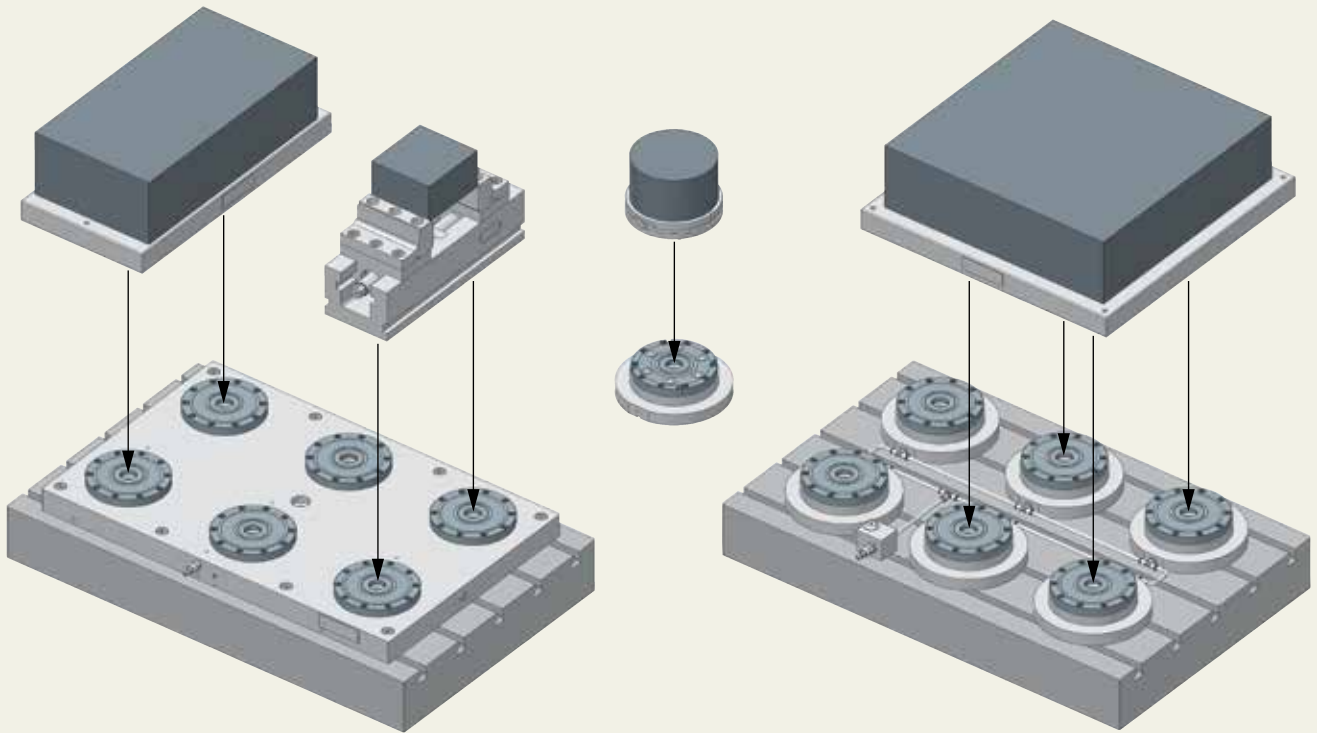
More flexibility

Job interruptions for an express order are no problem. Retooling in seconds provides the required level of flexibility.



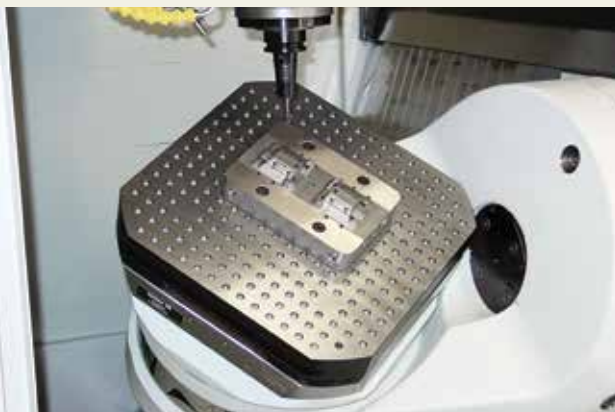
Advantages of modular clamping

By the modularly built-up pallets and devices can be combined arbitrary. The machine table can be used optimal. There can be clamped large single pallets or multiple smaller pallets / devices.



System 3R offers you the support you need for your success!

System 3R offers its customers comprehensive services and support in all phases, even after they buy the system. This is because we provide not only products but also solutions for productivity enhancement.



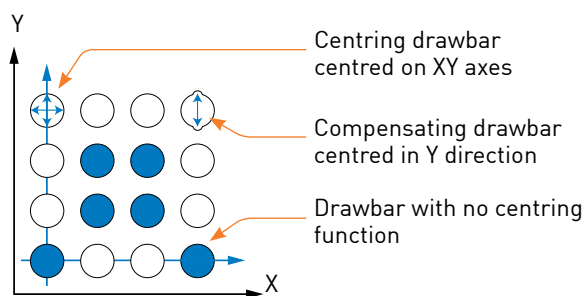
Function of the drawbars

Centring free of play

One special feature in relation to modular equipping of the machine tables is the option for arrangement and number of chucks. Regardless of the requirements of the application, you determine the quantity and the particular centre distance with which you wish to equip the machine table.

Our recommendation: use at least 4 chucks per workpiece or work with pallets.

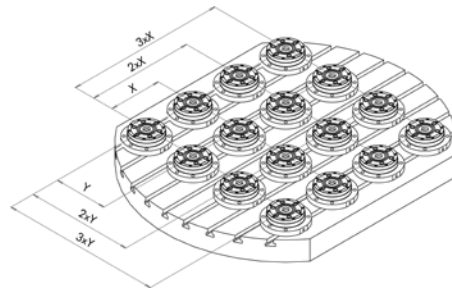
The drawbars are mounted directly in the device or workpiece. Centring of the conical face of the centring and compensating drawbars free of play achieves maximum accuracy.



Centre distance - determined by you yourself!

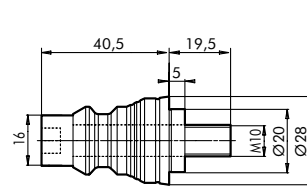
The centre distance is the centre-to-centre distance between the relevant chucks. The recommended centre distance is the default centre distance of 250 mm or 200 mm (with HCP also 100 mm are possible).

A centre distance in X or Y direction should be selected quadratically. This offers the advantage that, for instance, a device or workpiece can be indexed in the case of machining operations on a 3-axle machine.



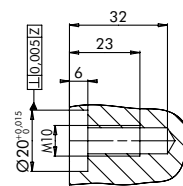
Attachment of Delphin drawbars

to devices and auxiliary clamping equipment or workpieces



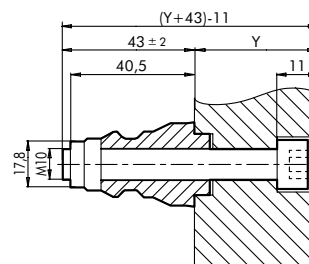
Drawbar, including screw (DIN 912, 12.9)

Recommended tightening torque: Aluminium: 40 Nm / Steel: 50 Nm



Installation dimensions for drawbar - fixed in pallet

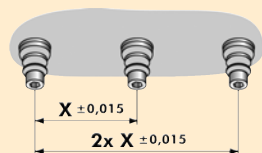
screw length:



Drawbar - fixed through pallet. Tightening torque of the screw 50 Nm.

Recommended centre distance X/Y:
250 mm / 200 mm / 100 mm (only HCP)

Tolerance to be complied with



Recommended for maximum accuracy

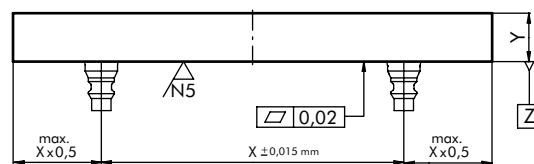
// 0,005 Z Recommendations based on steel 1.2316

The recommendation may vary depending on machining forces, materials and number of chucks.

Please contact our technical consultants.

Please submit the table drawings to us wherever possible. This will assist us greatly to elaborate your quota-tion quickly and precisely.

Size, flatness and surface condition of devices /plates

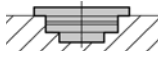


Y: 30 - ca. 60 mm

Dependent on centre distance and pallet material

Built-in and built-up options

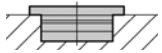
Built-in



Installation in machine tables or base plates:

The piston chamber of the chuck is integrated in the machine table or base plate.

Semi built-in



With O-ring at the connection

Installation in machine tables:

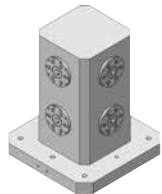
the O-ring serves to seal the pneumatic and/or hydraulic supply lines.

With connection thread

Installation in clamping turrets or twin brackets etc. with through-holes:

Pneumatic and/or hydraulic supply lines are connected with fittings to the chucks.

Turrets

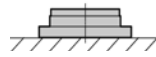


Turrets without drawbars in the base plate remain permanently on the machine table.

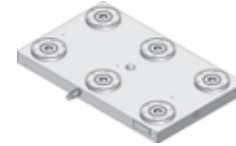
Turrets with drawbars in the base plate can be fitted and removed quickly on Delphin base plates. This means that the machine table is also available for jigs and fixtures.

Turrets are available customised.

Built-up and base plates



Without mounting bores



Mounting on machine tables, jigs or fixtures:

The mounting bores for mounting on the machine table are made by the customer.

With mounting bores



Mounting on machine tables, jigs or fixtures:

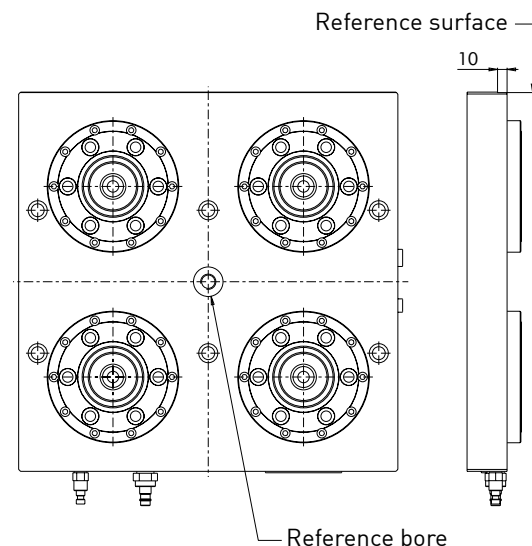
The mounting bores for mounting on the machine table are made by the works; mounting bore pattern in accordance with customer's specifications. When ordering, please specify the machine table data.

Reference surfaces on the base plates

The standard Delphin base plates feature a reference bore at the centre of the base plate. It can be used to orientate the base plate approximately to the centre (± 0.025 mm).

Subsequent alignment at an angle uses a reference surface on the rear side.

As soon as the base plate has been approximately orientated, the base plate can be aligned precisely using the conical centring lugs of the chucks.



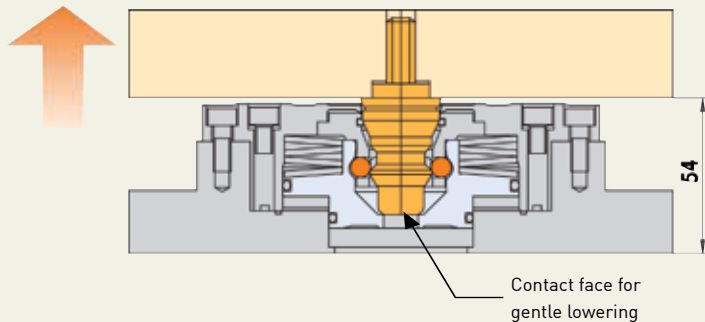
Advantages of the hydraulic system

if used horizontally

Protection of the Z-support of the chuck when loading heavy devices

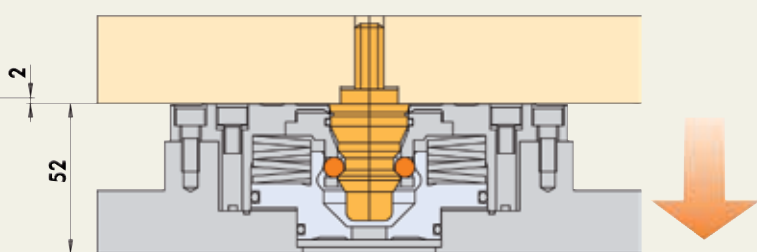
Release with lift-off

Device raised 2 mm



Clamping

Gentle lowering when clamping

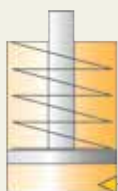


Gentle clamping

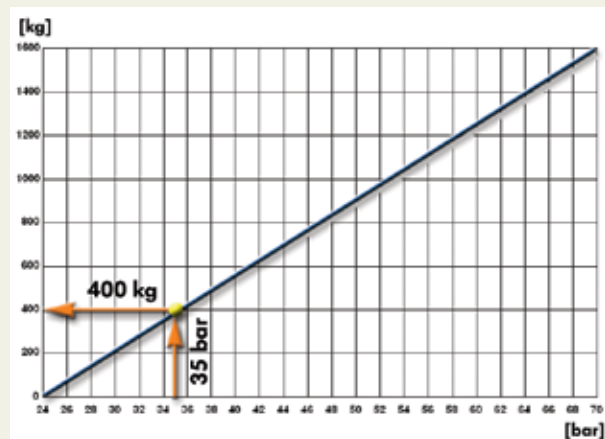
One major advantage of using hydraulic systems instead of pneumatic systems is controlled lowering of the workpieces during the clamping operation. The workpiece is lowered slowly onto the Z-supports, consequently protecting them.

The Z-supports are cleaned during this clamping operation on the HHP/HCP/HHPA chuck.

This increases accuracy over the years and thus prolongs the service life of the Delphin chucks.



30-70 bar
(open and lift-off)



Example:

A HSP/HHP/HHPA chuck can raise a weight of 400 kg at an hydraulic pressure of 35 bar. With 4 chucks, this results in a total workpiece weight of 1600 kg.

Advantages of pneumatic

Application for vertical installation

In the case of vertical installation, there is no lifting function. For example, the pneumatic chucks (PHP, PSP) are better-suited on turrets.

Gentle clamping is not advisable vertically and the connecting with pneumatic hoses is simpler.



6 bar
(open)



Automation with Delphin

Automation demands special preconditions in a clamping system, and these are already met by the Delphin and Delphin BIG versions.

Depending on the Delphin system, activation is either pneumatic or hydraulic. The control signals can be sent from the machine or from the robot to the corresponding machine valves which then perform activation of the Delphin system.

There is also the option of activating a Delphin hydraulic unit directly by control air.

On the Delphin BIG system, the control signals can be routed directly to the hydraulic unit. In this case, no valves are required on the machine for controlling the Delphin BIG chucks.

Suitable standard automation pallets can be found in accessories.

Should you require different pallet sizes, please contact your System3R salesperson.



OEM Automation with Delphin

Integration of the Delphin chucks directly into the machine table



machine table



robot brings the pallet



pallet on machine table



machining

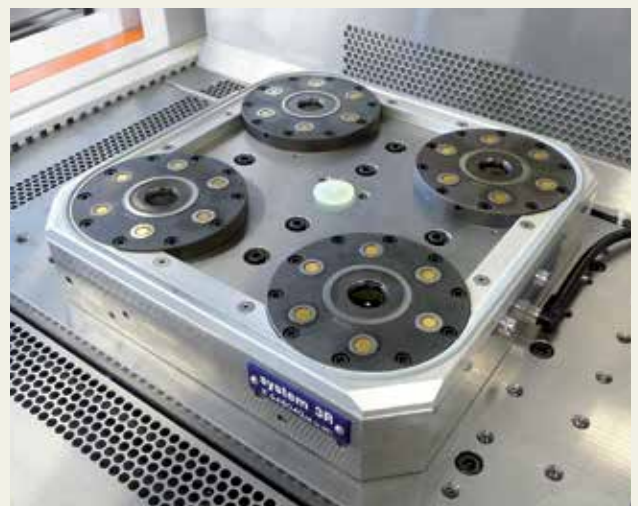
Delphin in EDM machines

Specific products optimised for this application must be used for Delphin in EDM machines.

On EDM solutions, there are certain differences by comparison with other applications.

The chucks must also always remain dry in the flooded machine compartment.

For this, seal rings or seal frames are fitted on the chucks, and the drain holes are replaced by lateral connection holes.



Specifications Delphin

Delphin	HCP	HSP/HHP/HHPA	PSP/PHP/PHPA	BIG
Workpiece weight recommended	<1000 kg	<2000 kg	<2000 kg	<10'000 kg
Centre distance recommended	100 - 200 mm	200 - 400 mm	200 - 400 mm	400 - 1000 mm
Clamping force	15 kN	15 kN	13 kN	50 kN
Holding force	60 kN	60 kN	60 kN	100 kN
Presence control	yes	no / yes / yes	no / yes / yes	yes
Lift-off function	yes, 1 mm	yes, 2 mm	no	yes, 2 mm
Releasing	hydraulic 30-70 bar	hydraulic 30-70 bar	pneumatic 6 bar	hydraulic 40-60 bar
Clamping	mechanical	mechanical	mechanical	hydraulic 30 bar, mechanical



The hydraulic system

Delphin HSP
for manual equipping



Delphin HHP
for manual and automated equipping



Delphin HHPA
for automation



Delphin HCP
The compact hydraulic system
for manual and automated equipping



The pneumatic system

Delphin PSP
for manual equipping



Delphin PHP
for manual and automated equipping



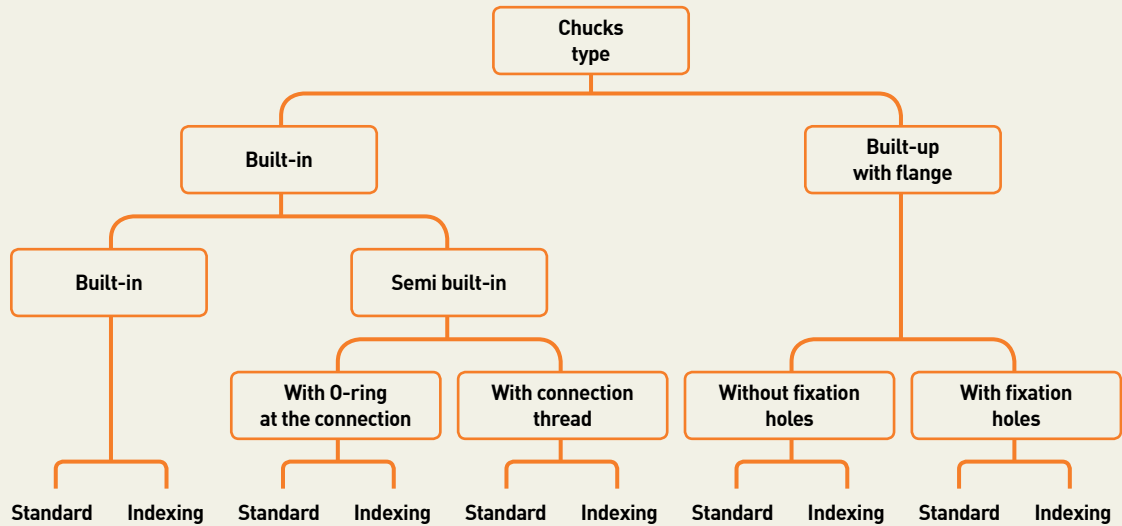
Delphin PHPA
for automation






































Delphin BIG
The hydraulic system for large part
manufacturing, suitable for automation



Overview of Delphin chucks



	Standard	Indexing	Standard	Indexing	Standard	Indexing	Standard	Indexing	Standard	Indexing	Page
HCP											13-16
	C 220 000		C 220 100		C 220 120						
HSP											17-21
	C 260 000				C 260 120		C 260 310		C 260 320		
HHP											22-26
	C 280 000	C 280 050	C 280 100	C 280 150	C 280 120	C 280 170	C 280 310	C 280 350	C 280 320	C 280 360	
HHPA											27-30
	C 283 000						C 283 310		C 283 320		
PSP											31-36
	C 240 000				C 240 120		C 240 310		C 240 320		
PHP											37-41
	C 290 000	C 290 050			C 290 120	C 290 170	C 290 310	C 290 350	C 290 320	C 290 360	
PHPA											42-45
	C 293 000						C 293 310		C 293 320		

Recommendation

We always recommend that workpieces, jigs or fixtures be clamped with at least four Delphin chucks.

If this is not possible, chuck the workpiece, jig or fixture to a pallet or select cutting parameters accordingly.



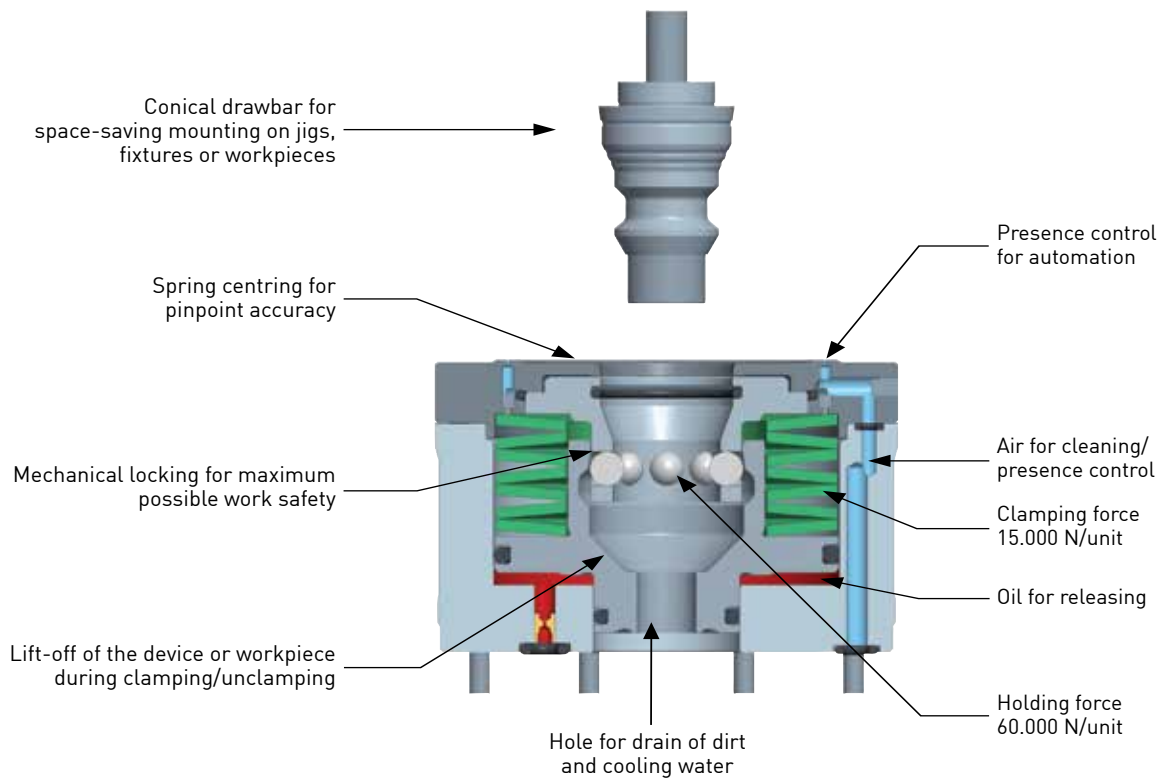
Delphin – Chuck HCP

Hydraulic Compact Performance

The compact hydraulic system for manual and automated equipping

Your advantages

- ✓ Combination of positioning cone and spring-loaded centring for maximum accuracy
- ✓ Low-wear and precise in the long term
- ✓ Lift-off function for protection of the Z-support of the chuck when loading heavy devices
- ✓ For manual and automated equipping
- ✓ Suitable for milling and measuring machines
- ✓ Simple drawbar mounting
- ✓ All-around Z-support ring for protecting the drawbar bore against dirt



Specifications

- Repeat accuracy < 0.005 mm
- Mechanical clamping by spring force
- Hydraulic pressure to release 30 to 70 bar
- Lift-off of the devices during releasing
- Material chuck: stainless steel, hardened and ground
- Material flange: stainless steel, heat pre-treated



Delphin drawbars
Centring in 2 axes / 1 axis / without centring

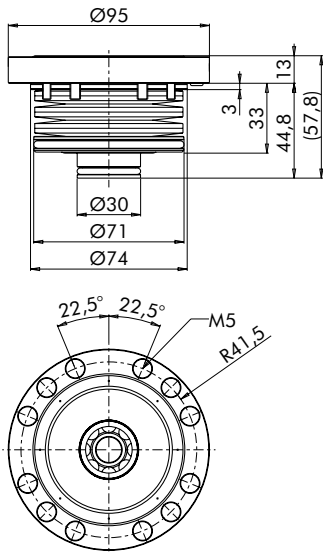
Product overview HCP

	Item number	Page		
Chucks				
Built-in HCP	C220 000	16		
Semi built-in HCP with O-ring	C220 100	16		
Semi built-in HCP with thread	C220 120	16		
Base plates				
	Centre distance [mm]	without mounting bores	with mounting bores	
Base plate with 2 chucks HCP	100	C221 460	C224 460	16
Base plate with 2 chucks HCP	200	C221 470	C224 470	16
Base plate with 4 chucks HCP	100	C221 510	C224 510	16
Base plate with 4 chucks HCP	200	C221 520	C224 520	16
Base plate with 6 chucks HCP	100	C221 560	C224 560	16
Base plate with 6 chucks HCP	200	C221 570	C224 570	16
Control units				
Hydraulic pump hybrid with control box (manual)	C287 150	49		
Hydraulic pump hybrid without control box (automation)	C287 160	49		
Hand pump	C287 120	49		
Drawbar fixing from the bottom				
Set for 2 chucks or base plate with 2 chucks	S812 000	47		
Set for 4 chucks or base plate with 4 chucks	S812 100	47		
Set for 6 chucks or base plate with 6 chucks	S812 200	47		
Drawbar fixing from top				
Set for 2 chucks or base plate with 2 chucks	S812 010	48		
Set for 4 chucks or base plate with 4 chucks	S812 110	48		
Set for 6 chucks or base plate with 6 chucks	S812 210	48		
Automation pallets				
Automation pallets for 4 chucks, centre distance 200 mm	C282 730 / C282 750	57		
Protective pallet HCP				
	C286 140	53		
Miscellaneous				
Pre-centring spigot / pre-centring bush	C286 160 / C286 150	54		
Locking spigot	C286 060	53		
Protection support drawbar	C286 050	53		
Z support	C286 210	52		
Sets accessories fixation				
Set accessories fixation M8	C289 100	55		
Set accessories fixation M10	C289 110	55		
Spare parts for chuck HCP				
	S840 040	59		

Installation and mounting dimensions HCP

Chuck HCP built-in

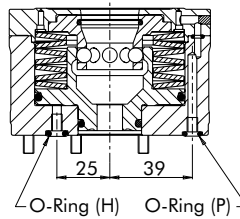
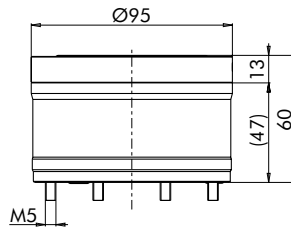
(in machine table or base plate)



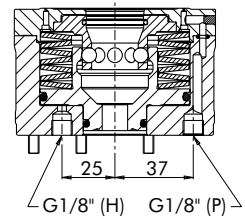
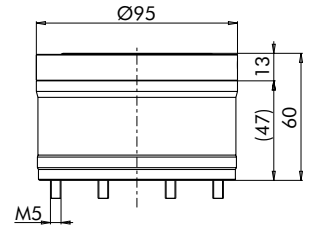
Chuck HCP semi built-in

(in machine table or clamping turret)

C 220 100
Flange with
O-ring at the connection



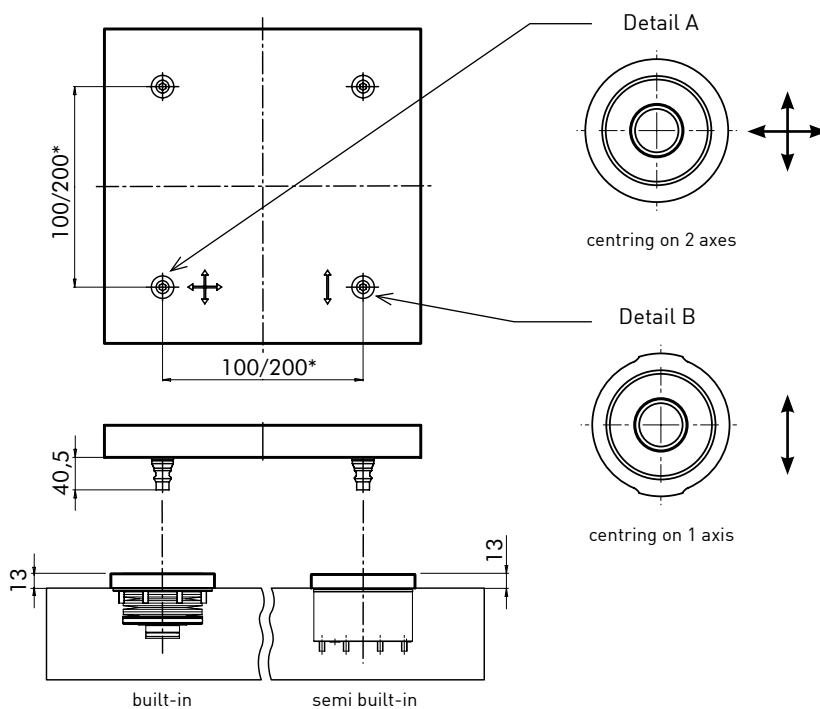
C 220 120
Flange with
connection thread



H= Hydraulic
P= Pneumatic

Plate with Delphin drawbars

(example)



* recommended centre distance

Delphin HCP

Chuck HCP built-in

C 220 000

For simple installation in the machine table or in a base plate.

- Clamping force: 15.000 N
- Holding force: 60.000 N
- Lift-off during unclamping: 1 mm
- Hydraulic pressure: 30 - 70 bar
- Air pressure: 6 bar
- Accuracy: < 0.005 mm
- Dimensions: Ø 95 x 58 mm



Chuck HCP semi built-in (with O-ring)

C 220 100

For simple installation in the machine table or in a clamping turret (cube or bracket).

- Clamping force: 15.000 N
- Holding force: 60.000 N
- Lift-off during unclamping: 1 mm
- Hydraulic pressure: 30 - 70 bar
- Air pressure: 6 bar
- Accuracy: < 0.005 mm
- Dimensions: Ø 95 x 60 mm



Chuck HCP semi built-in (with thread)

C 220 120

For simple installation in a clamping turret (cube or bracket).

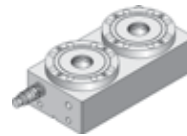
- Clamping force: 15.000 N
- Holding force: 60.000 N
- Lift-off during unclamping: 0,5 mm
- Hydraulic pressure: 30 - 70 bar
- Air pressure: 6 bar
- Accuracy: < 0.005 mm
- Dimensions: Ø 95 x 60 mm



Base plate with 2 chucks HCP

For installation on a machine table.

- Material: steel, heat pre-treated and ground
- Nipple is incl. in scope of delivery

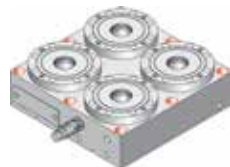
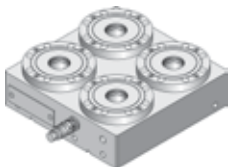


Centre distance	100	200
Without mounting bores	C 221 460	C 221 470
With mounting bores When ordering, please specify the machine table data	C 224 460	C 224 470
Dimensions [mm]:	98x63x198	148x63x348

Base plate with 4 chucks HCP

For installation on a machine table.

- Material: steel, heat pre-treated and ground
- Nipple is incl. in scope of delivery



Centre distance	100	200
Without mounting bores	C 221 510	C 221 520
With mounting bores When ordering, please specify the machine table data	C 224 510	C 224 520
Dimensions [mm]:	198x63x198	348x63x348



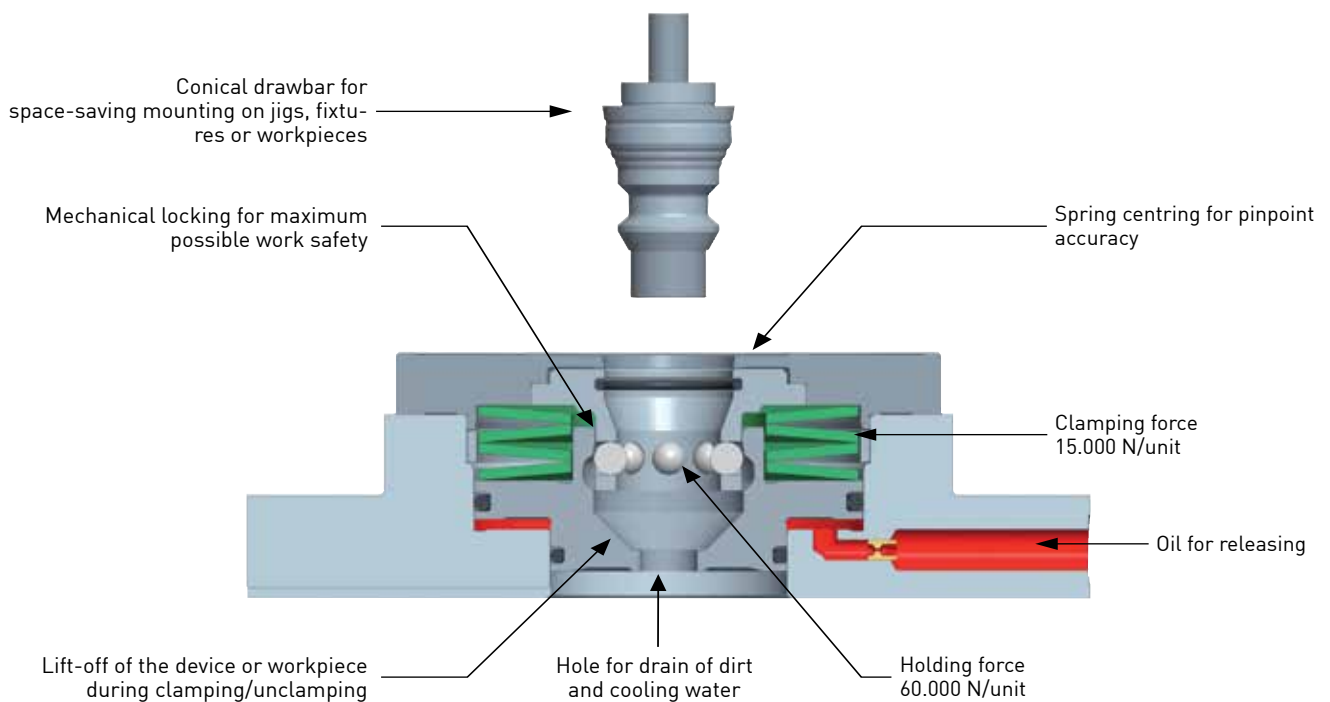
Delphin – Chuck HSP

Hydraulic Standard Performance

Your advantages

- ✓ Combination of positioning cone and spring-loaded centring for maximum accuracy
- ✓ Low-wear and precise in the long term
- ✓ Lift-off function for protection of the Z-support of the chuck when loading heavy devices
- ✓ For manual equipping
- ✓ Suitable for milling and measuring machines
- ✓ Simple drawbar mounting
- ✓ All-around Z-support ring for protecting the clamping spigot bore against dirt

The hydraulic system for manual equipping



Specifications

- Repeat accuracy < 0.005 mm
- Mechanical clamping by spring force
- Hydraulic pressure to release 30 to 70 bar
- Lift-off of the devices during releasing
- Material chuck: stainless steel, hardened and ground
- Material flange: stainless steel, heat pre-treated



Delphin drawbars
Centring in 2 axes / 1 axis / without centring

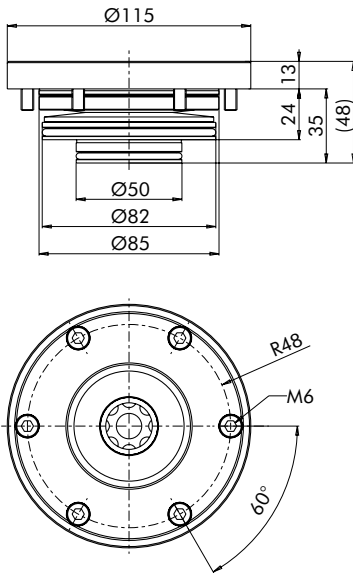
Product overview HSP

	Item number		Page
	without mounting bores	with mounting bores	
Chucks			
Built-in HSP	C260 000		20
Semi built-in HSP (with thread)	C260 120		20
Built-up HSP	C260 310	C260 320	20
Base plates			
	Centre distance [mm]		
Base plate with 2 chucks HSP	250	C261 450 C264 450	21
Base plate with 2 chucks HSP	200	C261 470 C264 470	21
Base plate with 4 chucks HSP	250	C261 500 C264 500	21
Base plate with 4 chucks HSP	200	C261 520 C264 520	21
Base plate with 6 chucks HSP	250	C261 550 C264 550	21
Base plate with 6 chucks HSP	200	C261 570 C264 570	21
Cover plates			
Cover plate type A		C287 300	56
Cover plate type B		C287 310	56
Cover plate type C		C287 320	56
Control units			
Hydraulic pump hybrid with control box (manual)		C287 150	49
Hand pump		C287 120	49
Connection block HSP (including fittings)			
		C286 100	50
Connection equipment without cover plate			
Connections for 2 chucks		S816 600	51
Connections for 4 chucks		S816 700	51
Connection equipment with cover plate			
Connections for 2 chucks		S816 600	51
Connections for 4 chucks		S816 700	51
Drawbar fixing from the bottom			
Set for 2 chucks or base plate with 2 chucks		S812 000	47
Set for 4 chucks or base plate with 4 chucks		S812 100	47
Set for 6 chucks or base plate with 6 chucks		S812 200	47
Drawbar fixing from top			
Set for 2 chucks or base plate with 2 chucks		S812 010	48
Set for 4 chucks or base plate with 4 chucks		S812 110	48
Set for 6 chucks or base plate with 6 chucks		S812 210	48
Pallets			
Pallets for 2 chucks		C282 600 / C282 630	57
Pallets for 4 chucks		C282 620 / C282 650	57
Protective pallet HSP			
		C266 040	53
Miscellaneous			
Pre-centring spigot / pre-centring bush		C286 160 / C286 150	54
Locking spigot		C286 060	53
Protection support drawbar		C286 050	53
Z support		C286 210	52
Set accessories fixation M8 / M10 / M12			
		C289 100 / C289 110 / C289 120	55
Spare parts for chuck HSP			
		S840 000	59

Installation and mounting dimensions HSP

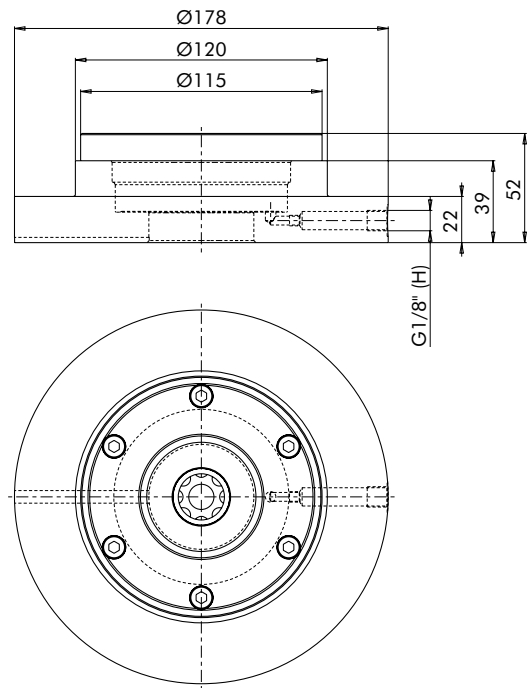
Chuck HSP built-in

(on machine table or base plate)



Chuck HSP built-up

(on machine table)



H= Hydraulic

Chuck HSP semi built-in

(in clamping turret)

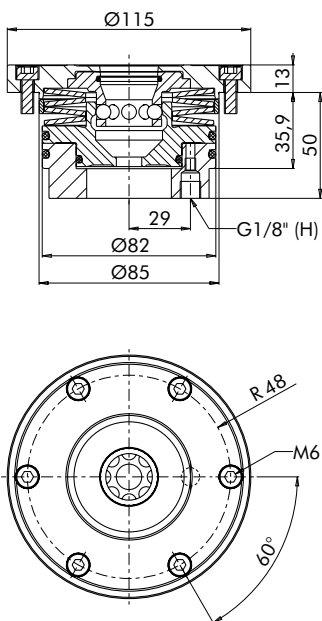
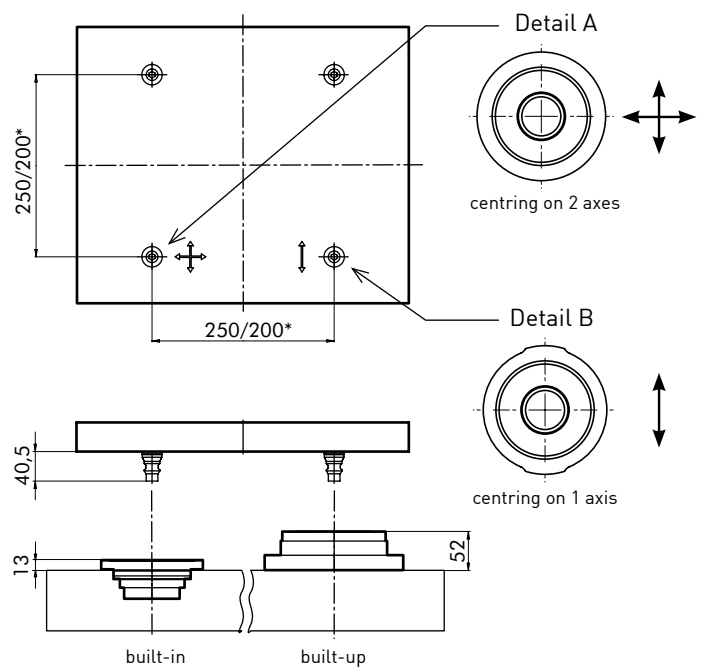


Plate with Delphin drawbars

(example)



* recommended centre distance

Delphin Chucks HSP

Chuck HSP built-in

C 260 000

For simple installation in the machine table or in a base plate.

- Clamping force: 15.000 N
- Holding force: 60.000 N
- Lift-off during unclamping: 2 mm
- Hydraulic pressure: 30 - 70 bar
- Accuracy: < 0.005 mm
- Dimensions: Ø 115 x 48 mm



Chuck HSP semi built-in (with thread)

C 260 120

For simple installation in a clamping turret (cube or bracket).

- Clamping force: 15.000 N
- Holding force: 60.000 N
- Lift-off during unclamping: 0,5 mm
- Hydraulic pressure: 30 - 70 bar
- Accuracy: < 0.005 mm
- Dimensions: Ø 115 x 63 mm



Chuck HSP built-up with flange without mounting bores

C 260 310

For installation on a machine table.

Mounting bores must be made by customer.

- Clamping force: 15.000 N
- Holding force: 60.000 N
- Lift-off during unclamping: 2 mm
- Hydraulic pressure: 30 - 70 bar
- Accuracy: < 0.005 mm
- Dimensions: Ø 178 x 52 mm



Chuck HSP built-up with flange with mounting bores

C 260 320

For installation on a machine table.

Please submit dimension diagram of the mounting bores.

- Clamping force: 15.000 N
- Holding force: 60.000 N
- Lift-off during unclamping: 2 mm
- Hydraulic pressure: 30 - 70 bar
- Accuracy: < 0.005 mm
- Dimensions: Ø 178 x 52 mm

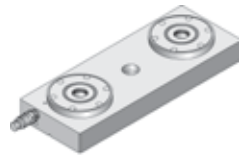


Delphin Base plates HSP

Base plate with 2 chucks HSP

For installation on a machine table.

- Material: steel, heat pre-treated and ground
- Hydraulic / air nipples are included in the price of the plate

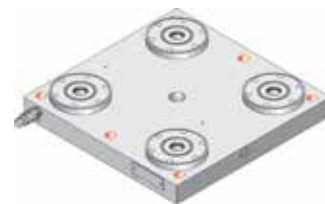
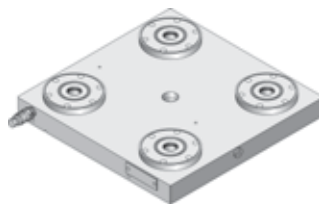


Centre distance	250	200
Without mounting bores	C 261 450	C 261 470
With mounting bores	C 264 450	C 264 470
When ordering, please specify the machine table data		
Dimensions:	148x55x398 mm	148x55x348 mm

Base plate with 4 chucks HSP

For installation on a machine table.

- Material: steel, heat pre-treated and ground
- Hydraulic / air nipples are included in the price of the plate

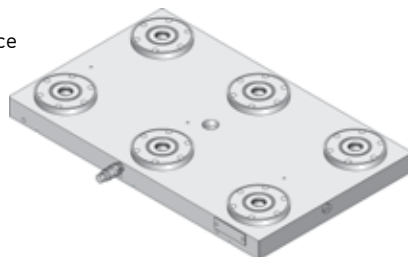


Centre distance	250	200
Without mounting bores	C 261 500	C 261 520
With mounting bores	C 264 500	C 264 520
When ordering, please specify the machine table data		
Dimensions:	398x55x398 mm	348x55x348 mm

Grundplatte mit 6 Spanneinheiten HSP

Für den Aufbau auf einen Maschinentisch.

- Material: steel, heat pre-treated and ground
- Hydraulic / air nipples are included in the price of the plate



Centre distance	250	200
Without mounting bores	C 261 550	C 261 570
With mounting bores	C 264 550	C 264 570
When ordering, please specify the machine table data		
Dimensions:	648x55x398 mm	548x55x348 mm

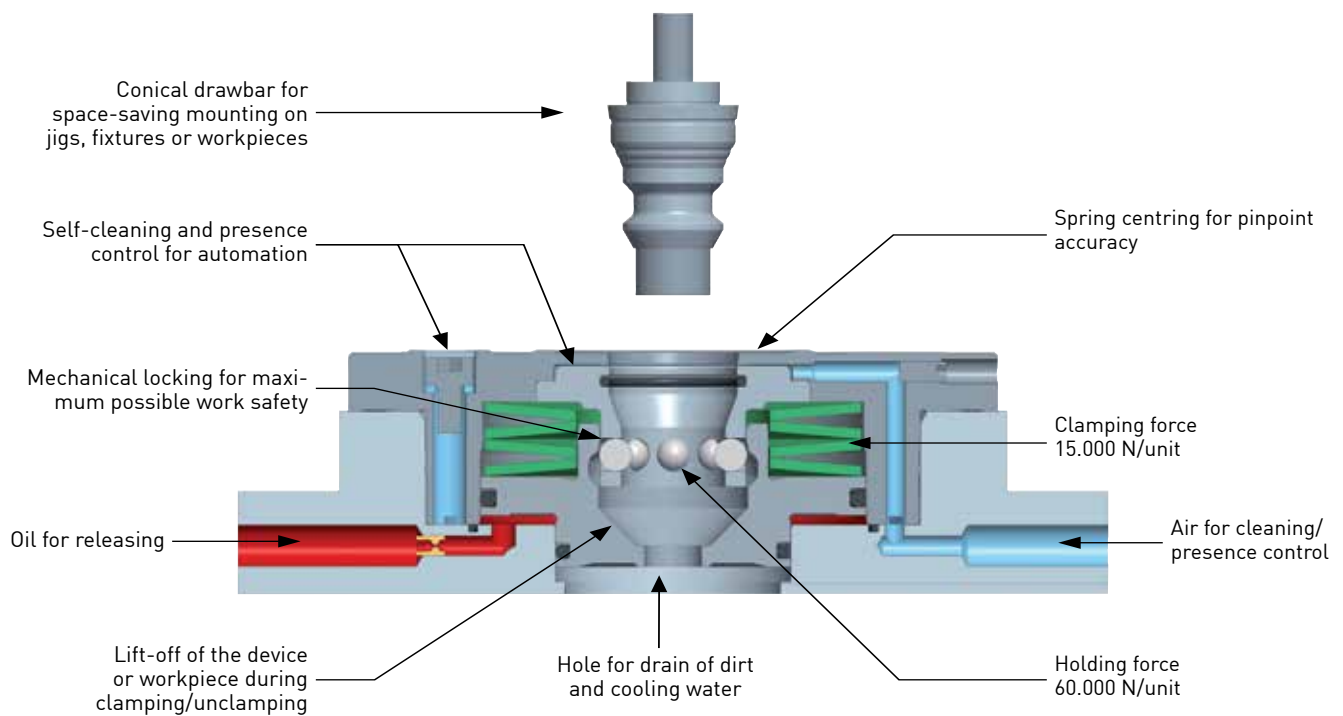
Delphin – Chuck HHP

Hydraulic High Performance

Your advantages

- ✓ Combination of positioning cone and spring-loaded centring for maximum accuracy
- ✓ Low-wear and precise in the long term
- ✓ Lift-off function for protection of the Z-support of the chuck when loading heavy devices
- ✓ For manual and automated equipping
- ✓ Suitable for milling and measuring machines
- ✓ Simple drawbar mounting
- ✓ All-around Z-support ring for protecting the drawbar bore against dirt

The hydraulic system for manual and automated equipping



Specifications

- Repeat accuracy < 0.005 mm
- Mechanical clamping by spring force
- Hydraulic pressure to release 30 to 70 bar
- Lift-off of the devices during releasing
- Material chuck: stainless steel, hardened and ground
- Material flange: stainless steel, heat pre-treated



Delphin drawbars

Centring in 2 axes / 1 axis / without centring

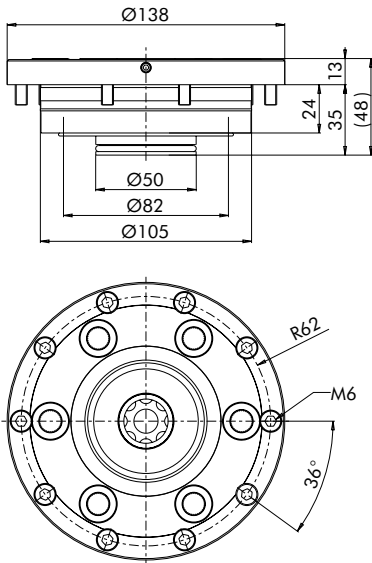
Product overview HHP

	Item number		Item number		Page	
	Standard		Indexing			
	without	with	without	with		
Mounting bores						
Chucks						
Built-in HHP	C280 000		C280 050		25	
Semi built-in HHP with O-ring	C280 100		C280 150		25	
Semi built-in HHP with thread	C280 120		C280 170		25	
Built-up HHP	C280 310	C280 320	C280 350	C280 360	25	
Base plates	Centre distance [mm]					
Base plate with 2 chucks HHP	250	C281 450	C284 450	C281 480	C284 480	26
Base plate with 2 chucks HHP	200	C281 470	C284 470	C281 490	C284 490	26
Base plate with 4 chucks HHP	250	C281 500	C284 500	C281 530	C284 530	26
Base plate with 4 chucks HHP	200	C281 520	C284 520	C281 540	C284 540	26
Base plate with 6 chucks HHP	250	C281 550	C284 550	C281 580	C284 580	26
Base plate with 6 chucks HHP	200	C281 570	C284 570	C281 590	C284 590	26
Cover plates						
Cover plate type A		C287 300			56	
Cover plate type B		C287 310			56	
Cover plate type C		C287 320			56	
Control units						
Hydraulic pump hybrid with control box (manual)		C287 150			49	
Hydraulic pump hybrid without control box (automation)		C287 160			49	
Hand pump		C287 120			49	
Connection block HHP (including fittings)		C286 030			50	
Connection equipment without cover plate						
Connections for 2 chucks		S816 000			51	
Connections for 4 chucks		S816 100			51	
Connection equipment with cover plate						
Connections for 2 chucks		S816 200			51	
Connections for 4 chucks		S816 300			51	
Drawbar fixing from the bottom						
Set for 2 chucks or base plate with 2 chucks		S812 000			47	
Set for 4 chucks or base plate with 4 chucks		S812 100			47	
Set for 6 chucks or base plate with 6 chucks		S812 200			47	
Drawbar fixing from top						
Set for 2 chucks or base plate with 2 chucks		S812 010			48	
Set for 4 chucks or base plate with 4 chucks		S812 110			48	
Set for 6 chucks or base plate with 6 chucks		S812 210			48	
Automation pallets						
Pallets for 4 chucks, centre distance 250 mm		C282 710 / C282 740			57	
Pallets for 4 chucks, centre distance 200 mm		C282 730 / C282 750			57	
Protective pallet HHP		C286 040			53	
Miscellaneous						
Pre-centring spigot / pre-centring bush		C286 160 / C286 150			54	
Locking spigot		C286 060			53	
Protection support drawbar		C286 050			53	
Z-Support		C286 210			52	
Indexing pins ground				S814 000	52	
Mounting device for indexing pins				C286 080	52	
Set accessories fixation M8 / M10 / M12		C289 100 / C289 110 / C289 120			55	
Spare parts for chuck HHP		S840 010			59	

Installation and mounting dimensions HHP

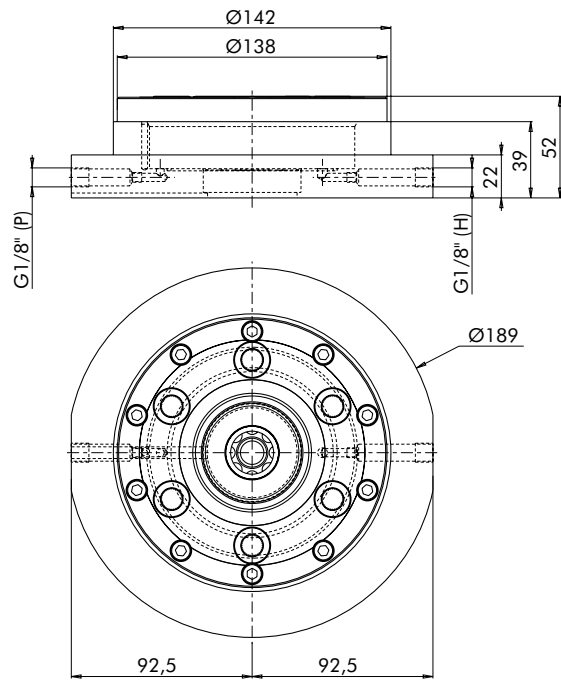
Chuck HHP built-in

(in machine table or base plate)



Chuck HHP built-up

(on machine table)

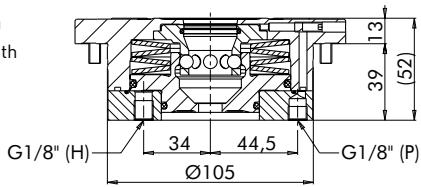


H= Hydraulic
P= Pneumatic

Chuck HHP semi built-in

(in machine table or clamping turret)

C 280 120
Flange with
thread



C 280 100
Flange with
O-ring

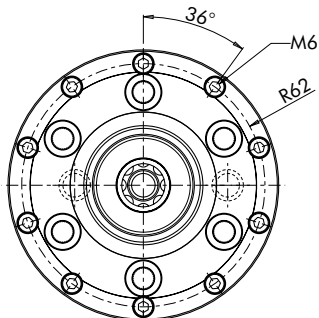
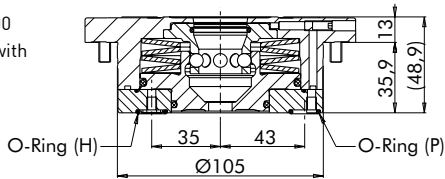
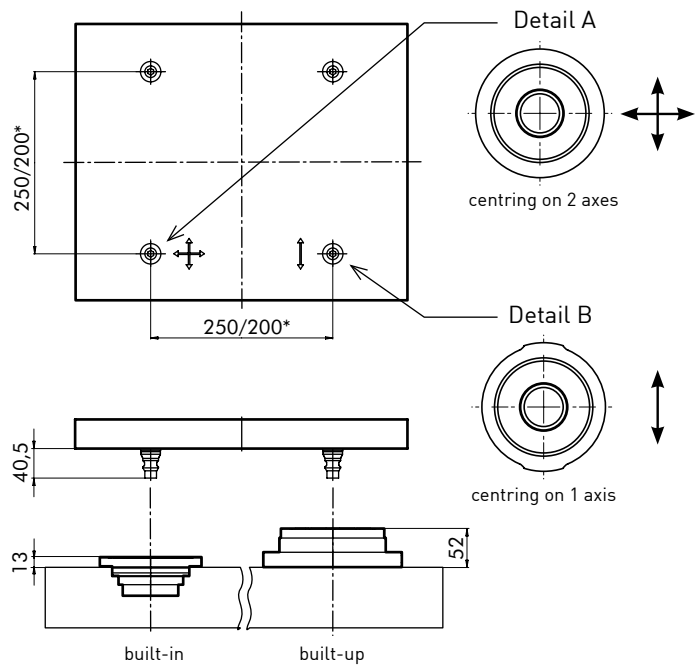


Plate with Delphin drawbars

(example)



* recommended centre distance

Delphin Chucks HHP

Chuck HHP built-in

For simple installation in the machine table or in a base plate.

- Clamping force: 15.000 N
- Holding force: 60.000 N
- Lift-off during unclamping: 2 mm
- Hydraulic pressure: 30 - 70 bar
- Air pressure: 6 bar
- Accuracy: < 0.005 mm
- Dimensions: Ø 138 x 48 mm

C 280 000

Standard



C 280 050

with indexing option



Chuck HHP semi built-in (with O-ring)

For simple installation in the machine table or in a clamping turret (cube or bracket).

- Clamping force: 15.000 N
- Holding force: 60.000 N
- Lift-off during unclamping: 2 mm
- Hydraulic pressure: 30 - 70 bar
- Air pressure: 6 bar
- Accuracy: < 0.005 mm
- Dimensions: Ø 138 x 49 mm

C 280 100

Standard



C 280 150

with indexing option



Chuck HHP semi built-in (with thread)

For simple installation in a clamping turret (cube or bracket).

- Clamping force: 15.000 N
- Holding force: 60.000 N
- Lift-off during unclamping: 0,5 mm
- Hydraulic pressure: 30 - 70 bar
- Air pressure: 6 bar
- Accuracy: < 0.005 mm
- Dimensions: Ø 138 x 52 mm

C 280 120

Standard



C 280 170

with indexing option



Chuck HHP built-up with flange without mounting bores

For installation on a machine table.

Mounting bores must be made by customer.

- Clamping force: 15.000 N
- Holding force: 60.000 N
- Lift-off during unclamping: 2 mm
- Hydraulic pressure: 30 - 70 bar
- Air pressure: 6 bar
- Accuracy: < 0.005 mm
- Dimensions: Ø 189 x 52 mm

C 280 310

Standard



C 280 350

with indexing option



Chuck HHP built-up with flange with mounting bores

For installation on a machine table.

Please submit dimension diagram of the mounting bores.

- Clamping force: 15.000 N
- Holding force: 60.000 N
- Lift-off during unclamping: 2 mm
- Hydraulic pressure: 30 - 70 bar
- Air pressure: 6 bar
- Accuracy: < 0.005 mm
- Dimensions: Ø 189 x 52 mm

C 280 320

Standard



C 280 360

with indexing option



Delphin Base plates HHP

Base plate with 2 chucks HHP

For installation on a machine table.

- Material: steel, heat pre-treated and ground
- Hydraulic / air nipples are included in the price of the plate

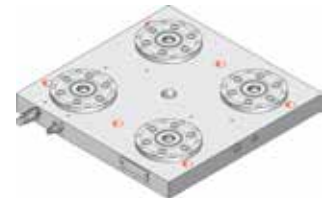
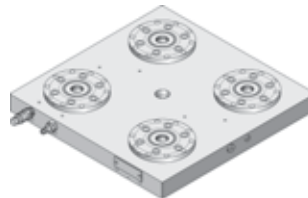


	Standard		with indexing option	
Centre distance	250	200	250	200
Without mounting bores	C 281 450	C 281 470	C 281 480	C 281 490
With mounting bores When ordering, please specify the machine table data	C 284 450	C 284 470	C 284 480	C 284 490
Dimensions:	198x55x448 mm	198x55x398 mm	198x55x448 mm	198x55x398 mm

Base plate with 4 chucks HHP

For installation on a machine table.

- Material: steel, heat pre-treated and ground
- Hydraulic / air nipples are included in the price of the plate



	Standard		with indexing option	
Centre distance	250	200	250	200
Without mounting bores	C 281 500	C 281 520	C 281 530	C 281 540
With mounting bores When ordering, please specify the machine table data	C 284 500	C 284 520	C 284 530	C 284 540
Dimensions:	448x55x448 mm	398x55x398 mm	448x55x448 mm	398x55x398 mm

Base plate with 6 chucks HHP

For installation on a machine table.

- Material: steel, heat pre-treated and ground
- Hydraulic / air nipples are included in the price of the plate



	Standard		with indexing option	
Centre distance	250	200	250	200
Without mounting bores	C 281 550	C 281 570	C 281 580	C 281 590
With mounting bores When ordering, please specify the machine table data	C 284 550	C 284 570	C 284 580	C 284 590
Dimensions:	698x55x448 mm	598x55x398 mm	698x55x448 mm	598x55x398 mm

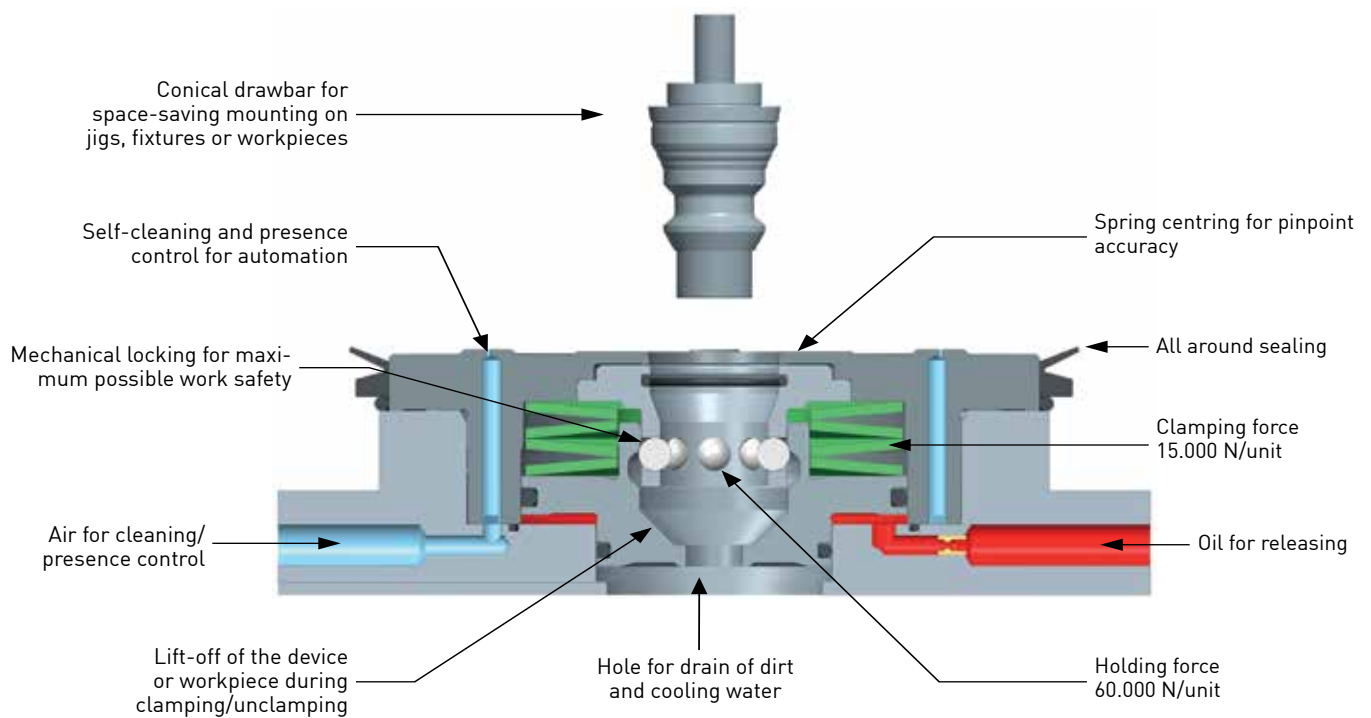
Delphin – Chuck HHPA

Hydraulic High Performance

Your advantages

- ✓ Combination of positioning cone and spring-loaded centring for maximum accuracy
- ✓ Low-wear and precise in the long term
- ✓ Lift-off function for protection of the Z-support of the chuck when loading heavy devices
- ✓ For automation
- ✓ Suitable for milling and measuring machines
- ✓ Simple drawbar mounting

The hydraulic system for automation



Specifications

- Repeat accuracy < 0.005 mm
- Mechanical clamping by spring force
- Hydraulic pressure to release 30 to 70 bar
- Lift-off of the devices during releasing
- Material chuck: stainless steel, hardened and ground
- Material flange: stainless steel, heat pre-treated



Delphin drawbars
Centring in 2 axes / 1 axis / without centring

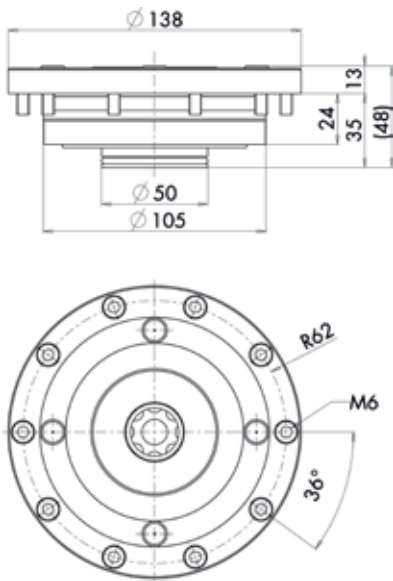
Product overview HHPA

	Item number	Page		
Chucks				
Built-in HHPA	C283 000	30		
Built-up HHPA without mounting bores	C283 310	30		
Built-up HHPA with mounting bores	C283 320	30		
Base plates				
	centre distance [mm]			
		with seal frame		
		with seal rings		
Base plate with 2 chucks HHPA	250	C284 650	C284 680	30
Base plate with 2 chucks HHPA	200	C284 670	C284 690	30
Base plate with 4 chucks HHPA	250	C284 700	C284 730	30
Base plate with 4 chucks HHPA	200	C284 720	C284 740	30
Seal frames for base plates				
	centre distance [mm]			
Seal frames with 2 chucks	250	C284 610		30
Seal frames with 2 chucks	200	C284 660		30
Seal frames with 4 chucks	250	C284 710		30
Seal frames with 4 chucks	200	C284 760		30
Cover plates				
Cover plate type A		C287 300		56
Cover plate type B		C287 310		56
Cover plate type C		C287 320		56
Control units				
Hydraulic pump hybrid with control box (manual)		C287 150		49
Hydraulic pump hybrid without control box (automation)		C287 160		49
Hand pump		C287 120		49
Connection block HHPA (including fittings)		C286 030		50
Connection equipment without cover plate				
Connections for 2 chucks		S816 000		51
Connections for 4 chucks		S816 100		51
Connection equipment with cover plate				
Connections for 2 chucks		S816 200		51
Connections for 4 chucks		S816 300		51
Drawbar fixing from the bottom				
Set for 2 chucks or base plate with 2 chucks		S812 000		47
Set for 4 chucks or base plate with 4 chucks		S812 100		47
Set for 6 chucks or base plate with 6 chucks		S812 200		47
Drawbar fixing from top				
Set for 2 chucks or base plate with 2 chucks		S812 010		48
Set for 4 chucks or base plate with 4 chucks		S812 110		48
Set for 6 chucks or base plate with 6 chucks		S812 210		48
Automation pallets				
Pallets for 4 chucks, centre distance 250 mm		C282 710 / C282 740		57
Pallets for 4 chucks, centre distance 200 mm		C282 730 / C282 750		57
Protective pallet HHPA		C286 040		53
Miscellaneous				
Pre-centring spigot / pre-centring bush		C286 160 / C286 250		54
Locking spigot		C286 060		53
Protection support drawbar		C286 050		53
Z-Support		C286 210		52
Set accessories fixation M8 / M10 / M12		C289 100 / C289 110 / C289 120		55
Spare parts for chuck HHPA		S840 060		60

Installation and mounting dimensions HHPA

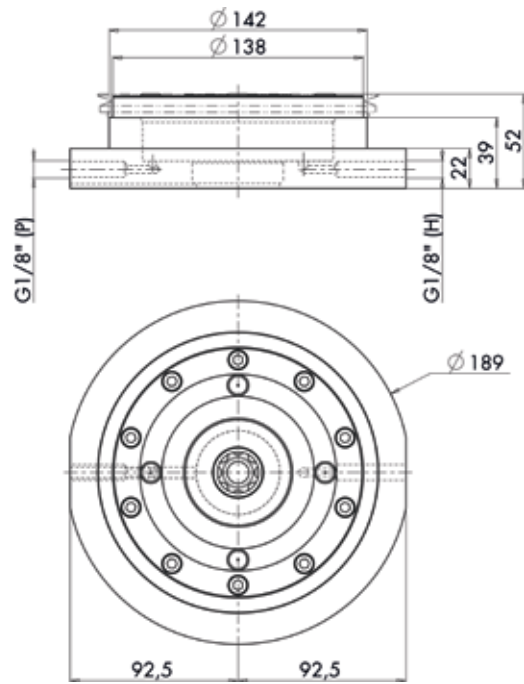
Chuck HHPA built-in

(in machine table or base plate)



Chuck HHPA built-up

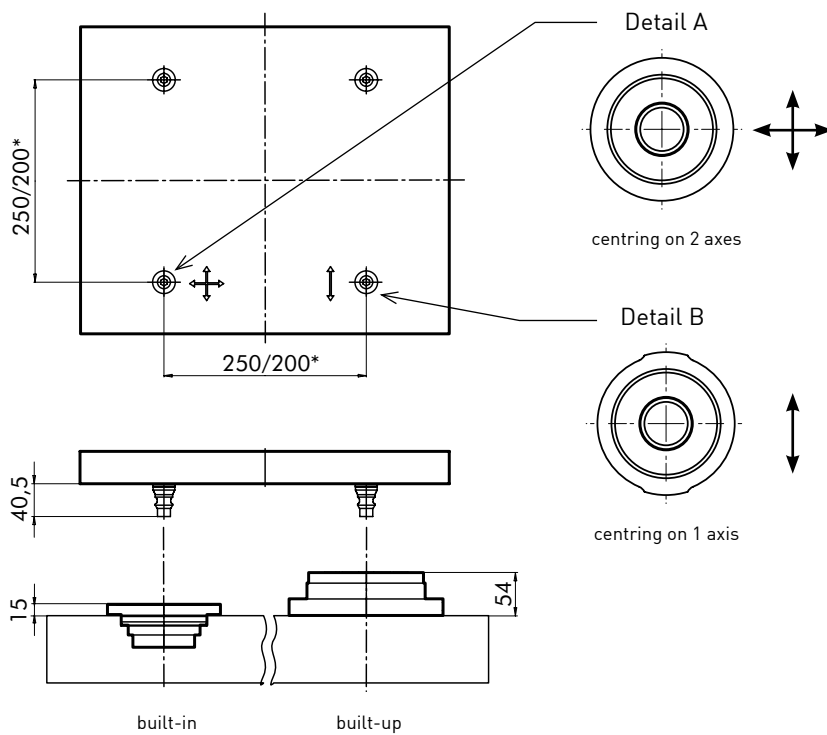
(on machine table)



H= Hydraulic
P= Pneumatic

Plate with Delphin drawbars

(example)



* recommended centre distance

Delphin HHPA

Chuck HHPA built-in C 283 000

For simple installation in the machine table or in a base plate.

Note: use the chuck with seal ring (C 286 090) or seal frame.

- Clamping force: 15.000 N
- Holding force: 60.000 N
- Lift-off during unclamping: 2 mm
- Hydraulic pressure: 30 - 70 bar
- Air pressure: 6 bar
- Accuracy: < 0.005 mm
- Dimensions: Ø 138 x 48 mm



Chuck HHPA built-up with flange without mounting bores

C 283 310

For installation on a machine table.

Mounting bores must be made by customer.

- Clamping force: 15.000 N
- Holding force: 60.000 N
- Lift-off during unclamping: 2 mm
- Hydraulic pressure: 30 - 70 bar
- Air pressure: 6 bar
- Accuracy: < 0.005 mm
- Dimensions: Ø 189 x 52 mm



Chuck HHPA built-up with flange with mounting bores

C 283 320

For installation on a machine table.

Please submit dimension diagram of the mounting bores.

- Clamping force: 15.000 N
- Holding force: 60.000 N
- Lift-off during unclamping: 2 mm
- Hydraulic pressure: 30 - 70 bar
- Air pressure: 6 bar
- Accuracy: < 0.005 mm
- Dimensions: Ø 189 x 52 mm



Base plate with 2 chucks HHPA

- Material: steel, heat pre-treated and ground
- Hydraulic / air nipples are included in the price of the plate
- With mounting bores
(when ordering, please specify the machine table data)



Centre distance	250	200
With seal frame	C 284 650	C 284 670
With seal rings	C 284 680	C 284 690
Dimensions [mm]:	168x55x408	168x55x358

Base plate with 4 chucks HHPA

- Material: steel, heat pre-treated and ground
- Hydraulic / air nipples are included in the price of the plate
- With mounting bores
(when ordering, please specify the machine table data)



Centre distance	250	200
With seal frame	C 284 700	C 284 720
With seal rings	C 284 730	C 284 740
Dimensions [mm]:	408x55x408	358x55x358

Seal frame for base plate HHP/ HHPA

- Material: aluminium



Centre distance	250	200
Seal frame for 2 chucks	C 284 610	C 284 660
Dimensionen [mm]:	168x13x408	168x13x358
Seal frame for 4 chucks	C 284 710	C 284 760
Dimensions [mm]:	408x13x408	358x13x358

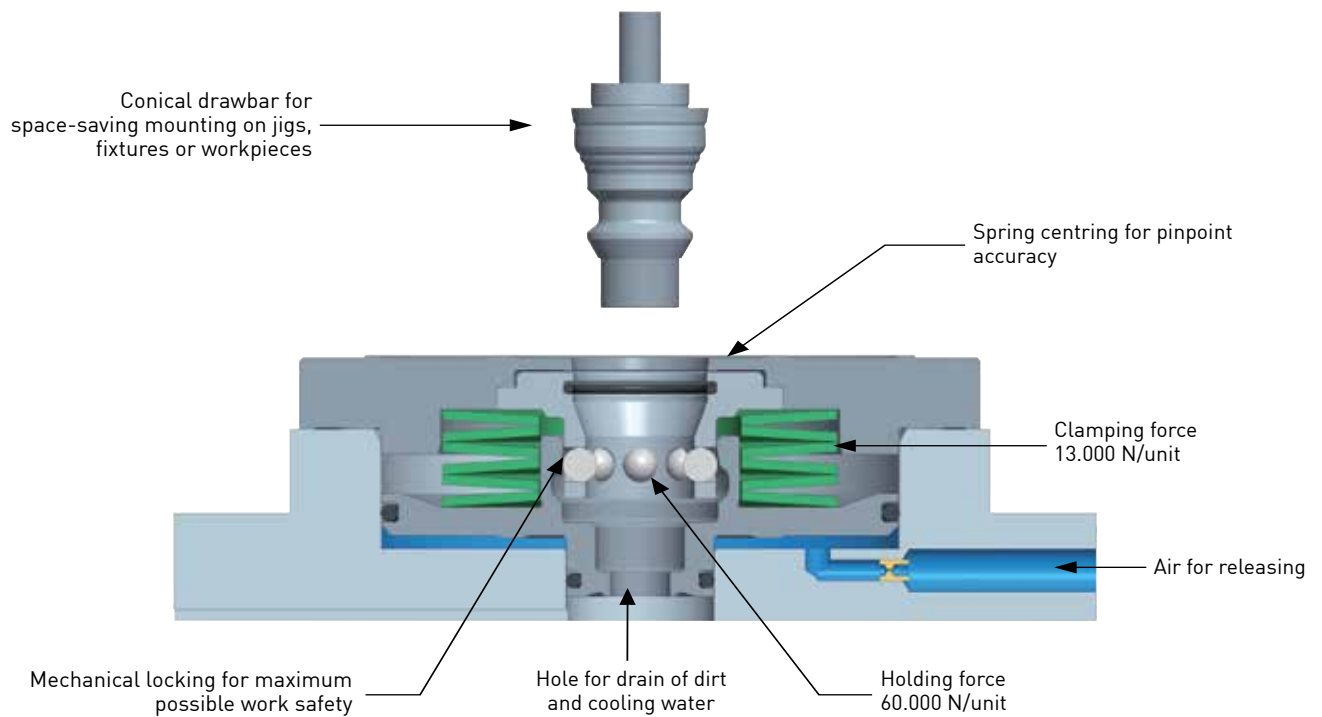
Delphin – Chuck PSP

Pneumatic Standard Performance

The pneumatic system for manual equipping

Your advantages

- ✓ Combination of positioning cone and spring-loaded centring for maximum accuracy
- ✓ Low-wear and precise in the long term
- ✓ For manual equipping
- ✓ Suitable for milling, grinder, die-sinking EDM and measuring machines
- ✓ Simple drawbar mounting
- ✓ All-around Z-support ring for protecting the clamping spigot bore against dirt



Specifications

- Repeat accuracy < 0.005 mm
- Mechanical clamping by spring force
- Pneumatic pressure to release 6 bar
- Material chuck: stainless steel, hardened and ground
- Material flange: stainless steel, heat pre-treated



Delphin drawbars
Centring in 2 axes / 1 axis / without centring

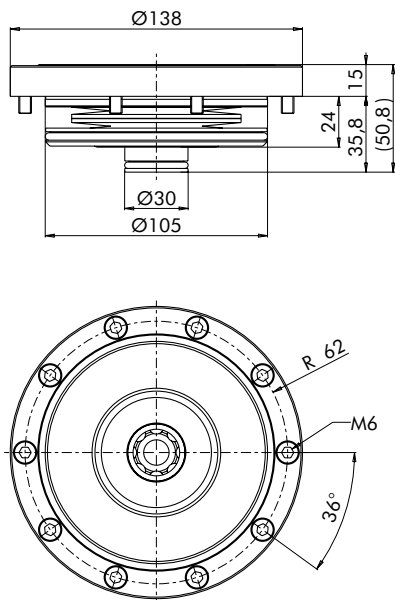
Product overview PSP

	Item number		Page	
	without mounting bores	with mounting bores		
Chucks				
Built-in PSP	C240 000		34	
Semi built-in PSP (with thread)	C240 120		34	
Built-up PSP	C240 310	C240 320	34	
Base plates				
	centre distance [mm]			
Base plate with 2 chucks PSP	250	C240 450	C244 450	35
Base plate with 2 chucks PSP	200	C240 470	C244 470	35
Base plate with 4 chucks PSP	250	C240 500	C244 500	35
Base plate with 4 chucks PSP	200	C240 520	C244 520	35
Base plate with 6 chucks PSP	250	C240 550	C244 550	35
Base plate with 6 chucks PSP	200	C240 570	C244 570	35
Base plate Take 4 PSP	250 -	-	C242 400	36
Base plate Take 6 PSP	250 -	-	C242 600	36
Cover plates				
Cover plate type A		C287 300		56
Cover plate type B		C287 310		56
Cover plate type C		C287 320		56
Control units				
Pneumatic control unit manual		C810 720		49
Connection block PSP (including fittings)				
		C296 010		50
Connection equipment without cover plate				
Connections for 2 chucks		S816 600		51
Connections for 4 chucks		S816 700		51
Connection equipment with cover plate				
Connections for 2 chucks		S817 000		51
Connections for 4 chucks		S817 100		51
Drawbar fixing from the bottom				
Set for 2 chucks or base plate with 2 chucks		S812 000		47
Set for 4 chucks or base plate with 4 chucks		S812 100		47
Set for 6 chucks or base plate with 6 chucks		S812 200		47
Drawbar fixing from top				
Set for 2 chucks or base plate with 2 chucks		S812 010		48
Set for 4 chucks or base plate with 4 chucks		S812 110		48
Set for 6 chucks or base plate with 6 chucks		S812 210		48
Protective pallet PSP				
		C286 040		53
Miscellaneous				
Pre-centring spigot / pre-centring bush		C286 160 / C286 250		54
Locking spigot		C286 060		53
Protection support drawbar		C286 050		53
Z support		C286 200		52
Set accessories fixation M8 / M10 / M12				
		C289 100 / C289 110 / C289 120		51
Accessories fixation / Seal Take 4 / Take 6				
Set accessories fixation Take 4 / Take 6		C289 198 / C289 190		55
Seal set for slotted holes Take 4 / Take 6		S820 040 / S820 060		55
Spare parts for chuck PSP				
		S840 030		60

Installation and mounting dimensions PSP

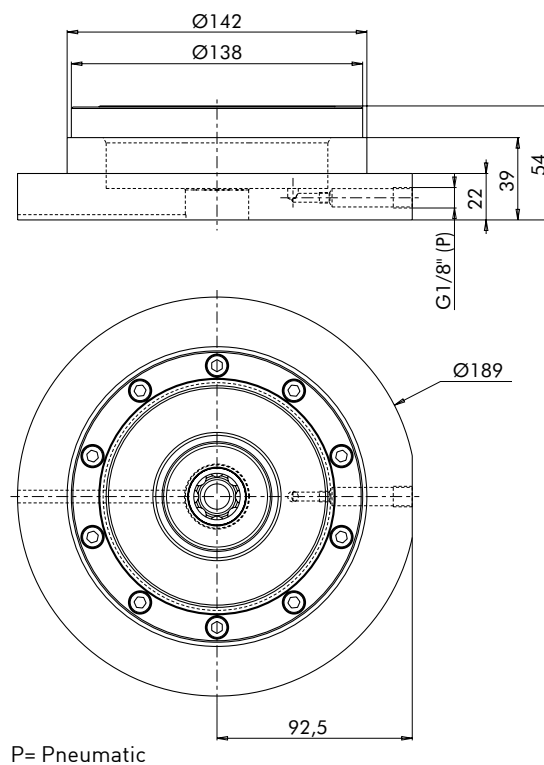
Chuck PSP built-in

(on machine table or base plate)



Chuck PSP built-up

(on machine table)



P= Pneumatic

Chuck PSP semi built-in

(in clamping turret)

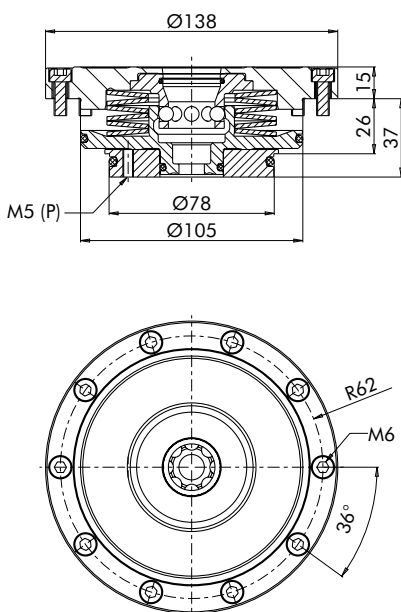
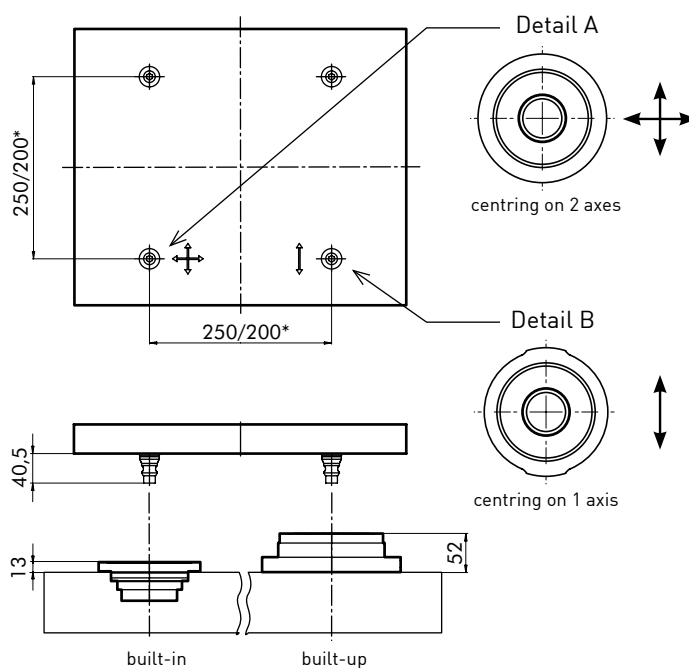


Plate with Delphin drawbars

(example)



* recommended centre distance

Delphin Chucks PSP

Chuck PSP built-in

C 240 000

For simple installation in the machine table or in a base plate.

- Clamping force: 13.000 N
- Holding force: 60.000 N
- Air pressure: 6 bar
- Accuracy: < 0.005 mm
- Dimensions: Ø 138 x 51 mm



Chuck PSP semi built-in (with thread)

C 240 120

For simple installation in a clamping turret (cube or bracket).

- Clamping force: 13.000 N
- Holding force: 60.000 N
- Air pressure: 6 bar
- Accuracy: < 0.005 mm
- Dimensions: Ø 138 x 52 mm



Chuck PSP built-up with flange without mounting bores

C 240 310

For installation on a machine table.

Mounting bores must be made by customer.

- Clamping force: 13.000 N
- Holding force: 60.000 N
- Air pressure: 6 bar
- Accuracy: < 0.005 mm
- Dimensions: Ø 189 x 54 mm



Chuck PSP built-up with flange with mounting bores

C 240 320

For installation on a machine table.

Please submit dimension diagram of the mounting bores.

- Clamping force: 13.000 N
- Holding force: 60.000 N
- Air pressure: 6 bar
- Accuracy: < 0.005 mm
- Dimensions: Ø 189 x 54 mm

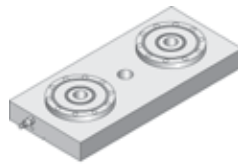


Delphin Base plates PSP

Base plate with 2 chucks PSP

For installation on a machine table.

- Material: steel, heat pre-treated and ground
- Air nipples are included in the price of the plate

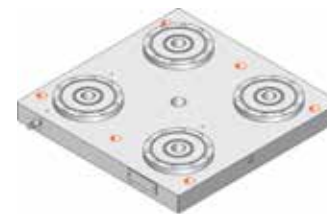
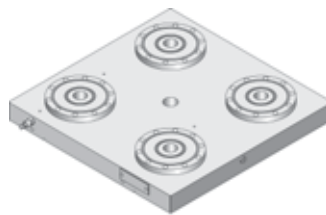


Centre distance	250	200
Without mounting bores	C 240 450	C 240 470
With mounting bores	C 244 450	C 244 470
When ordering, please specify the machine table data		
Dimensions:	198x57x448 mm	198x57x398 mm

Base plate with 4 chucks PSP

For installation on a machine table.

- Material: steel, heat pre-treated and ground
- Air nipples are included in the price of the plate

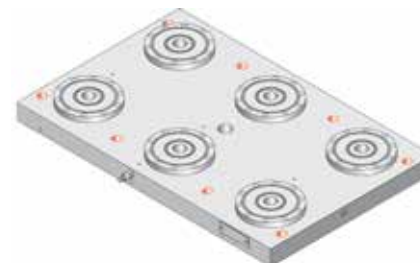
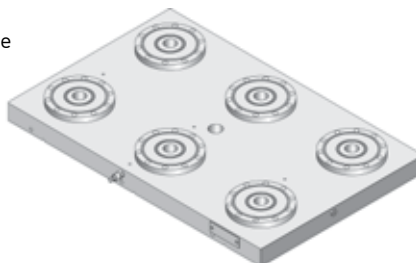


Centre distance	250	200
Without mounting bores	C 240 500	C 240 520
With mounting bores	C 244 500	C 244 520
When ordering, please specify the machine table data		
Dimensions:	448x57x448 mm	398x57x398 mm

Base plate with 6 chucks PSP

For installation on a machine table.

- Material: steel, heat pre-treated and ground
- Air nipples are included in the price of the plate



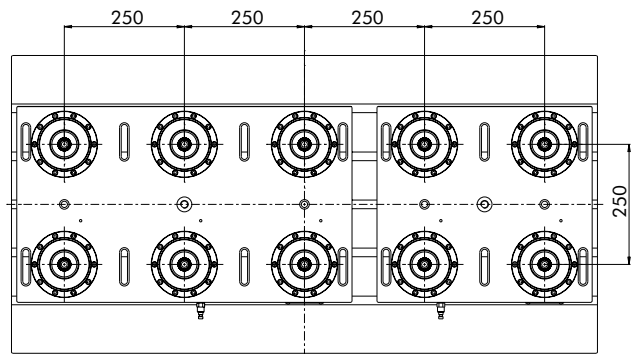
Centre distance	250	200
Without mounting bores	C 240 550	C 240 570
With mounting bores	C 244 550	C 244 570
When ordering, please specify the machine table data		
Dimensions:	698x57x448 mm	598x57x398 mm

Delphin – Take Baseplates

Delphin baseplates Take 4 / Take 6 with pneumatic chucks PSP

The universal pneumatic baseplates suit every machine and they are very easy to set up.

- Defined hole pattern with slotted holes suitable for all current machines
- Material: steel, heat pre-treated and ground
- Central bore and milled edge for quick positioning

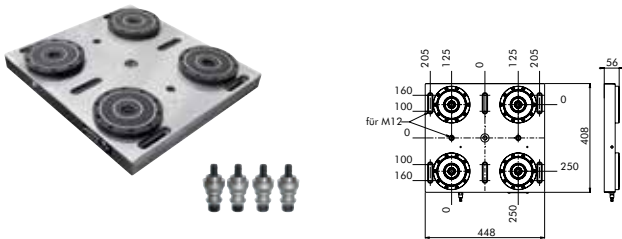


Accessories for Take 4 / Take 6 see „Accessories“

Delphin baseplates Take 4 C 242 400

For installation on a machine table.

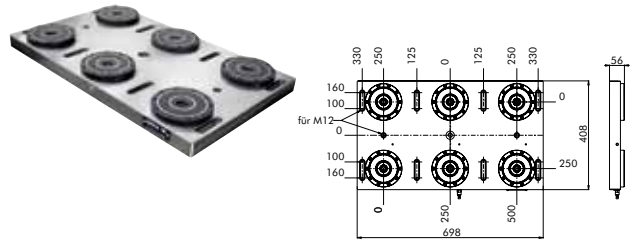
- Baseplate with 4 chucks PSP
- Centre distance 250 mm
- Air pressure: 6 bar
- Accuracy: < 0.005 mm
- Dimensions: 448x408x56 mm
- Including drawbar set S812100



Delphin baseplates Take 6 C 242 600

For installation on a machine table.

- Baseplate with 6 chucks PSP
- Centre distance 250 mm
- Air pressure: 6 bar
- Accuracy: < 0.005 mm
- Dimensions: 698x408x56 mm



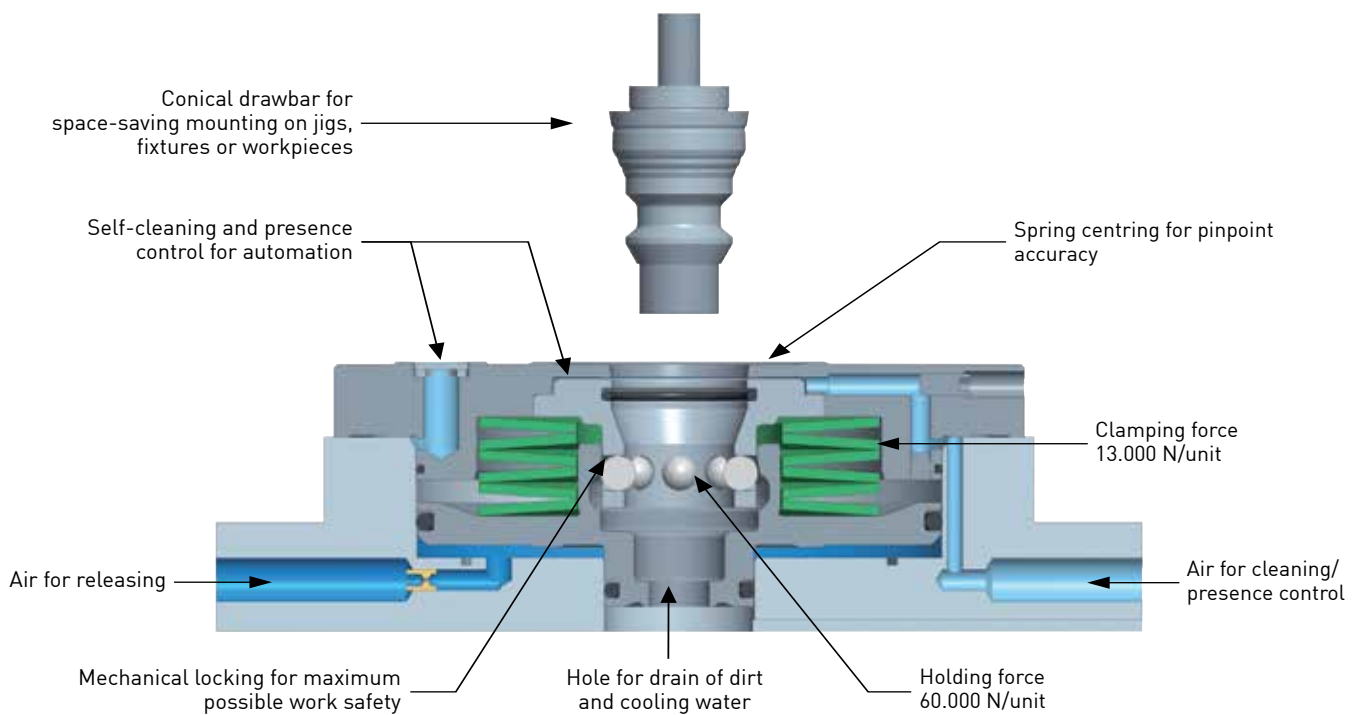
Delphin – Chuck PHP

Pneumatic High Performance

Your advantages

- ✓ Combination of positioning cone and spring-loaded centring for maximum accuracy
- ✓ Low-wear and precise in the long term
- ✓ For manual and automated equipping
- ✓ Suitable for milling, grinder, die-sinking EDM and measuring machines
- ✓ Simple drawbar mounting
- ✓ All-around Z-support ring for protecting the clamping spigot bore against dirt

The pneumatic system for manual and automated equipping



Specifications

- Repeat accuracy < 0.005 mm
- Mechanical clamping by spring force
- Pneumatic pressure to release 6 bar
- Material chuck: stainless steel, hardened and ground
- Material flange: stainless steel, heat pre-treated



Delphin drawbars
Centring in 2 axes / 1 axis / without centring

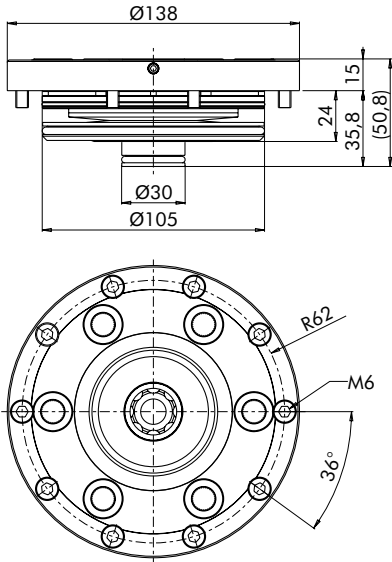
Product overview PHP

	Item number		Item number		Page	
	Mounting bores	Standard		Indexing		
		without	with	without		with
Chucks						
Built-in PHP		C290 000		C290 050	40	
Semi built-in PHP (with thread)		C290 120		C290 170	40	
Built-up PHP		C290 310	C290 320	C290 350	C290 360	40
Base plates						
	centre distance [mm]					
Base plate with 2 chucks PHP	250	C291 450	C294 450	C291 480	C294 480	41
Base plate with 2 chucks PHP	200	C291 470	C294 470	C291 490	C294 490	41
Base plate with 4 chucks PHP	250	C291 500	C294 500	C291 530	C294 530	41
Base plate with 4 chucks PHP	200	C291 520	C294 520	C291 540	C294 540	41
Base plate with 6 chucks PHP	250	C291 550	C294 550	C291 580	C294 580	41
Base plate with 6 chucks PHP	200	C291 570	C294 570	C291 590	C294 590	41
Cover plates						
Cover plate type A		C287 300				56
Cover plate type B		C287 310				56
Cover plate type C		C287 320				56
Control units						
Pneumatic control unit		C296 000				49
Pneumatic control unit manual		C810 720				49
Connection block PHP (including fittings)						
		C296 030				50
Connection equipment without cover plate						
Connections for 2 chucks		S816 000				51
Connections for 4 chucks		S816 100				51
Connection equipment with cover plate						
Connections for 2 chucks		S816 400				51
Connections for 4 chucks		S816 500				51
Drawbar fixing from the bottom						
Set for 2 chucks or base plate with 2 chucks		S812 000				47
Set for 4 chucks or base plate with 4 chucks		S812 100				47
Set for 6 chucks or base plate with 6 chucks		S812 200				47
Drawbar fixing from top						
Set for 2 chucks or base plate with 2 chucks		S812 010				48
Set for 4 chucks or base plate with 4 chucks		S812 110				48
Set for 6 chucks or base plate with 6 chucks		S812 210				48
Automation pallets						
Pallets for 4 chucks, centre distance 250 mm		C282 710 / C282 740				57
Pallets for 4 chucks, centre distance 200 mm		C282 730 / C282 750				57
Protective pallet PHP						
		C286 040				53
Miscellaneous						
Pre-centring spigot / pre-centring bush		C286 160 / C286 250				54
Locking spigot		C286 060				53
Protection support drawbar		C286 050				53
Z support		C286 200				52
Indexing pins ground				S814 000		52
Mounting device for indexing pins				C286 080		52
Set accessories fixation M8 / M10 / M12						
		C289 100 / C289 110 / C289 120				55
Spare parts for chuck PHP						
		S840 020				60

Installation and mounting dimensions PHP

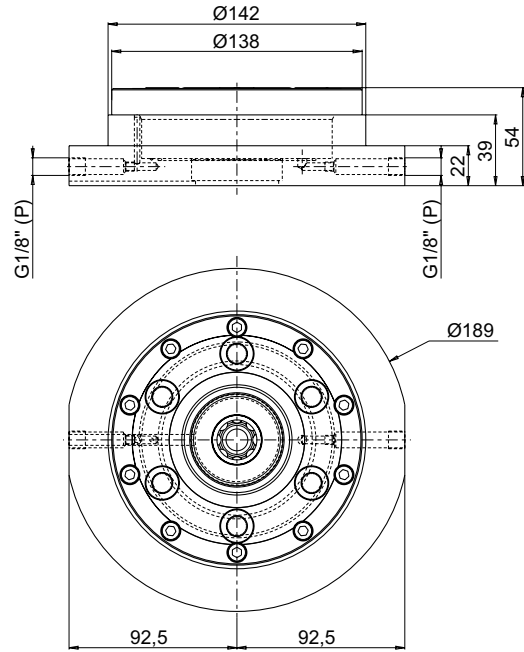
Chuck PHP built-in

(in machine table or base plate)



Chuck PHP built-up

(on machine table)



P= Pneumatic

Chuck PHP semi built-in

(in clamping turret)

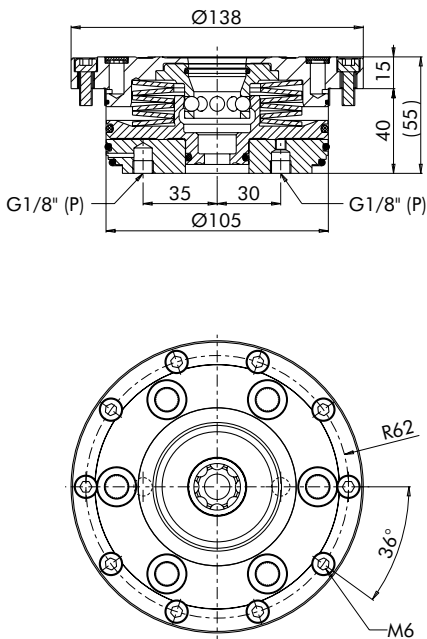
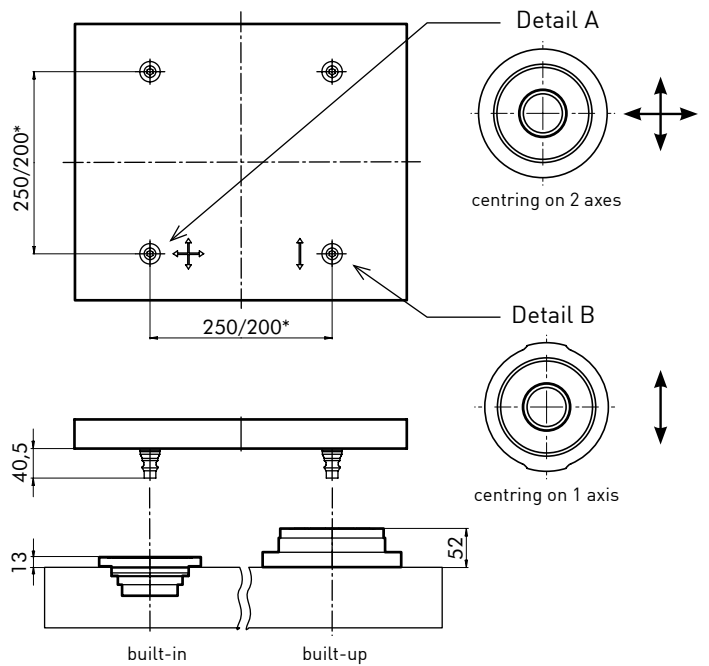


Plate with Delphin drawbars

(example)



* recommended centre distance

Delphin Chucks PHP

Chuck PHP built-in

For simple installation in the machine table or in a base plate.

- Clamping force: 13.000 N
- Holding force: 60.000 N
- Air pressure: 6 bar
- Accuracy: < 0.005 mm
- Dimensions: Ø 138 x 51 mm

C 290 000

Standard

C 290 050

with indexing option



Chuck PHP semi built-in (with thread)

For simple installation in a clamping turret (cube or bracket).

- Clamping force: 13.000 N
- Holding force: 60.000 N
- Air pressure: 6 bar
- Accuracy: < 0.005 mm
- Dimensions: Ø 138 x 55 mm

C 290 120

Standard

C 290 170

with indexing option



Chuck PHP built-up with flange without mounting bores

For installation on a machine table.

Mounting bores must be made by customer.

- Clamping force: 13.000 N
- Holding force: 60.000 N
- Air pressure: 6 bar
- Accuracy: < 0.005 mm
- Dimensions: Ø 189 x 54 mm

C 290 310

Standard

C 290 350

with indexing option



Chuck PHP built-up with flange with mounting bores

For installation on a machine table.

Please submit dimension diagram of the mounting bores.

- Clamping force: 13.000 N
- Holding force: 60.000 N
- Air pressure: 6 bar
- Accuracy: < 0.005 mm
- Dimensions: Ø 189 x 54 mm

C 290 320

Standard

C 290 360

with indexing option



Delphin Base plates PHP

Base plate with 2 chucks PHP

For installation on a machine table.

- Material: steel, heat pre-treated and ground
- Air nipples are included in the price of the plate

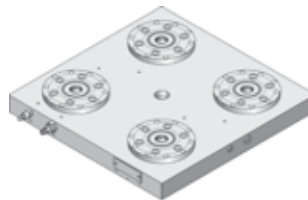


	Standard		with indexing option	
Centre distance	250	200	250	200
Without mounting bores	C 291 450	C 291 470	C 291 480	C 291 490
With mounting bores When ordering, please specify the machine table data	C 294 450	C 294 470	C 294 480	C 294 490
Dimensions:	198x57x448 mm	198x57x398 mm	198x57x448 mm	198x57x398 mm

Base plate with 4 chucks PHP

For installation on a machine table.

- Material: steel, heat pre-treated and ground
- Air nipples are included in the price of the plate



	Standard		with indexing option	
Centre distance	250	200	250	200
Without mounting bores	C 291 500	C 291 520	C 291 530	C 291 540
With mounting bores When ordering, please specify the machine table data	C 294 500	C 294 520	C 294 530	C 294 540
Dimensions:	448x57x448 mm	398x57x398 mm	448x57x448 mm	398x57x398 mm

Base plate with 6 chucks PHP

For installation on a machine table.

- Material: steel, heat pre-treated and ground
- Air nipples are included in the price of the plate



	Standard		with indexing option	
Centre distance	250	200	250	200
Without mounting bores	C 291 550	C 291 570	C 291 580	C 291 590
With mounting bores When ordering, please specify the machine table data	C 294 550	C 294 570	C 294 580	C 294 590
Dimensions:	698x57x448 mm	598x57x398 mm	698x57x448 mm	598x57x398 mm

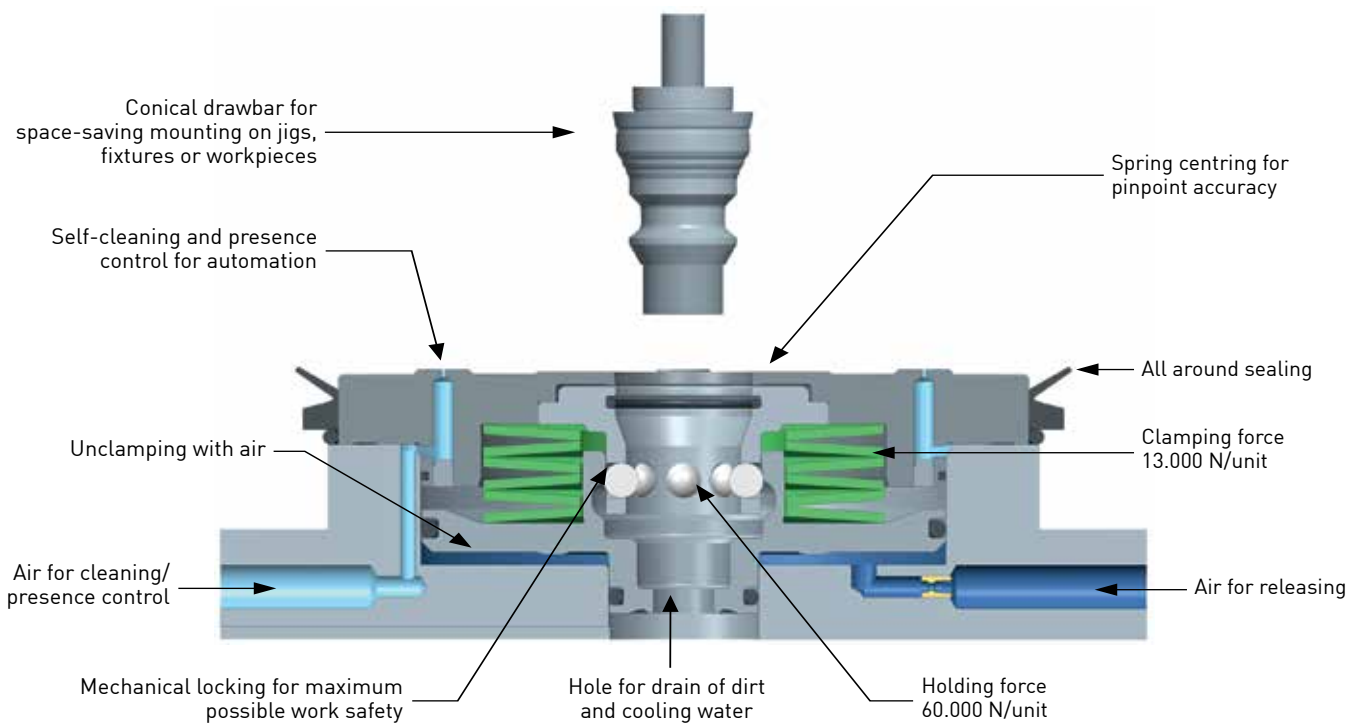
Delphin – Chuck PHPA

Pneumatic High Performance Automation

The pneumatic system
for automation

Your advantages

- ✓ Combination of positioning cone and spring-loaded centring for maximum accuracy
- ✓ Low-wear and precise in the long term
- ✓ For automation
- ✓ Suitable for milling, grinder, die-sinking EDM and measuring machines
- ✓ Simple drawbar mounting



Specifications

- Repeat accuracy < 0.005 mm
- Mechanical clamping by spring force
- Pneumatic pressure to release 6 bar
- Material chuck: stainless steel, hardened and ground
- Material flange: stainless steel, heat pre-treated



Delphin drawbars
Centring in 2 axes / 1 axis / without centring

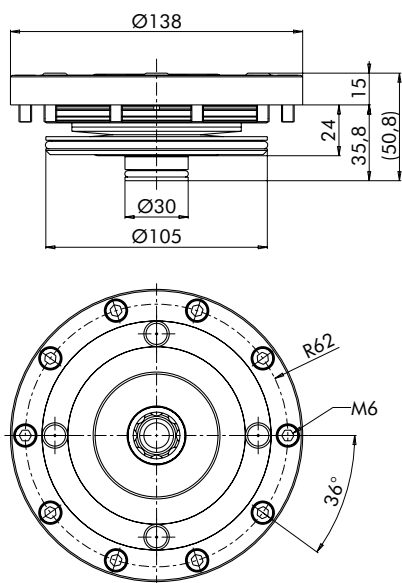
Product overview PHPA

		Item number	Page
Chucks			
Built-in PHPA		C293 000	45
Built-up PHPA without mounting bores		C293 310	45
Built-up PHPA with mounting bores		C293 320	45
Base plates			
	centre distance [mm]	with seal frame	with seal rings
Base plate with 2 chucks PHPA	250	C294 650	C294 680
Base plate with 2 chucks PHPA	200	C294 670	C294 690
Base plate with 4 chucks PHPA	250	C294 700	C294 730
Base plate with 4 chucks PHPA	200	C294 720	C294 740
Seal frames for base plates			
	centre distance [mm]		
Seal frames with 2 chucks	250	C294 610	45
Seal frames with 2 chucks	200	C294 660	45
Seal frames with 4 chucks	250	C294 710	45
Seal frames with 4 chucks	200	C294 760	45
Cover plates			
Cover plate type A		C287 300	56
Cover plate type B		C287 310	56
Cover plate type C		C287 320	56
Control units			
Pneumatic control unit		C296 000	49
Pneumatic control unit manual		C810 720	49
Connection block PHPA (including fittings)			
		C296 030	50
Connection equipment without cover plate			
Connections for 2 chucks		S816 000	51
Connections for 4 chucks		S816 100	51
Connection equipment with cover plate			
Connections for 2 chucks		S816 400	51
Connections for 4 chucks		S816 500	51
Drawbar fixing from the bottom			
Set for 2 chucks or base plate with 2 chucks		S812 000	47
Set for 4 chucks or base plate with 4 chucks		S812 100	47
Set for 6 chucks or base plate with 6 chucks		S812 200	47
Drawbar fixing from top			
Set for 2 chucks or base plate with 2 chucks		S812 010	48
Set for 4 chucks or base plate with 4 chucks		S812 110	48
Set for 6 chucks or base plate with 6 chucks		S812 210	48
Automation pallets			
Pallets for 4 chucks, centre distance 250 mm		C282 710 / C282 740	57
Pallets for 4 chucks, centre distance 200 mm		C282 730 / C282 750	57
Protective pallet PHPA			
		C286 040	53
Miscellaneous			
Pre-centring spigot / pre-centring bush		C286 160 / C286 250	54
Locking spigot		C286 060	53
Protection support drawbar		C286 050	53
Z support		C286 200	52
Set accessories fixation M8 / M10 / M12			
		C289 100 / C289 110 / C289 120	55
Spare parts for chuck PHPA			
		S840 050	61

Installation and mounting dimensions PHPA

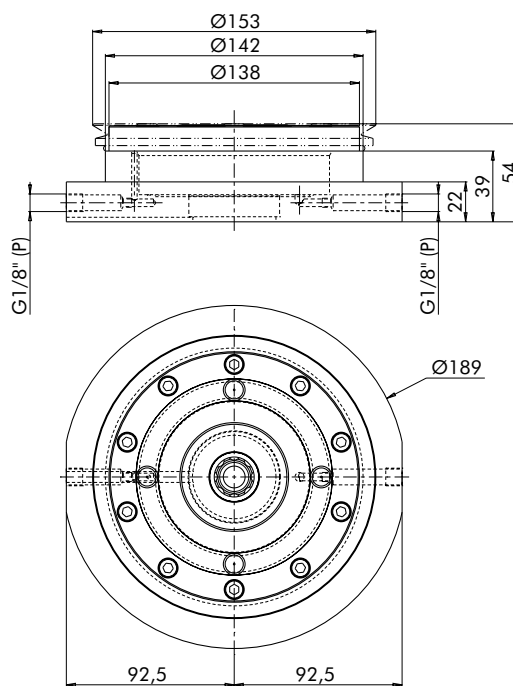
Chuck PHPA built-in

(in machine table or base plate)



Chuck PHPA built-up

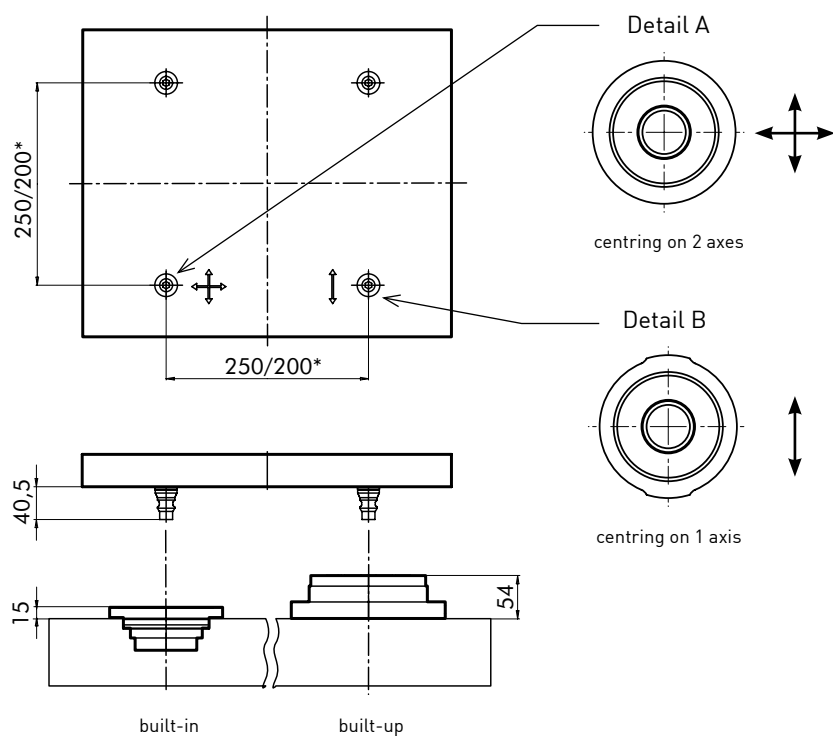
(on machine table)



P= Pneumatic

Plate with Delphin drawbars

(example)



* recommended centre distance

Delphin PHPA

Chuck PHPA built-in C 293 000

For simple installation in the machine table or in a base plate.

Note: use the chuck with seal ring (C 286 090) or seal frame.

- Clamping force: 13.000 N
- Holding force: 60.000 N
- Air pressure: 6 bar
- Accuracy: < 0.005 mm
- Dimensions: Ø 138 x 51 mm



Chuck PHPA built-up with flange without mounting bores

C 293 310

For installation on a machine table.

Mounting bores must be made by customer.

- Clamping force: 13.000 N
- Holding force: 60.000 N
- Air pressure: 6 bar
- Accuracy: < 0.005 mm
- Dimensions: Ø 189 x 54 mm



Chuck PHPA built-up with flange with mounting bores

C 293 320

For installation on a machine table.

Please submit dimension diagram of the mounting bores.

- Clamping force: 13.000 N
- Holding force: 60.000 N
- Air pressure: 6 bar
- Accuracy: < 0.005 mm
- Dimensions: Ø 189 x 54 mm



Base plate with 2 chucks PHPA

- Material: steel, heat pre-treated and ground
- Air nipples are included in the price of the plate
- With mounting bores
(When ordering, please specify the machine table data)



Centre distance	250	200
With seal frame	C 294 650	C 294 670
With seal rings	C 294 680	C 294 690
Dimensions [mm]:	168x57x408	168x57x358

Base plate with 4 chucks PHPA

- Material: steel, heat pre-treated and ground
- Air nipples are included in the price of the plate
- With mounting bores
(When ordering, please specify the machine table data)



Centre distance	250	200
With seal frame	C 294 700	C 294 720
With seal rings	C 294 730	C 294 740
Dimensions [mm]:	408x57x408	358x57x358

Seal frame for base plate PHP/ PHPA

- Material: aluminium



Centre distance	250	200
Seal frame for 2 chucks	C 294 610	C 294 660
Dimensionen [mm]:	168x15x408	168x15x358
Seal frame for 4 chucks	C 294 710	C 294 760
Dimensions [mm]:	408x15x408	358x15x358

Delphin base plates in automation

Delphin PHPA

for pneumatic opening, suitable for all kinds of applications like milling, die-sinking EDM and grinding.

Delphin HHPA

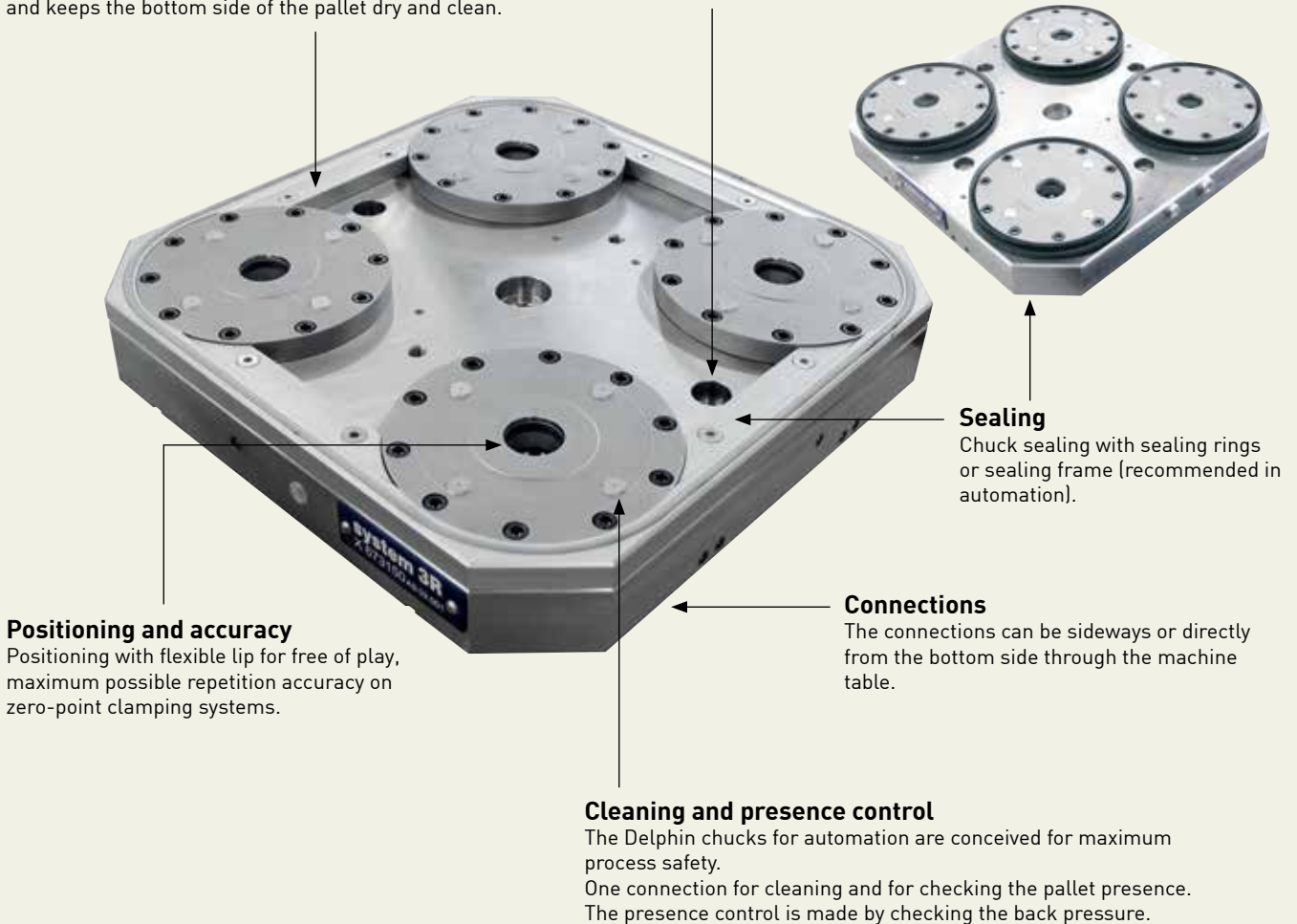
for hydraulic opening with lift-off and soft landing function, preferably for milling applications with heavy loads and high machining forces.

Sealing frame

The sealing frame protects the entire area between the base plate and the bottom side of the pallet against chips and fluids and keeps the bottom side of the pallet dry and clean.

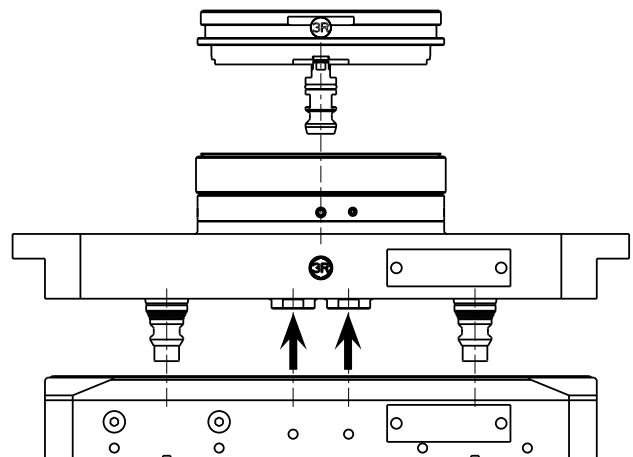
Fixation

Machine specific fixation hole pattern.



Using an additional system in automation

With medium connections to the pallet an additional system can be directly connected for an automated operation of multiple systems.



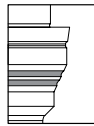
Drawbars Delphin – fixed in pallet

Drawbar — centring on 2 axes

C 282 000

Fixed in pallet

- Material: stainless steel, hardened and ground
- Dimensions, screwed in: $\varnothing 28 \times 40.5$ mm



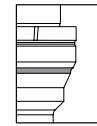
2 notches

Drawbar — centring on 1 axis

C 282 100

Fixed in pallet

- Material: stainless steel, hardened and ground
- Dimensions, screwed in: $\varnothing 28 \times 40.5$ mm



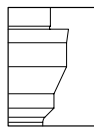
1 notch

Drawbar — without centring

C 282 200

Fixed in pallet

- Material: stainless steel, hardened and ground
- Dimensions, screwed in: $\varnothing 28 \times 40.5$ mm




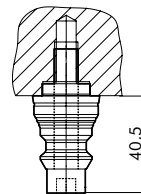
without notch

Function of the Delphin drawbar

 centring on 2 axes

 centring on 1 axis

 without centring



fixed in pallet

Drawbar - Sets

Set with 2 drawbars

S 812 000

- Scope of delivery:
 - 1 x C 282 000 (centring on 2 axes)
 - 1 x C 282 100 (centring on 1 axis)



Set with 4 drawbars

S 812 100

- Scope of delivery:
 - 1 x C 282 000 (centring on 2 axes)
 - 1 x C 282 100 (centring on 1 axis)
 - 2 x C 282 200 (without centring)



Set with 6 drawbars

S 812 200

- Scope of delivery:
 - 1 x C 282 000 (centring on 2 axes)
 - 1 x C 282 100 (centring on 1 axis)
 - 4 x C 282 200 (without centring)



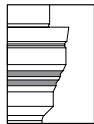
Drawbars Delphin - fixed through pallet

Drawbar — centring on 2 axes

C 282 020

Fixed through pallet

- Material: stainless steel, hardened and ground
- Dimensions screwed in: $\varnothing 28 \times 40.5$ mm



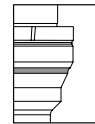
2 notches

Drawbar — centring on 1 axis

C 282 120

Fixed through pallet

- Material: stainless steel, hardened and ground
- Dimensions screwed in: $\varnothing 28 \times 40.5$ mm



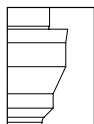
1 notch

Drawbar — without centring

C 282 220

Fixed through pallet

- Material: stainless steel, hardened and ground
- Dimensions screwed in: $\varnothing 28 \times 40.5$ mm




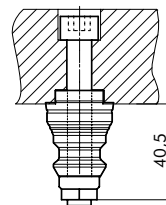
without notch

Function of the Delphin drawbar

 centring on 2 axes

 centring on 1 axis

 without centring



fixed through pallet

Drawbar - Sets

Set with 2 drawbars

S 812 010

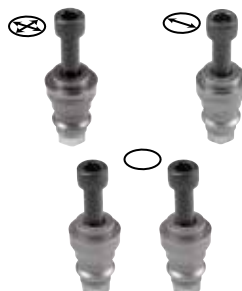
- Scope of delivery:
 - 1 x C 282 020 (centring on 2 axes)
 - 1 x C 282 120 (centring on 1 axis)



Set with 4 drawbars

S 812 110

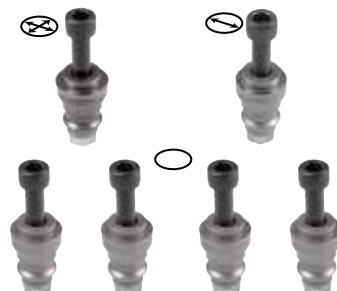
- Scope of delivery:
 - 1 x C 282 020 (centring on 2 axes)
 - 1 x C 282 120 (centring on 1 axis)
 - 2 x C 282 220 (without centring)



Set with 6 drawbars

S 812 210

- Scope of delivery:
 - 1 x C 282 020 (centring on 2 axes)
 - 1 x C 282 120 (centring on 1 axis)
 - 4 x C 282 220 (without centring)



Control systems Delphin

Hydraulic pump hybrid with control box for manual use

C 287 150

- Pressure: 50 bar max.
- Scope of delivery without hydraulic fluid



Hydraulic pump hybrid without control box for automation

C 287 160

For projects with automation solutions (e.g. System 3R Transformer).

- Pressure: 50 bar max.
- Scope of delivery without hydraulic fluid



Hydraulic fluid

We recommend the following hydraulic fluids

- Aral Vitam GF
- Castrol Hypsin ASW / Castrol Hypsin SP
- Mobil DTE 20 Series
- Mobil Hydraulic Oil
- Shell Tellus Oil Dea Astron HLP



Regulations in air traffic dictate that the hydraulic fluid must be procured locally.

Hand pump hydraulic

C 287 120

- Oil tank: 0.4 l
- Pressure: max. 50 bar
- Volume: 4.6 cm³
- Weight: 3.5 kg



Pneumatic control unit for PHP/ PHPA

C 296 000

With function for Z cleaning

- Air pressure: 8 bar max.
- Medium: dry, filtered compressed air in accordance with ISO 8573-1, class 3.4.3 or better



Pneumatic control unit for PSP

C 810 720

Without function for Z cleaning

- Air pressure: 8 bar max.
- Medium: dry, filtered compressed air in accordance with ISO 8573-1, class 3.4.3 or better



Control systems Delphin

Connection block HSP

C 286 100

- Material: Aluminium
- Dimensions: 40 x 39 x 50 mm
- Scope of delivery:
 - 1 connection block
 - 1 hydraulic connection



Connection block HHP/ HHPA

C 286 030

- Material: Aluminium
- Dimensions: 80x40x39 mm
- Scope of delivery:
 - 1 connection block
 - 4 hydraulic connections
 - 2 air connections
 - 1 mounting sheet (50x175x3 mm)



Connection block PSP

C 296 010

- Material: Aluminium
- Dimensions: 40 x 39 x 50 mm
- Scope of delivery:
 - 1 connection block
 - 1 air connection
 - 1 quick coupling



Connection block PHP/ PHPA

C 296 030

- Material: Aluminium
- Dimensions: 80x40x39 mm
- Scope of delivery:
 - 1 connection block
 - 6 air connections
 - 2 quick couplings
 - 1 mounting sheet (50x175x3 mm)



Connection equipment Delphin

Connection equipment for chucks



without cover plates

for 2 chucks

for 4 chucks



only in combination with a cover plate

for 2 chucks

for 4 chucks

Option
Connection block
(see page 42)

	for 2 chucks	for 4 chucks	for 2 chucks	for 4 chucks	
HSP	S 816 600	S 816 700	S 816 600	S 816 700	C 286 100
HHP	S 816 000	S 816 100	S 816 200	S 816 300	C 286 030
PSP	S 816 600	S 816 700	S 817 000	S 817 100	C 296 010
PHP/PHPA	S 816 000	S 816 100	S 816 400	S 816 500	C 296 030

Scope of delivery:
hydraulic / air pipes and fittings in steel

Application
Connection equipment for use without cover plate.

Example order for 6 chucks:
1x S 816 600 and 1x S 816 700

Scope of delivery HHP/HHPA:
hydraulic pipe and air hose and fittings
Scope of delivery PSP/PHP/PHPA:
air hose and fittings

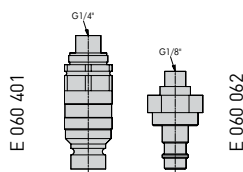
Application
Please use only in combination with a cover plate.
Extremely easy installation possible even in very confined space.

Example order for 6 chucks:
1x S 816 200 and 1x S 816 300

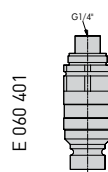
Connection hardware, chuck – pump

Connection hardware for the chuck

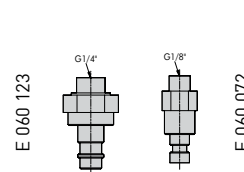
HCP/HHP/HHPA
S 816 900



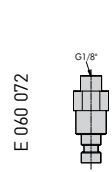
HSP
E 060 401



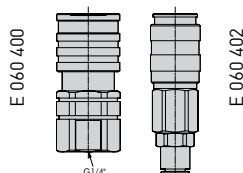
PHP/PHPA
S 816 950



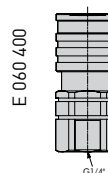
PSP
E 060 072



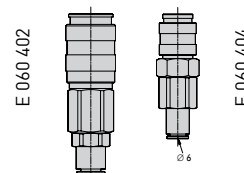
Connection hardware for the pump



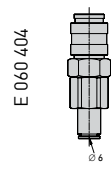
S 816 910
HCP/HHP/HHPA



E 060 400
HSP



S 816 960
PHP/PHPA



E 060 404
PSP

Accessories Delphin

Reference mandrel

Alignment aid for chuck installation.

- Material: steel stainless, hardened and ground

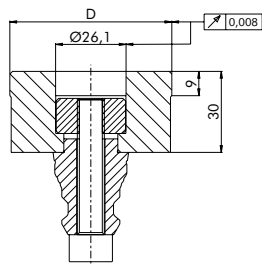
C 288 070

- For all chucks except PHPA/HHPA
- Diameter D = 60 mm



C 288 170

- For all chucks
- Diameter D = 110 mm



Pallet for 1 chuck HHP or PHP with indexing

With handling contour, prepared for chip.

- Dimensions: \varnothing 156 x 30 mm
- 1 index pin in scope of delivery
- Required drawbar: C 282 000 (not in scope of delivery)

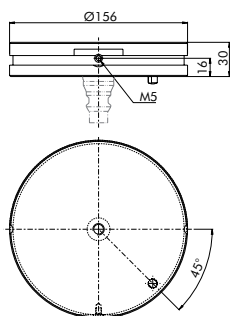
C 288 000

Aluminium



C 288 010

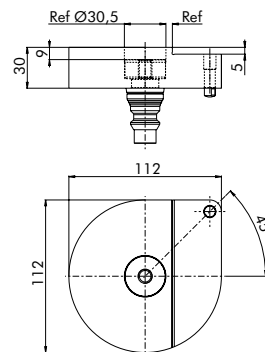
Steel



Reference pallet for HHP or PHP with indexing

C 288 040

- Material: steel stainless, hardened and ground
- Dimensions: 112 x 112 x 30 mm



Indexing pins for indexing pallet

S 814 000

For customer installation in indexing pallet.

- Material: steel, hardened
- Dimensions: \varnothing 8 x 20 mm
- Scope of delivery: 4 pieces
- Require mounting device C 286 080



Z supports

Additional supports on base plates for pallets.

C 286 200

Suitable for Delphin PSP/PHP/PHPA

- Height H = 15 mm

C 286 210

Suitable for Delphin HCP/HSP/HHP/HHPA

- Height H = 13 mm

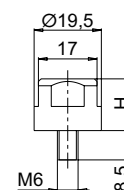
Mounting device for indexing pins

C 286 080

For customer installation of index pins S 814 000 in pallet.



Example application



Accessories Delphin

Protective pallet for HCP

C 286 140

Chip protection for HCP chuck, full-coverage.

- Required drawbar: C 282 000 (not in scope of delivery)
- Material: aluminium, anodised
- Dimensions: \varnothing 113 x 22 mm



Protective pallet for HSP

C 266 040

Chip protection for HSP chuck, full-coverage.

- Matching seal ring C 266 090.
- Required drawbar: C 282 000 (not in scope of delivery)
- Material: aluminium, anodised
- Dimensions: \varnothing 139 x 20 mm



Protective pallet for HHP/HHPA/PSP/PHP/PHPA

C 286 040

Chip protection for HHP, HHPA, PSP, PHP, PHPA chucks, full-coverage.

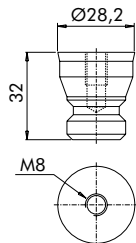
- Matching seal ring C 286 090.
- Required drawbar: C 282 000 (not in scope of delivery)
- Material: aluminium, anodised
- Dimensions: \varnothing 159.5 x 20 mm



Locking spigot C 286 060

Chip protection for chuck, seals centre bore, Z-support of chuck remains usable.

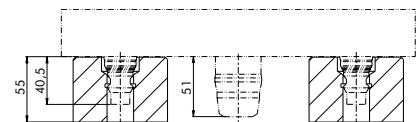
- Material: plastic
- Dimensions: \varnothing 28 x 32 mm
- M8 for dismounting



Protection support drawbar C 286 050

Supports and protects drawbar when storing pallets and devices.

- Material: plastic
- Dimensions: \varnothing 80 x 55 mm



Seal rings

Protect the chucks against chips and liquids.

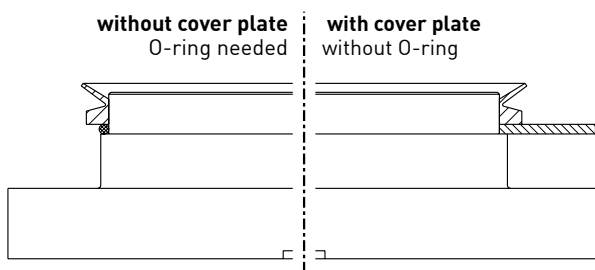
C 266 090

For Delphin HSP

C 286 090

For Delphin HHP, HHPA, PSP, PHP, PHPA

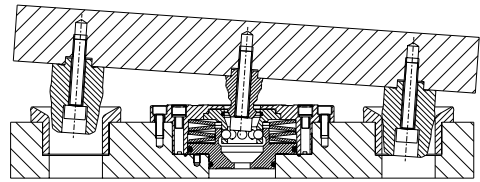
Mounting with or without cover plate



Accessories Delphin

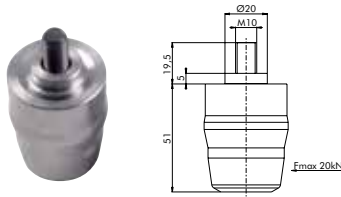
Pre-centring spigot / Pre-centring bush

Pre-centring for mid-sized to large workpieces.
Should always be used wherever possible.



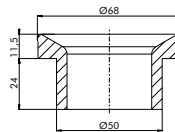
C 286 160

Pre-centring spigot for the pallet / device



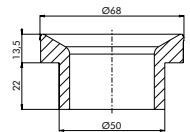
C 286 150

Pre-centring bush for HCP/HSP/HHP/HHPA



C 286 250

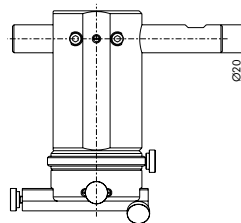
Pre-centring bush for PSP/PHP/PHPA



Indicator, rotary holder

C 288 060

For positioning of chucks on horizontal machine table.
• Material: steel, stainless, hardened and ground



Clamping force test unit

The clamping force test unit tests the clamping force of the chucks.

C 288 050

For HHP / HSP / PHP / PSP

C 288 150

For all Delphin chucks



Electronic clamping force test unit

S 180 150

The electronic clamping force test unit measures the clamping force of the chucks.

- For all Delphin chucks



Accessories Delphin

Set accessories fixation M8

C 289 100 - xx *

Scope of delivery

- 4x E 000 331 socket head hexagon screws M8x40
- 4x E 000 334 socket head hexagon screws M8x50
- 4x E ... T-nuts of your choice
- 4x E 010 124 plain washers M8

T-nuts - To be defined optionally:

- 4x E 040 020 T-nuts M8x12
- 4x E 040 021 T-nuts M8x14
- 4x E 040 022 T-nuts M8x16
- 4x E 040 023 T-nuts M8x18

Set accessories fixation M10

C 289 110 - xx *

Scope of delivery

- 4x E 000 401 socket head hexagon screws M10x40
- 4x E 000 409 socket head hexagon screws M10x50
- 4x E ... T-nuts of your choice
- 4x E 010 103 plain washers M10

T-nuts - To be defined optionally:

- 4x E 040 030 T-nuts M10x12
- 4x E 040 031 T-nuts M10x14
- 4x E 040 032 T-nuts M10x16
- 4x E 040 033 T-nuts M10x18

Set accessories fixation M12

C 289 120 - xx *

Scope of delivery

- 4x E 000 465 socket head hexagon screws M12x40
- 4x E 000 502 socket head hexagon screws M12x50
- 4x E ... T-nuts of your choice
- 4x E 010 114 plain washers M12

T-nuts - To be defined optionally:

- 4x E 040 034 T-nuts M12x14
- 4x E 040 035 T-nuts M12x16
- 4x E 040 036 T-nuts M12x18



* Ordering code for these sets:
item number - slot width

Example order for
set accessories fixation M8 with slot width 14:
C289 100 - 14

Other sizes on request.

Machine table fixing sets for Take

Set with the necessary number of screws, washer and T-nuts for Take 4 or Take 6 baseplates.

for Take 4

C 289 180 - xx *

for Take 6

C 289 190 - xx *

* Ordering code for these sets:
item number - slot width

Example order for Take 4, slot width 14:
C289 180 - 14

Standard slot width: 14, 16 and 18

Other sizes on request.

Seal set for slotted holes

Set with the necessary number of seals for the slotted holes of the Take 4 or Take 6 baseplates.

for Take 4

S 820 040

for Take 6

S 820 060



Cover plates Delphin / Delphin BIG

Cover plates Delphin / Delphin BIG

The cover plates are manufactured customer-specifically to your specifications.

Scope of delivery

1x cover plate, type A, B or C
 16x E 005 156 setscrew (mounting aid)
 16x E 111 111* T-nuts of your choice

T-nuts - to be defined optionally:

16x E 040 020 T-nuts M8x12
 16x E 040 021 T-nuts M8x14 (standard)
 16x E 040 022 T-nuts M8x16
 16x E 040 023 T-nuts M8x18

For Delphin:

16x C 286 033 supports Delphin
 16x E 000 974 screws M8x60

For Delphin BIG:

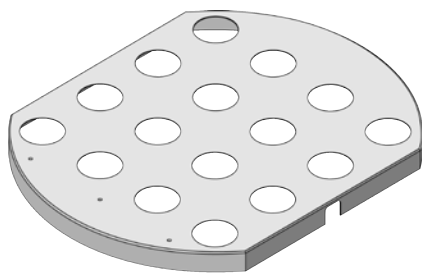
16x C 286 036 supports Delphin BIG
 16x E 000 971 screws M8x45

* When ordering, please specify the machine table data.
 Unless otherwise specified, the standard T-slot will be supplied.

Cover plate type A

C 287 300

Dimensions in the range 1500 x 1500 mm



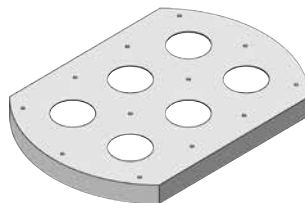
16 each:



Cover plate type B

C 287 310

Dimensions in the range 1150 x 1150 mm



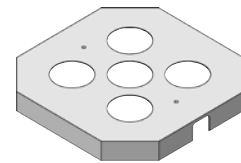
12 each:



Cover plate type C

C 287 320

Dimensions in the range 700 x 700 mm



6 each:



Standard pallets Delphin

Our Delphin standard pallets are available as simple pallets with spigots and as automation pallets with spigots, handling contour and chip bore.

The pallets are ground on both sides. The upper side of the pallet is ground when chucked for an optimum, flat bearing surface.

Note: It is important that the underside of the pallet be ground for presence monitoring of the pallets in automation.



Pallets for 2 chucks with 2 drawbars

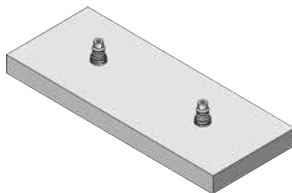
- Material: unalloyed tool steel
- Dimensions for centre distance 250 mm: 246 x 496 mm
- Dimensions for centre distance 200 mm: 196 x 396 mm
- Thickness: 40±0.01 mm, two-sided ground
- 2 drawbars incl. in scope of delivery

C 282 600

Centre distance: 250 mm

C 282 630

Centre distance: 200 mm



Pallets for 4 chucks with 4 drawbars

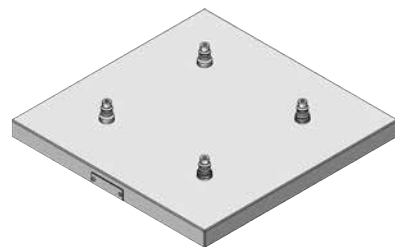
- Material: unalloyed tool steel
- Dimensions for centre distance 250 mm: 496 x 496 mm
- Dimensions for centre distance 200 mm: 396 x 396 mm
- Thickness: 40±0.01 mm, two-sided ground
- 4 drawbars incl. in scope of delivery

C 282 620

Centre distance: 250 mm

C 282 650

Centre distance: 200 mm



Automation pallets steel

For 4 chucks, prepared for automation

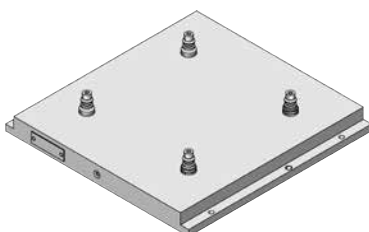
- Material: unalloyed tool steel
- Dimensions: 450 x 450 mm
- Thickness: 42±0.01 mm, two-sided ground
- 4 drawbars incl. in scope of delivery

C 282 740

Centre distance: 250 mm

C 282 750

Centre distance: 200 mm



Automation pallets aluminium

For 4 chucks, prepared for automation

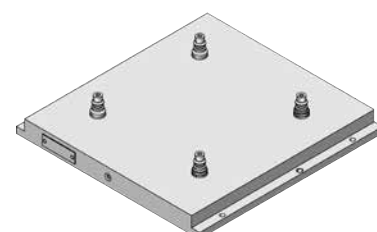
- Material: Aluminium
- Dimensions: 450 x 450 mm
- Thickness: 42±0.01 mm, two-sided ground
- 4 drawbars incl. in scope of delivery

C 282 710

Centre distance: 250 mm

C 282 730

Centre distance: 200 mm



Customised Delphin applications

The modular structure of the Delphin zero-point clamping system means that virtually all customer-specific solutions can be implemented.

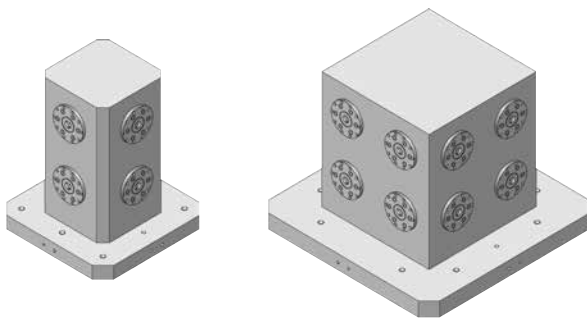
Examples:

- Delphin base plates with customer-specific arrangement of the chucks
- Turret with chucks for use in vertical machines
- Pallet with angle structure

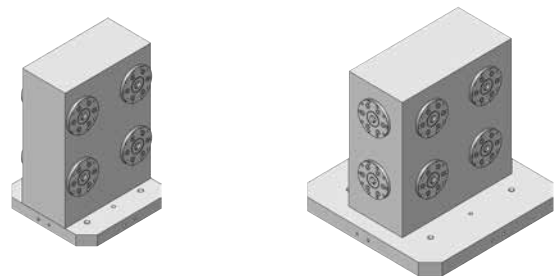
Our engineering department, which has a wealth of experience, is specialised in producing solutions which are tailored specifically to meet your needs.



Cube with 8 or 16 Delphin chucks on request



Double angle with 8 or 12 Delphin chucks on request



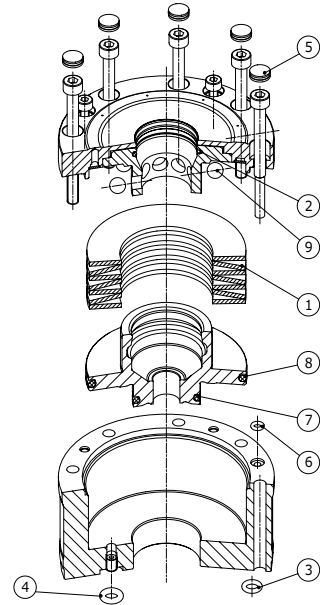
Spare parts Delphin

Spare parts for HCP S 840 040

Pos	Qty	Art.no.	Description
1	7	E 010 333	Cup spring
2	1	E 020 323	O-ring
3	1	E 020 333	O-ring
4	1	E 020 342	O-ring
5	12	E 020 904	Cover
6	1	E 020 392	O-ring
7	1	E 020 423	O-ring
8	1	E 020 428	O-ring
9	8	E 020 707	Ball

Recommendation:

Minor service every year (exchange springs and O-rings, clean and function inspection)
Major service every 2 years (as for minor service plus replacement of all spare parts)

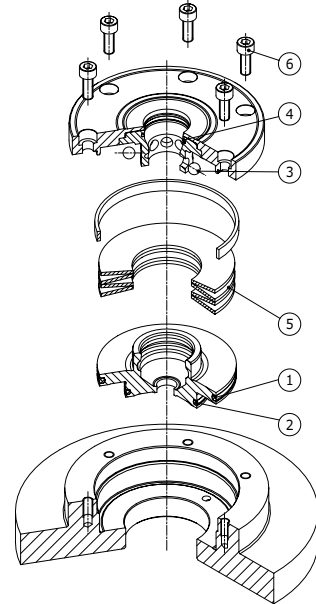


Spare parts for HSP S 840 000

Pos	Qty	Art.no.	Description
1	2	E 020 418	O-ring
2	1	E 020 419	O-ring
3	8	E 020 707	Ball
4	1	E 020 323	O-ring
5	4	E 010 330	Cup spring
6	6	E 000 233	Screw M6x16

Recommendation:

Minor service every year (exchange springs and O-rings, clean and function inspection)
Major service every 2 years (as for minor service plus replacement of all spare parts)

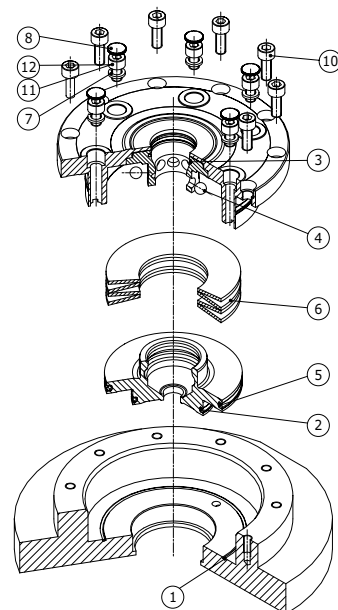


Spare parts for HHP S 840 010

Pos	Qty	Art.no.	Description
1	1	E 020 415	O-ring
2	1	E 020 419	O-ring
3	1	E 020 323	O-ring
4	8	E 020 707	Ball
5	1	E 020 418	O-ring
6	4	E 010 330	Cup spring
7	6	C 280 008	Ring
8	6	C 280 009	Cover
9	2	E 020 331	O-ring for C 280 1xx
10	10	E 000 233	Screw M6x16
11	6	E 000 224	Screw M6x40 (built-in)
12	6	E 000 208	Screw M6x10 (built-up)

Recommendation:

Minor service every year (exchange springs and O-rings, clean and function inspection)
Major service every 2 years (as for minor service plus replacement of all spare parts)



Spare parts Delphin

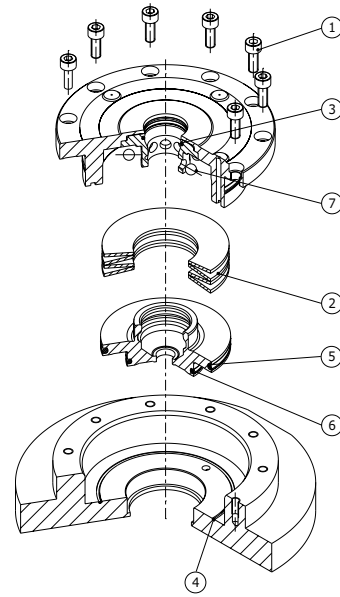
Spare parts for HHPA S 840 060

Pos	Qty	Art.no.	Description
1	10	E 000 243	Screw M6x16
2	4	E 010 330	Cup spring
3	1	E 020 323	O-ring
4	1	E 020 415	O-ring
5	1	E 020 418	O-ring
6	1	E 020 419	O-ring
7	8	E 020 707	Ball

Recommendation:

Minor service every year (exchange springs and O-rings, clean and function inspection)

Major service every 2 years (as for minor service plus replacement of all spare parts)



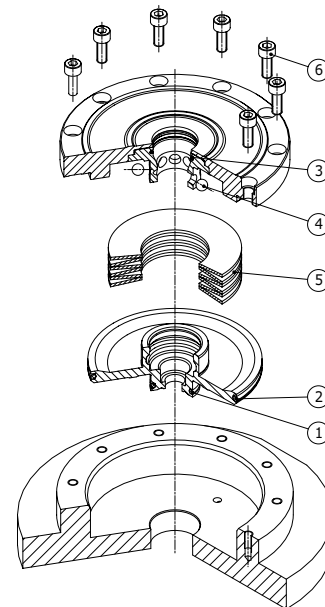
Spare parts for PSP S 840 030

Pos	Qty	Art.no.	Description
1	1	E 020 423	O-ring
2	1	E 020 422	O-ring
3	1	E 020 323	O-ring
4	8	E 020 707	Ball
5	6	E 010 332	Cup spring
6	10	E 000 233	Screw M6x16
7	1	E 020 356	O-ring (built-in)

Recommendation:

Minor service every year (exchange springs and O-rings, clean and function inspection)

Major service every 2 years (as for minor service plus replacement of all spare parts)



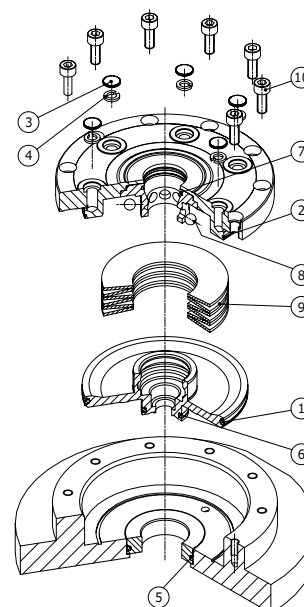
Spare parts for PHP S 840 020

Pos	Qty	Art.no.	Description
1	1	E 020 422	O-ring
2	1	E 020 421	O-ring
3	6	C 280 009	Cover
4	6	C 280 008	Ring
5	1	E 020 419	O-ring
6	1	E 020 423	O-ring
7	1	E 020 323	O-ring
8	8	E 020 707	Ball
9	6	E 010 332	Cup spring
10	10	E 000 233	Screw M6x16
11	1	E 020 385	O-ring (built-in)
12	1	E 020 376	O-ring (built-in)

Recommendation:

Minor service every year (exchange springs and O-rings, clean and function inspection)

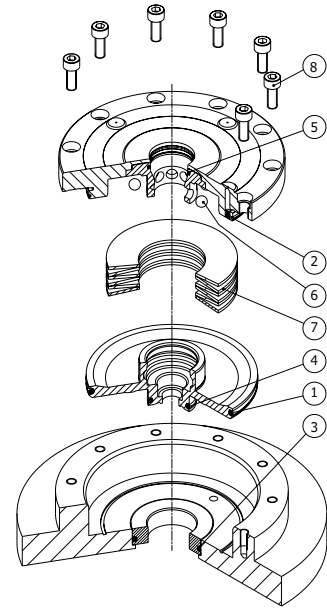
Major service every 2 years (as for minor service plus replacement of all spare parts)



Spare parts Delphin

Spare parts for PHPA S 840 050

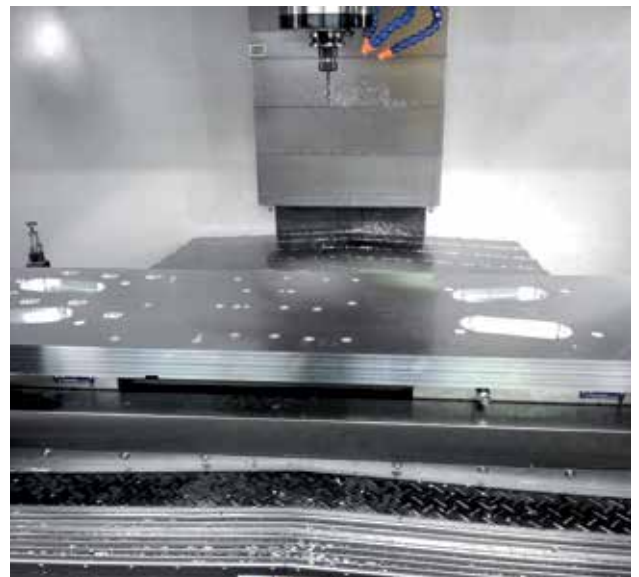
Pos	Qty	Art.no.	Description
1	1	E 020 422	O-ring
2	1	E 020 421	O-ring
3	1	E 020 419	O-ring
4	1	E 020 423	O-ring
5	1	E 020 323	O-ring
6	8	E 020 707	Ball
7	6	E 010 332	Cup spring
8	10	E 000 243	Screw M6x16



Recommendation:

Minor service every year (exchange springs and O-rings, clean and function inspection)

Major service every 2 years (as for minor service plus replacement of all spare parts)



Delphin BIG for large part manufacturing

The largest member of the Delphin family ventures into new dimensions.

The modular Delphin BIG zero-point clamping system allows the machine table to be equipped with position-determining chucks.

This opens up entirely new approaches for production of large workpieces or production of large moulds.

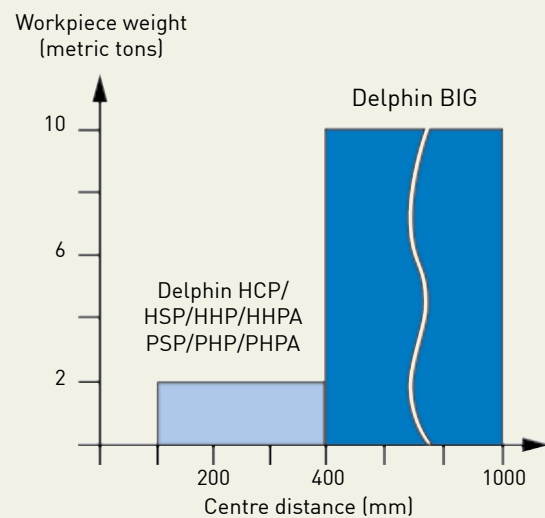
Delphin BIG allows the workpiece to be clamped outside the machine, thus offering major cost savings from reduced set-up times and enhanced flexibility.

Delphin BIG is suitable for manual and automated applications.

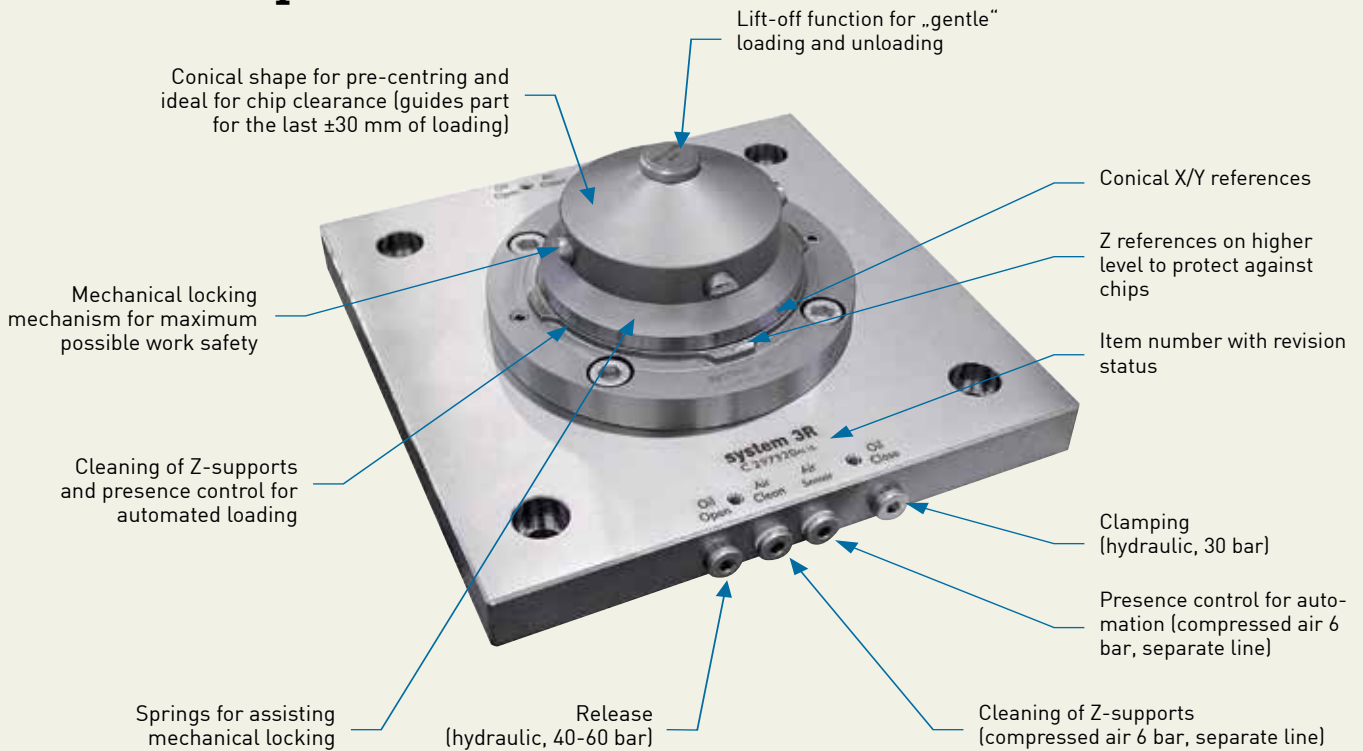


Your advantages

- ✓ Can be used for large workpieces
- ✓ Maximize machining times thanks to reduction of set-up times by up to 90%
- ✓ Unmanned production option thanks to automation
- ✓ Universal palletisation for metal-cutting manufacturing and measurement processes
- ✓ Simple loading thanks integrated pre-centring
- ✓ Thermal expansion of the workpieces of up to ± 0.4 mm can be accommodated
- ✓ High clamping forces for high-performance machining



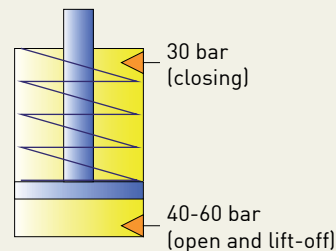
Chuck Delphin BIG



Technical data

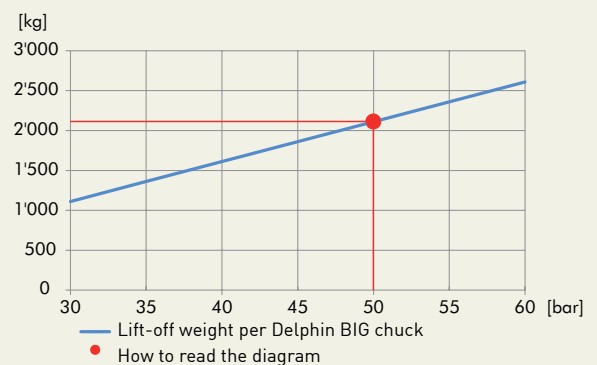
Workpiece weight (recommended)	<10'000 kg
Centre distance (recommended)	400 - 1000 mm
Clamping force	50 kN
Holding force	100 kN
Presence control	yes
Lift-off function	yes, 2 mm
Max. lift-off weight per chuck	pressure-dependent (see diagram)
Releasing	hydraulic 40-60 bar
Clamping	hydraulic 30 bar and locked mechanically
Material	steel, hardened
Repetition accuracy	± 0.005 mm
Compressed air	6 bar
Recommendation	at least 4 chucks per application

Hydraulic



Closing: 30 bar
 Opening: Recommendation 40-50 bar
 The opening pressure can also be 30 bar as for closing.
 The lift-off force will be reduced to 1100 kg per chuck.

Max. lift-off weight per chuck



How to read the diagram:
 A chuck Delphin BIG revision 4 can raise a weight of 2100 kg at an hydraulic pressure of 50 bar. A chuck Delphin BIG up to revision 3 may raise a weight of maximal 1500 kg.

Product overview Delphin BIG

	Item number without mounting bores	Item number with mounting bores	Page
Chucks			
Built-in	C297 000		68
Built-up	C297 310	C297 320	68
Cover plates			
		Item number	Page
Cover plate type A		C287 300	56
Cover plate type B		C287 310	56
Cover plate type C		C287 320	56
Z Supports			
		C297 510 / C297 520	68
Hydraulic power pack			
		C297600	70
Connection block			
		C297 030	70
Connection equipment if using cover plate			
Connections for 4 chucks		S819 100	70
Cups / Rings			
	Centring		
Cup	in 2 axes	C298 000	69
Cup	in 1 axis	C298 100	69
Cup	without	C298 200	69
Ring	in 2 axes	C298 010	69
Ring	in 1 axis	C298 110	69
Ring	without	C298 210	69
Protective pallet			
		C298 340	69
Miscellaneous			
Indicator rotary holder, for horizontal machines		C288 060	54
Sets accessories fixation			
Set accessories fixation M12 / M10 / M16		C289 150 / C289 160 / C289 170	55
Spare parts			
		S850 000	71

Clamping non-symmetrical workpieces

In the case of non-symmetrical workpieces, it is frequently the case that they cannot be lifted horizontal. They are suspended at an angle on the frame. When clamping on conventional chucks, this inclined position poses major problems.

This is not the case on Delphin BIG. As shown by the illustration, the workpiece can still be clamped with no major problems even with major inclination.



Z-support guard

The Z-supports of Delphin BIG clamping bushings and rings are protected by an all-round ring: the Z-supports remain protected if the workpiece is placed on the floor.

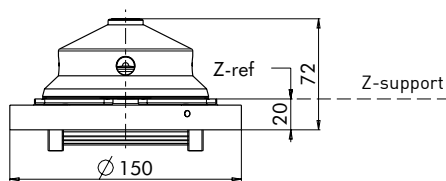
If the workpiece moves into the chucks, the edge of the bushing strikes the cone of the chuck. These minor impacts may leave notches on the clamping bushing. There is a recess at the end of the cone (chuck) in order to prevent inaccuracies of the system, consequently ensuring constant accuracy.



Installation and mounting dimensions Delphin BIG

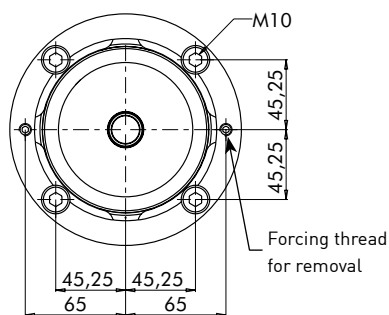
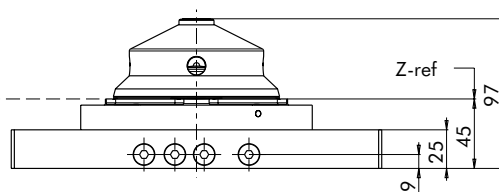
Chuck built-in

(in machine table)

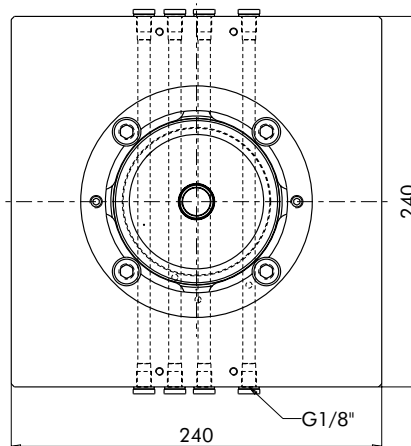


Chuck built-up

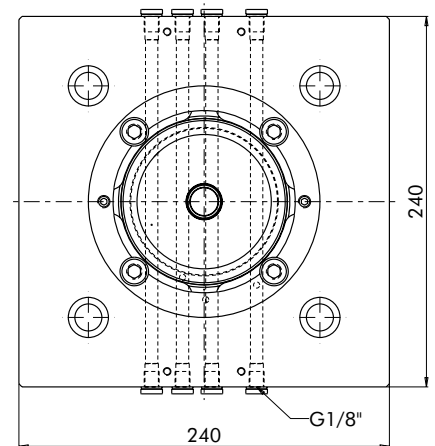
(on machine table)



without mounting bores



with mounting bores



Cups Delphin BIG

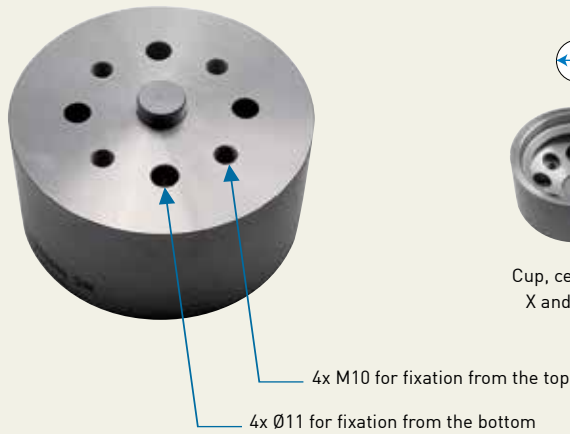
The cups are fitted directly to the device or workpiece.

The Z-support is located inside the cup and is thus protected against damage and contamination.

Centring of the conical face of the centring and compensating cups without backlash achieves the high level of repeat accuracy.

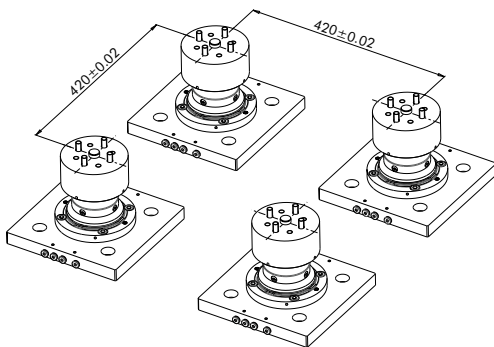
Advantages

- ✓ Centring free of play
- ✓ Protected reference surfaces X, Y, Z
- ✓ Easy mounting to devices and workpieces
- ✓ Fixing to part or device from the top (45° offset) or bottom of the cups

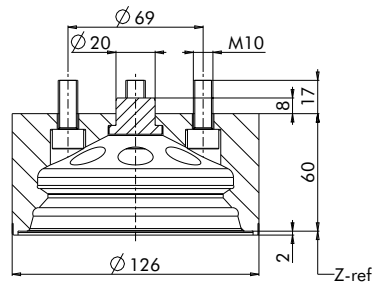


Positioning

Positioning tolerance for cups and chucks

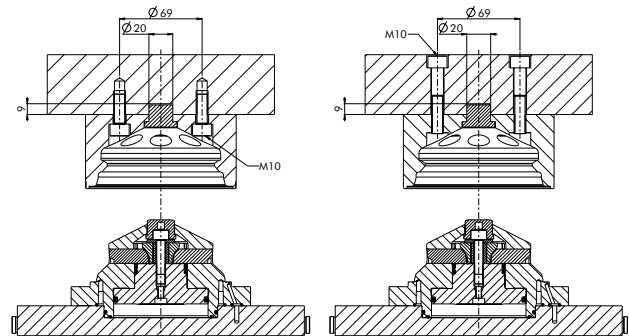


Dimensions



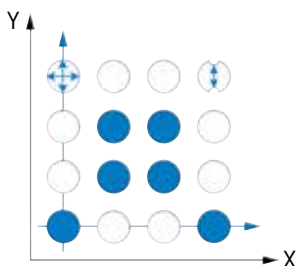
Installation of cups

shows fixation from the bottom shows fixation from the top



Built-up and built-in can be screwed from the bottom or from the top.

Example arrangement



Rings Delphin BIG

The rings are fitted directly to the device or workpiece.

The Z-support is located inside the ring and is thus protected against damage and contamination.

Centring of the conical face of the centring and compensating rings without backlash achieves the high level of repeat accuracy.

A bore must be provided on the workpiece for the chuck.

Advantages

- ✓ Centring free of play
- ✓ Protected reference surfaces X, Y, Z
- ✓ Easy mounting to devices and workpieces
- ✓ Fixing to part or device from the top (45° offset) or bottom of the rings



Ring, centred on X and Y axes



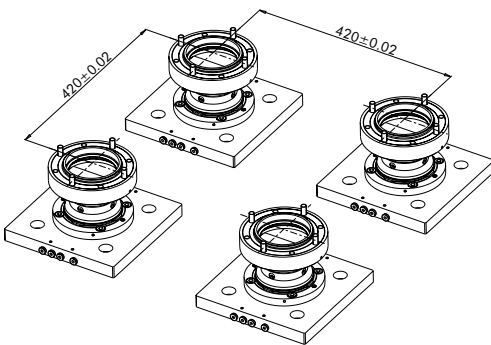
Ring, centred on X or Y axis



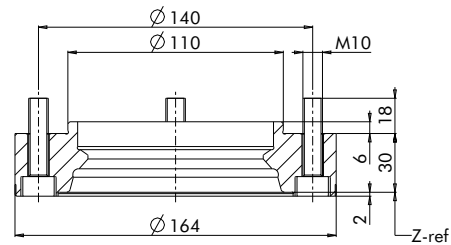
Ring without centring function

Positioning

Positioning tolerance for rings and chucks

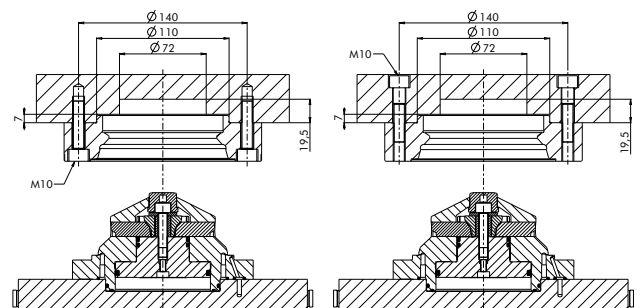


Dimensions



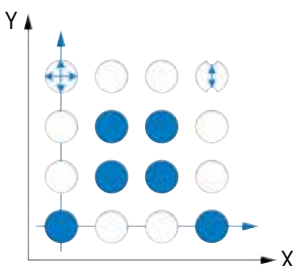
Installation of rings

shows fixation from the bottom shows fixation from the top



Built-up and built-in can be screwed from the bottom or from the top.

Example arrangement



Delphin BIG

Chuck Delphin BIG built-in C 297 000

For simple installation in the machine table.



Chuck Delphin BIG with flange, without mounting bores C 297 310

Mounting bores can be made by customer
Recommendation: at least 4 chucks per application

- Chuck C 297 000



Chuck Delphin BIG with flange, with mounting bores C 297 320

Please submit dimension diagram of the mounting bores
Recommendation: at least 4 chucks per application

- Chuck C 297 000



Z supports Delphin BIG

Additional supports for pallets.

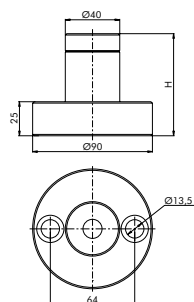
C 297 510

Suitable for pallets with rings
• Height H = 75 mm



C 297 520

Suitable for pallets with cups
• Height H = 105 mm



Delphin BIG

Cup Delphin BIG centring in 2 axes C 298 000

including fixation screws



Cup Delphin BIG centring in 1 axis C 298 100

including fixation screws



Cup Delphin BIG without centring C 298 200

including fixation screws



Ring Delphin BIG centring in 2 axes C 298 010

including fixation screws



Ring Delphin BIG centring in 1 axis C 298 110

including fixation screws



Ring Delphin BIG without centring C 298 210

including fixation screws



Protective pallet Delphin BIG C 298 340

Chip protection for Delphin BIG chucks and for presence control on unused chucks.

- Material: aluminium, anodised
- Dimensions: \varnothing 124 x 58 mm



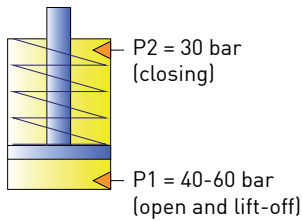
Accessories Delphin BIG

Hydraulic power pack

C 297 600

Easy operation for manual use or for direct control via the interface. Interface provided for machine signals. Including connection block and connection tubes.

- Functions: opening - closing - cleaning - presence controll
- Oil pressure: $P_1 = 40-60$ bar, preset: 50 bar / $P_2 = 30$ bar
- Air pressure: 6 bar
- Power: 0.75 kW



Connection block

C 297 030

- Material: Steel
- Dimensions: 170x30x50 mm
- Scope of delivery: fixation material



Set connection equipment for 4 chucks

S 819 100

Scope of delivery: hydraulic pipes and air hoses and fittings



Set accessories fixation

For fixing on machine table

Set fixation M12

C 289 150 - xx *

Set fixation M10

C 289 160 - xx *

Set fixation M16

C 289 170 - xx *



* Ordering code for these sets:
item number - slot width

Example order for
set accessories fixation M16 with slot width 18:
C289 170 - 18

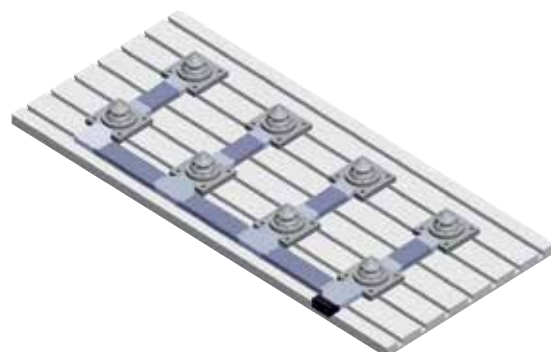
Standard slot width: 12, 14, 16 and 18
Other sizes on request.

Standard cover plates

See page 52

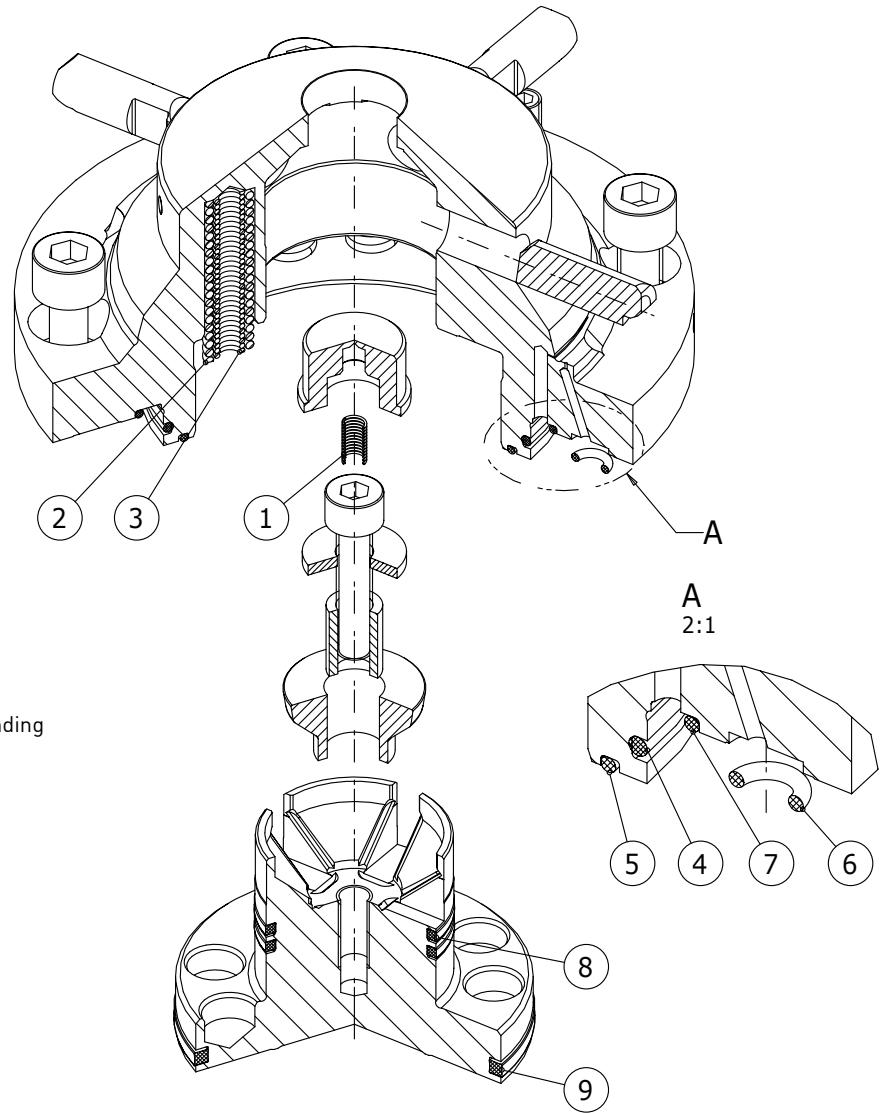
Special cover plates on request

For the protection of the connecting tubes



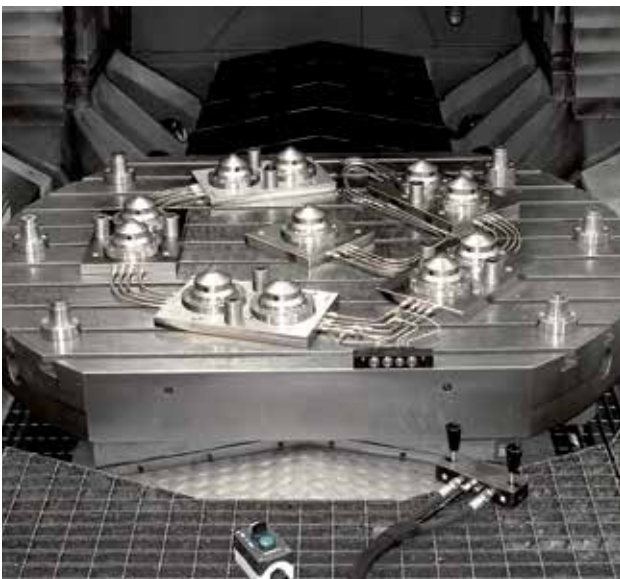
Spare parts Delphin BIG

Spare parts
S 850 000



Pos	Qty	Item Nr	Description
1	1	E010328	Spring
2	8	E010335	Spring
3	8	E010336	Spring left-winding
4	1	E020314	O-Ring
5	1	E020367	O-Ring
6	2	E020381	O-Ring
7	1	E020426	O-Ring
8	2	E020990	X-Ring
9	1	E020991	X-Ring

Recommendation:
Change the spare parts every two years



Automation

Utilise every hour of the day and night!

An automatic production cell can generate revenue round the clock, seven days a week. Why be satisfied with 40 productive machine-hours a week when the same machine can achieve over 100 additional hours a week? Use every hour of the day and night for production!

WorkPal, WorkPartner, Transformer und Fanuc – four “aces” which boost your productivity and sharpen your competitiveness.

And not least – they bring faster payback on the investments you made.



Transformer – a modular automation concept

Transformer is a versatile automation concept for a variety of applications in one or more milling machines and/or wire EDM machines, for instance. And changing can be done both in the machine spindle and on the machine table.

The changer unit is completely self-contained and can be adapted to “tailor-made” automation solutions with several types of magazine, as well as a number of options. One, two or three machines in the same production cell.

One clear advantage is the “open architecture” of the system. The customer chooses the machine (or machines) suited to the particular requirements of the business, and a Transformer is added.

Automation – with six-axis Fanuc industrial robot

System 3R offer automation solutions with industrial robots, both stationary and rail versions within the Die & Mold and Precision Production sector.

Fanuc solutions covers applications in terms of ...

- ... transfer weight from 70-700 kg
- ... radial reach, up to 3 400 mm
- ... complexed transfer movements
- ... parts handling.



Reference systems

For applications with workpiece weights up to 250 kg reference systems are also suitable.

The advantage of the reference systems lies in their very high precision and the standardised pallets.

The machining zero point is defined by the centre of the chuck.

The chuck can be mounted on the machine table of any machine tool.

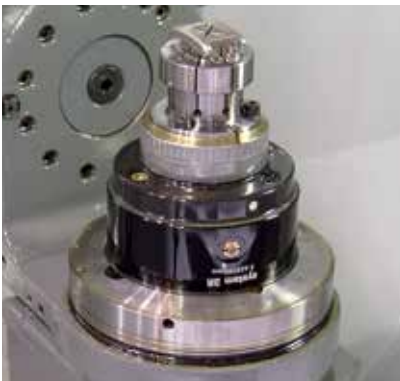
The workpieces and fixtures can be mounted on the pallets. The fixation through the pallet from below permits a collision-free 5-way machining.

Advantages:

- Repetition accuracy 0.002mm.
- Versatile range of standardised pallets , depending on the system from 54x54mm up to 400x400mm.
- Different systems are available for adaptation to your application. (Workpiece size, workpiece weight, machining, manual or automated operation).

GPS 70

- Workpiece weight up to 10 kg
- Clamping without drawbar
- Economical pallets
- Sealed pallet interface
- Suitable for automation.



GPS 120

- Workpiece weight up to 20 kg
- Clamping without drawbar
- Economical pallets
- Sealed pallet interface
- Suitable for automation.



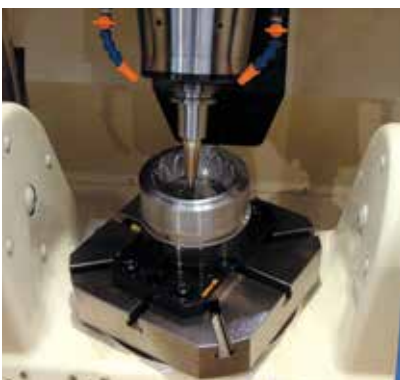
GPS 240

- Workpiece weight up to 100 kg
- Clamping without drawbar
- Economical pallets
- Sealed pallet interface
- Suitable for automation.



Macro

- Workpiece weight up to 50kg
- High clamping force
- High stability
- Versatile range of holder sizes
- Suitable for automation.



Macro Magnum

- Workpiece weight up to 100 kg
- High clamping force
- High stability
- Versatile range of holder sizes
- Suitable for automation.



Dynafix

- Workpiece weight up to 250 kg
- Clamping without drawbar
- Economical pallets
- Sealed pallet interface
- Suitable for automation.



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Optimize the uptime of your equipment with our Customer Services

- + Ensuring productivity.
- + Reducing running costs and wasted parts.
- + Maximizing the return on your System 3R investments.
- + Extending the product lifetime of your System 3R equipment while maintaining optimum precision.
- + Ensuring robot cell safety satisfies present machine directives.

System 3R's Customer Services is uniquely positioned to help you maximize the availability, value, precision and productivity of your System 3R equipment. Our cost-effective, customer-centric and expert services put your success at the center, ramp up your productivity and ensure predictable, uninterrupted uptime. System 3R's service engineers are your expert partners for a wide range of success-triggering services.

For more info ask your local System 3R dealer.

For contact details, please refer to:
www.system3r.com.

