



ORIGINAL

INSTRUCTION MANUAL

AUTOMATIC POSITIONING SYSTEM

APS



Date: 2016-11
Version: 4
Language: English (English)



Content

Declaration of incorporation	4
General safety instructions	5
Customer Benefits / Overview APS Versions	6
Description of function	8
Technical data	10
Accessories	28
Composition of the supply	29
Technical data overview	29
Mounting	30
Clamping pins	31
Instruction and examples of the mounting	32
Maintenance	33
Disassembling / Assembling	33
Spare part list	34
Trouble shooting	37
Warranty 12 and 24 months	38
Documentation of maintenance	40
Confirmation of receipt of the manual	45



INSTRUCTION MANUAL

Automatic positioning system

Type APS

Thank you for purchasing an Original-SMW-AUTOBLOK automatic positioning system type APS.

This **instruction manual** contains the installation, the use and the maintenance instructions of the work holding „APS“.

SMW-AUTOBLOK reserves the right to make **changes without notice**.

This **instruction manual is a part of the work holding** and must be passed to the new owner in case of sale.

This **instruction manual may not be** -in whole or in part- **copied** without our written agreement.



Please read the instruction manual carefully before installation and use and always follow the regulations.

Please note especially the sections which are marked with the following signs:



- Danger of injury or danger to life if instructions are not followed.
- Danger of damage to the work holding, the machine or the components.

Declaration of incorporation for an incomplete machine Machinery Directive 2006/42/EC, Annex II, B

The manufacturer: SMW-AUTOBLOK Spannsysteme GmbH
Wiesentalstrasse 28
88074 Meckenbeuren
Deutschland / Germany

herby declares, that the following product:

Product description: Automatic Positioning System
Application range: Installation in machine tool
Type: APS

is intended to be installed into a completed machine. It must not be put into service until the final machine into which the partly completed machinery it is to be incorporated has been declared in conformity with the provisions of the EU machine directive (2006/42/EC) Annex II, B.

Applied harmonized norms:

- DIN EN 1550 (2008)
- DIN ISO 13857 (2008)

The following basic requirements of Annex I, 2006/42/EC are complied with:

- No. 1, 1.1, 1.1.1, 1.1.2, 1.1.3
- No. 1.3.2, 1.3.3, 1.3.4, 1.3.7, 1.3.8
- No. 1.5, 1.6.1
- No. 1.7.1, 1.7.3, 1.7.4













The special technical documents have been created in accordance with Annex VII, Part B. These documents will be made available electronically on a reasoned request by the national authorities.

Responsible for documentation: Schilling Rainer
Chief designer

Place: Meckenbeuren (Germany)
Date: 15.03.2016



Eckhard Maurer
President

-  **1. Correct use**
This SMW-AUTOBLOK product is designed for positioning and clamping pallets or workpieces. Any other use can cause hazards. For any damages resulting herefrom SMW-AUTOBLOK is not responsible.
-  **2. Demands on operators**
This SMW-AUTOBLOK product must be installed, operated and maintained only by qualified and regularly trained personnel.
-  **3. Visual inspection**
Please check the product for visible damage prior to use!
-  **4. Transport**
Please use suitable lifting gear for product heavier than 16 kg!
-  **5. Safety precautions**
The system is spring-packaged. Risk of injury due to independent motions of components into its end positions after pressing the „Emergency stop“ or switching off or failure of the energy supply.
- Wait until the system stops completely.
 - Do not reach into the clamping modules.
 - Use pressure maintenance valves.
- Danger of injury due to loosening of incorrectly connected compressed air hoses:
- Wear safety valves or safety switches.
 - The danger zone must be surrounded by a protective enclosure during operation.
-  **6. Product safety**
- Disconnect the energy supply lines and ensure that there is no residual energy in the system when performing assembly, modification, maintenance or adjustment work.
 - Perform maintenance work, modifications and attachments outside the danger zone.
 - Do not reach into the open mechanical parts of the clamping pin holder.
-  **7. Technical data**
For any reason, never exceed the technical data limitation written in the following pages: maximum gripping force, maximum operating pressure and minimum air quality, lubrication and filtration requirements.
-  **8. Loading of the component to be machined**
In case of manual loading of the component there is a risk for the operator to have his fingers crushed between the clamping jaws and the component.
-  **9. Remaining risks**
The type of component (shape, weight, unbalance, material etc.) has a big influence on the safe operation of the system “machine tool – positioner – component”.
For these reasons, there are always residual risks. These residual risks must be calculated by the user and must be limited or eliminated by suitable actions.
-  **10. Maintenance**
The SMW-AUTOBLOK product must be maintained in regular intervals, check often the conditions, visually check the movement of the valve closing the positioner without central pin.
Replace damaged parts with original SMW-AUTOBLOK spare parts only.
-  **11. Environment protection**
Danger for environment when handling incorrect!
Incorrect handling of environment hazardous materials, especially the disposal, may result in environmental damage.
- Always follow below instructions.
 - In case environmentally hazardous material polluted the environment always take suitable actions immediately. If in doubt, inform the local authority about the pollution.
- The following hazardous materials are used: Lubricants such as oil and grease can contain poisonous agents. They must not pollute the environment. The disposal must be carried out by a suitable waste management company.
For a proper function of the work holding, use original SMW-AUTOBLOK lubricant only.
-  **For any problems or questions please contact SMW-AUTOBLOK directly or one of our authorized offices.**

APS Zero Point Clamping System



Industry 4.0
Product



proofline® series
fully sealed – low maintenance

Customer Benefits

- Significantly reduced costs due to reduced set-up times
- Modular construction kit system: existing clamping systems can be modified very easy
- Low installation height due to the compact design
- Highest process reliability and repeat accuracy < 0.005 mm
- Wear-resistant and protected against rust (or stainless) due to heat treated elements and an extra hard protective coating
- Maximum pull-in forces until 45 kN (APS 190) thanks to turbo function
- Highest stiffness by means of 3 clamping slides (Premium / Top-Version)
- Fully sealed (proofline)

Overview APS Versions

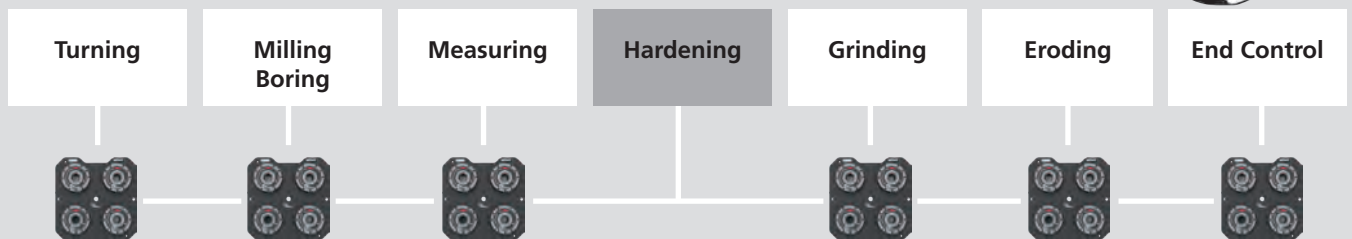
BASIC	PREMIUM	TOP
 <ul style="list-style-type: none"> ■ Protective coating ■ 2 Clamping slides ■ Turbo function ■ Rust protected ■ Sealed 	 <ul style="list-style-type: none"> ■ Protective coating ■ 3 Clamping slides (not APS 100) ■ Turbo function ■ Monitoring via air control ■ Anti rotating protection (not Premium Light) ■ Air cleaning ■ Rust protected ■ Sealed 	 <ul style="list-style-type: none"> ■ Protective coating ■ 3 Clamping slides ■ Turbo function ■ Monitoring via air control ■ Anti rotating protection ■ Air cleaning ■ Stainless steel ■ Rust free ■ Sealed

Type	Clamping slides		Turbo	Pull-in forces with Turbo (without Turbo) kN	Anti rotating protection (for single use)	Air cleaning	Monitoring via air control	Protective coating
	3	2						
APS 100-E PREMIUM	-	●	●	15.0 (4)	●	●	●	●
APS 100-E BASIC	-	●	●	15.0 (4)	-	-	-	●
APS 140-E PREMIUM	●	-	●	26.0 (7.5)	●	●	●	●
APS 140-E PREMIUM LIGHT	●	-	●	26.0 (7.5)	-	●	-	●
APS 140-E PREMIUM INOX	●	-	●	26.0 (7.5)	●	●	●	●
APS 140-I PREMIUM	●	-	●	26.0 (7.5)	●	●	●	●
APS 140-E BASIC	-	●	●	26.0 (7.5)	-	-	-	●
APS 140-E BASIC INOX	-	●	●	26.0 (7.5)	-	-	-	●
APS 190-E PREMIUM	●	-	●	45.0 (13.5)	●	●	●	●

Machining Process with APS Zero Point Clamping System



Target: Batch size 1 → **Set up time 0**



Automation



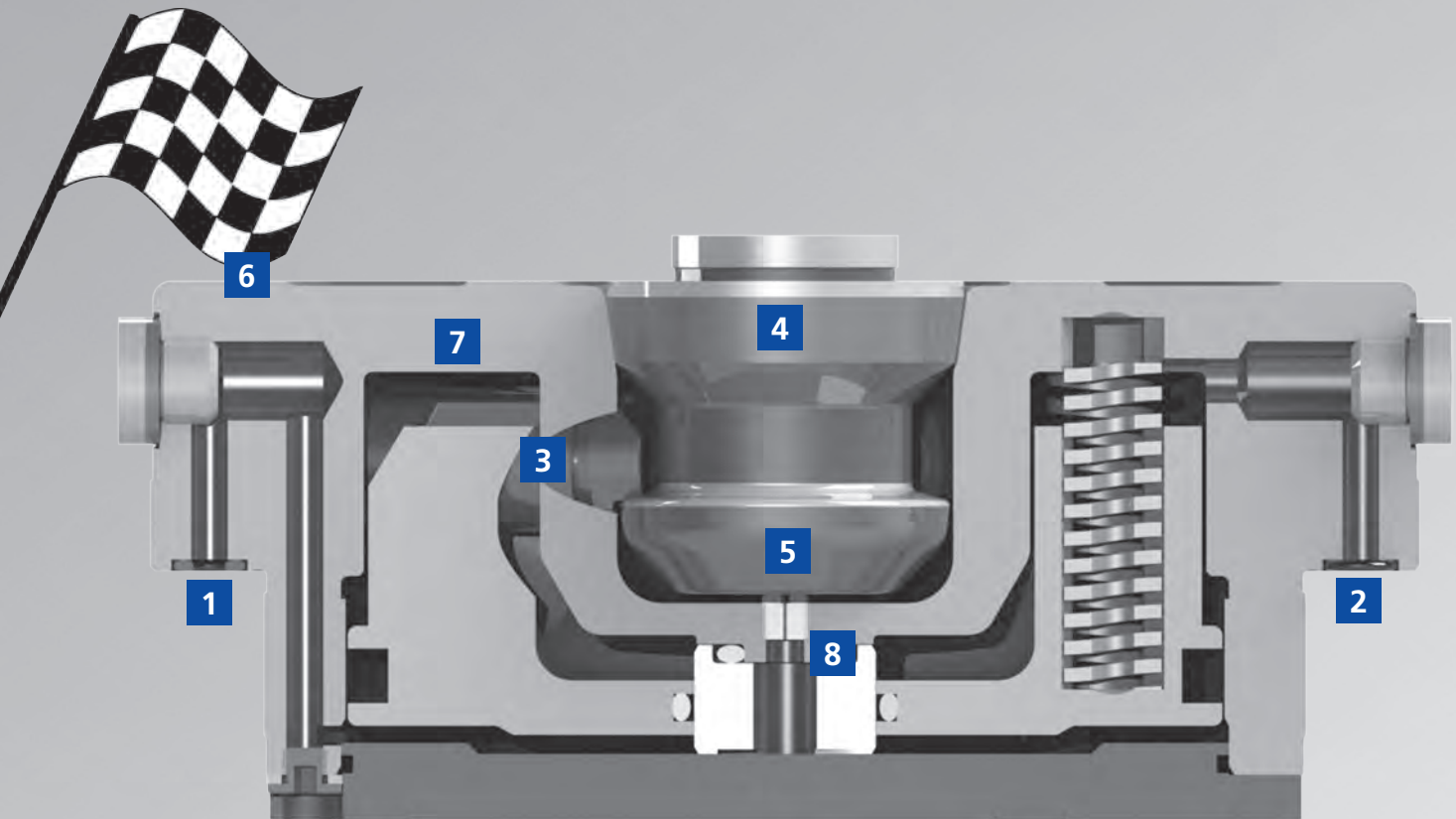
- Automation Product
- Manpower optimized production
- Cycle time reduced

Solution: APS Zero Point Clamping System in machining process

APS Zero Point Clamping System



Industry 4.0
Product



Functional Overview of the APS Zero Point Clamping System

- 1** Unlocking function
- 2** Turbo function for increasing the pull-in forces
- 3** 3 Clamping slides for maximum stiffness and protective coating (wear-resistant and rust protected)
- 4** Clamping pins with precise short taper centering and protective coating (wear-resistant and rust protected)
- 5** Large entry radii of the clamping pins for easy and safe loading
- 6** Large flat surface for highest stiffness
- 7** Hardened parts
- 8** Air cleaning

Clamping Pins

A: Centering Pin



■ Type A is used for centering and clamping.

B: Sword Pin



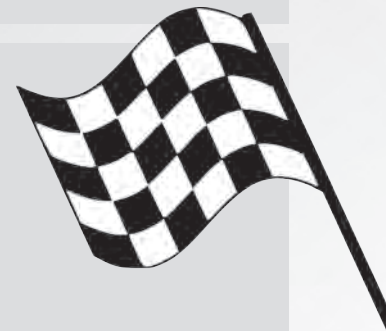
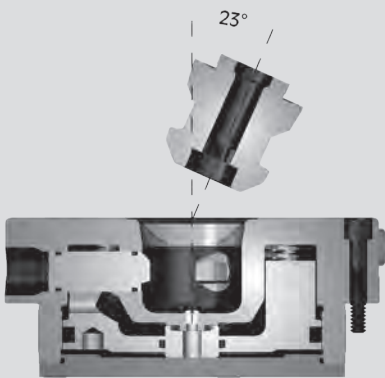
■ Type B is used for reference and clamping.

C: Clamping Pin

Centering Play 0.1 mm



■ Type C is only used for clamping.



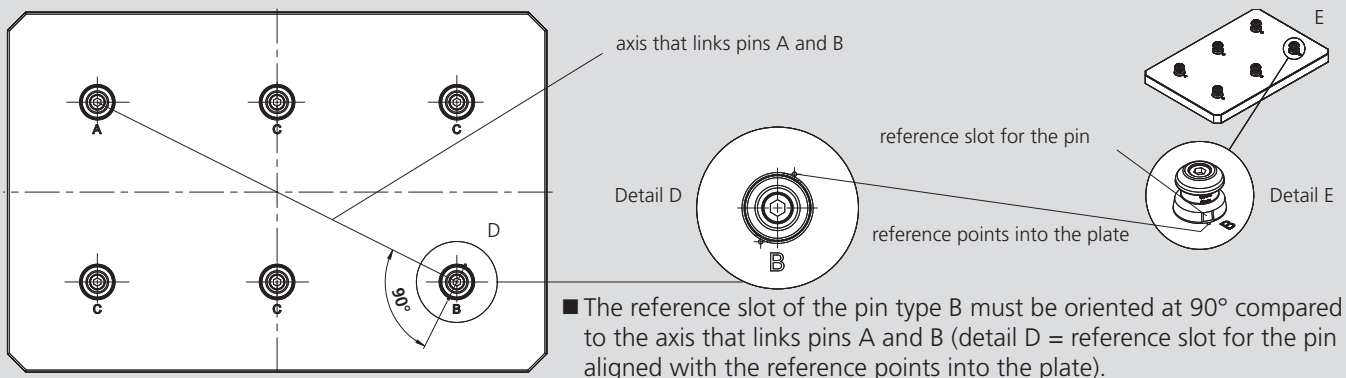
■ All clamping pins are wear-resistant and protected against rust. Large entry radii of the clamping pins ensure easy and safe loading.

Holding Forces (kN) with screw DIN EN ISO 4762 - 12.9

M6	M8	M10	M12	M16
15	25	35	50	75



Positioning of the Sword Pin Type B



- 2 clamping slides
- Turbo function

BASIC



Application/customer benefits

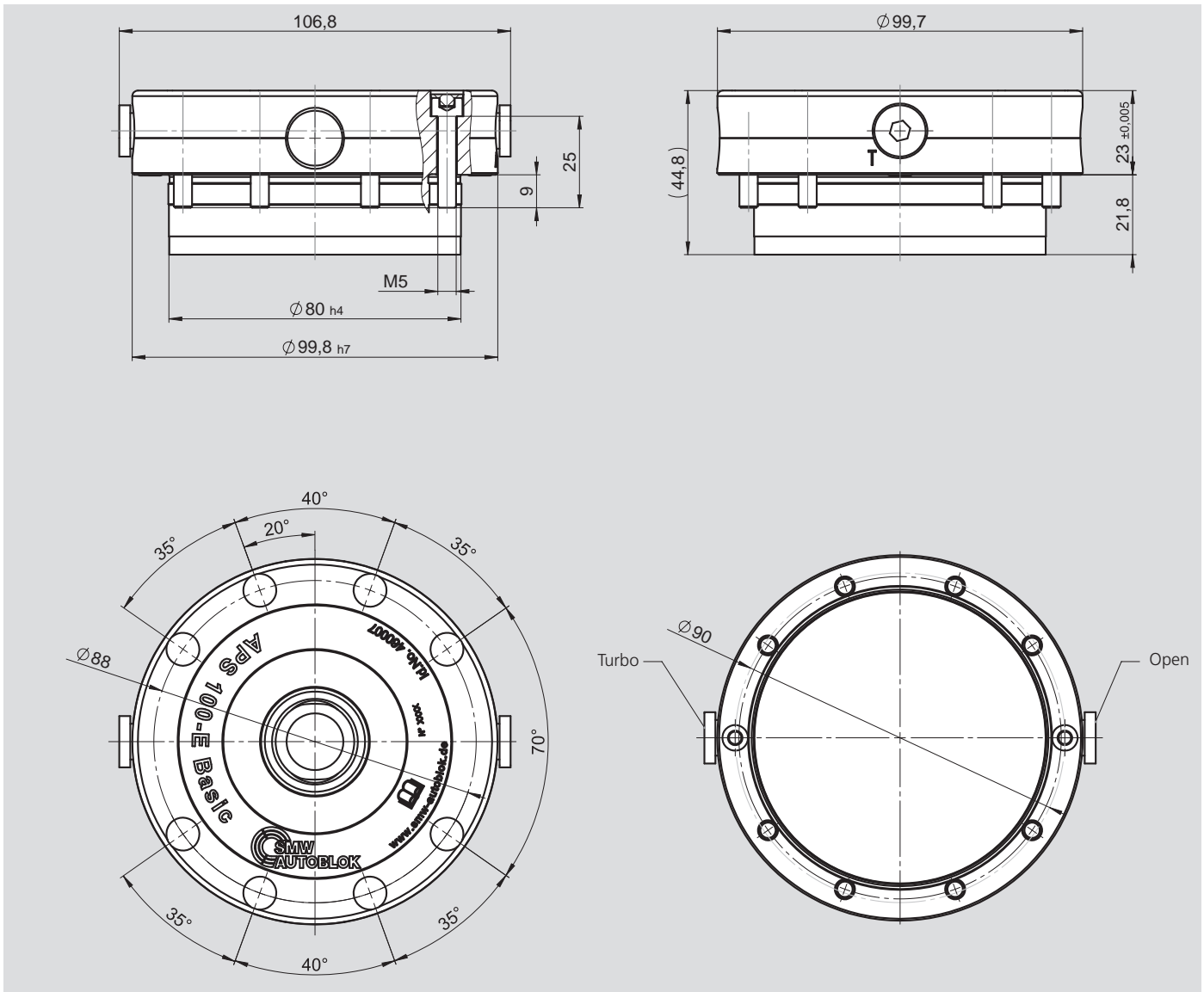
- Reduced set-up times
- Highest process reliability and repeat accuracy
- Wear-resistant and rust protected due to an extra hard protective coating
- Low maintenance
- Low installation height due to the compact design

Technical features

- 2 clamping slides
- Repeatability < 0.005 mm
- Protective coating
- Turbo function for increasing the pull-in forces (pull-in force without Turbo 4 kN)
- Fully sealed (proofline)

Standard equipment

Zero Point Clamping Module with mounting screws



Order review

Type	Id. No.	Pull-in force with Turbo	Holding force M6/M8	Unlocking pressure	Repeatability	Weight
APS 100-E BASIC	460007	15.0 kN	15 / 25 kN	6 bar	< 0.005 mm	1.9 kg

APS 100-E

Zero Point Clamping Module

PREMIUM

- 2 Clamping slides
- Turbo function



Application/customer benefits

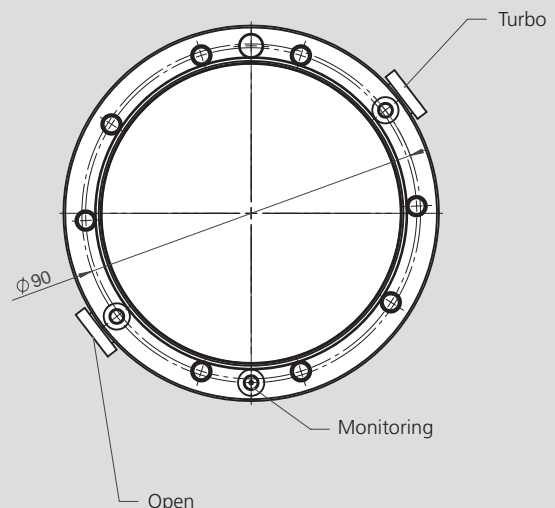
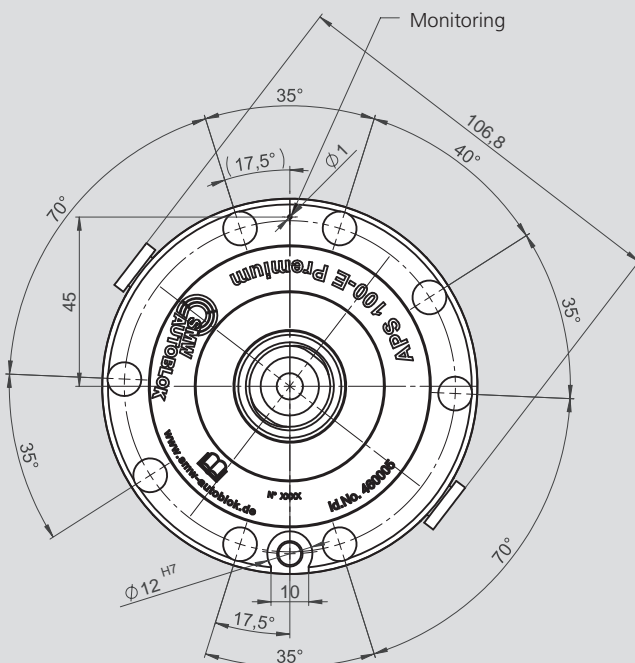
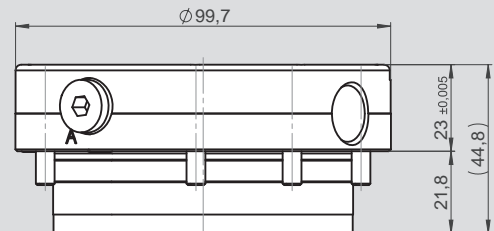
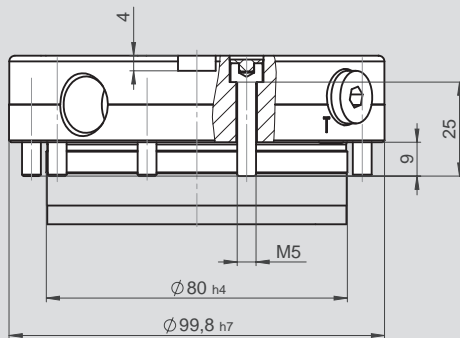
- Reduced set-up times
- Highest process reliability and repeat accuracy
- Wear-resistant and rust protected due to an extra hard protective coating
- Low maintenance
- Low installation height due to the compact design

Technical features

- 2 clamping slides
- Repeatability < 0.005 mm
- Protective coating
- Turbo function for increasing the pull-in forces (pull-in force without Turbo 4 kN)
- Anti rotating protection
- Monitoring via air control
- Air cleaning
- Fully sealed (proofline)

Standard equipment

Zero Point Clamping Module with mounting screws



Order review

Type	Id. No.	Pull-in force with Turbo	Holding force M6/M8	Unlocking pressure	Repeatability	Weight
APS 100-E PREMIUM	460005	15 kN	15 / 25 kN	6 bar	< 0.005 mm	1.9 kg

APS 140-E

Zero Point Clamping Module

BASIC

- 2 clamping slides
- Turbo function



Application/customer benefits

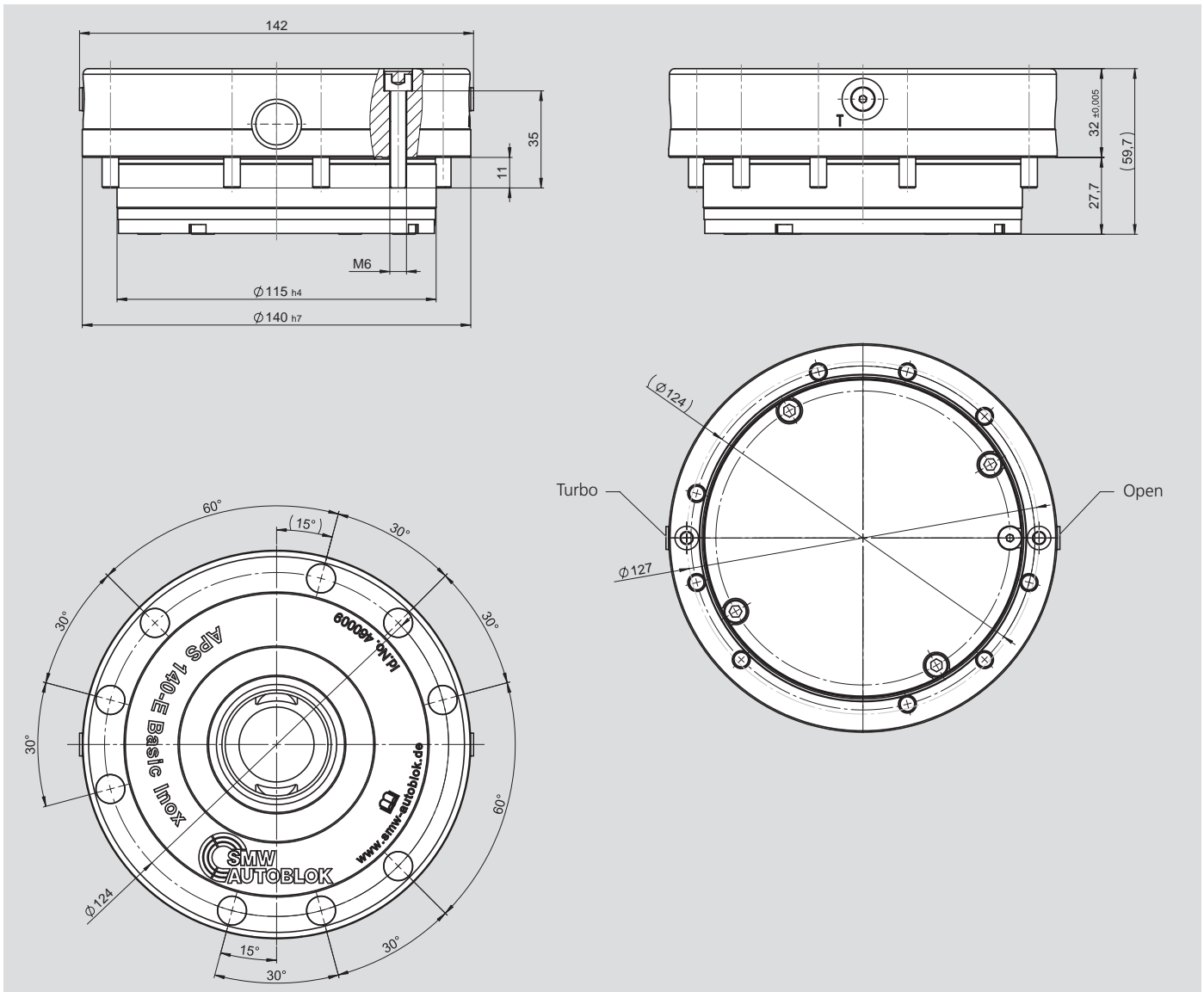
- Reduced set-up times
- Highest process reliability and repeat accuracy
- Wear-resistant and rust protected due to an extra hard protective coating
- Low maintenance
- Low installation height due to the compact design

Technical features

- 2 clamping slides
- Repeatability < 0.005 mm
- Protective coating
- Turbo function for increasing the pull-in forces (pull-in force without Turbo 7.5 kN)
- Fully sealed (proofline)

Standard equipment

Zero Point Clamping Module with mounting screws



Order review

Type	Id. No.	Pull-in force with Turbo	Holding force M10/M12/M16	Unlocking pressure	Repeatability	Weight
APS 140-E BASIC	460001	26 kN	35/50/75 kN	6 bar	< 0.005 mm	4.5 kg

APS 140-E

Zero Point Clamping Module

PREMIUM

- 3 Clamping slides
- Turbo function



Application/customer benefits

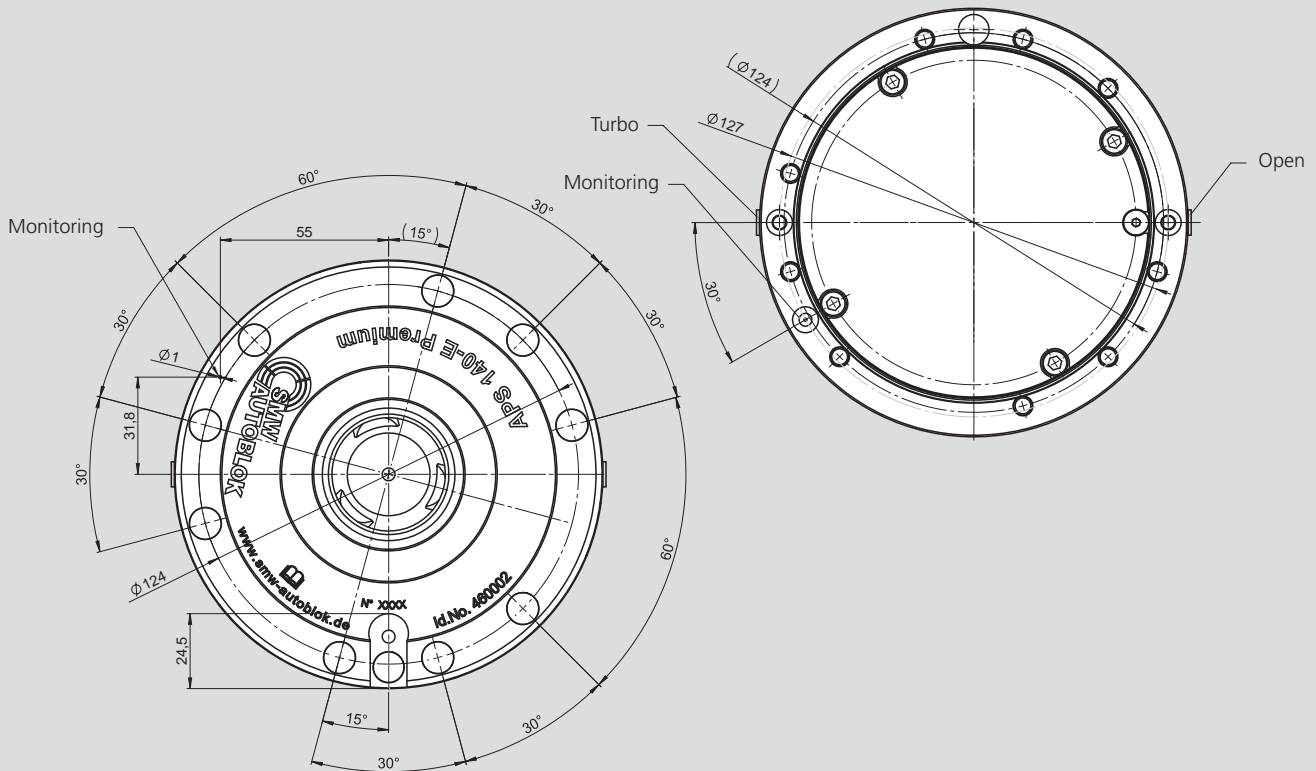
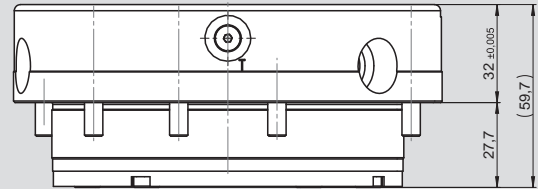
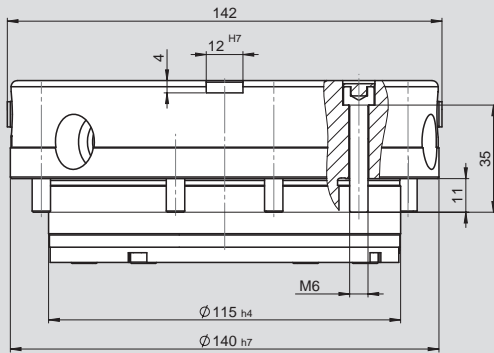
- Reduced set-up times
- Highest process reliability and repeat accuracy
- Wear-resistant and rust protected due to an extra hard protective coating
- Low maintenance
- Low installation height due to the compact design

Technical features

- 3 clamping slides
- Repeatability < 0.005 mm
- Protective coating
- Turbo function for increasing the pull-in forces (pull-in force without Turbo 7.5 kN)
- Anti rotating protection
- Monitoring via air control
- Air cleaning
- Fully sealed (proofline)

Standard equipment

Zero Point Clamping Module with mounting screws



Order review

Type	Id. No.	Pull-in force with Turbo	Holding force M10/M12/M16	Unlocking pressure	Repeatability	Weight
APS 140-E PREMIUM	460002	26 kN	35/50/75 kN	6 bar	< 0.005 mm	4.5 kg

- 3 Clamping slides
- Turbo function



Application/customer benefits

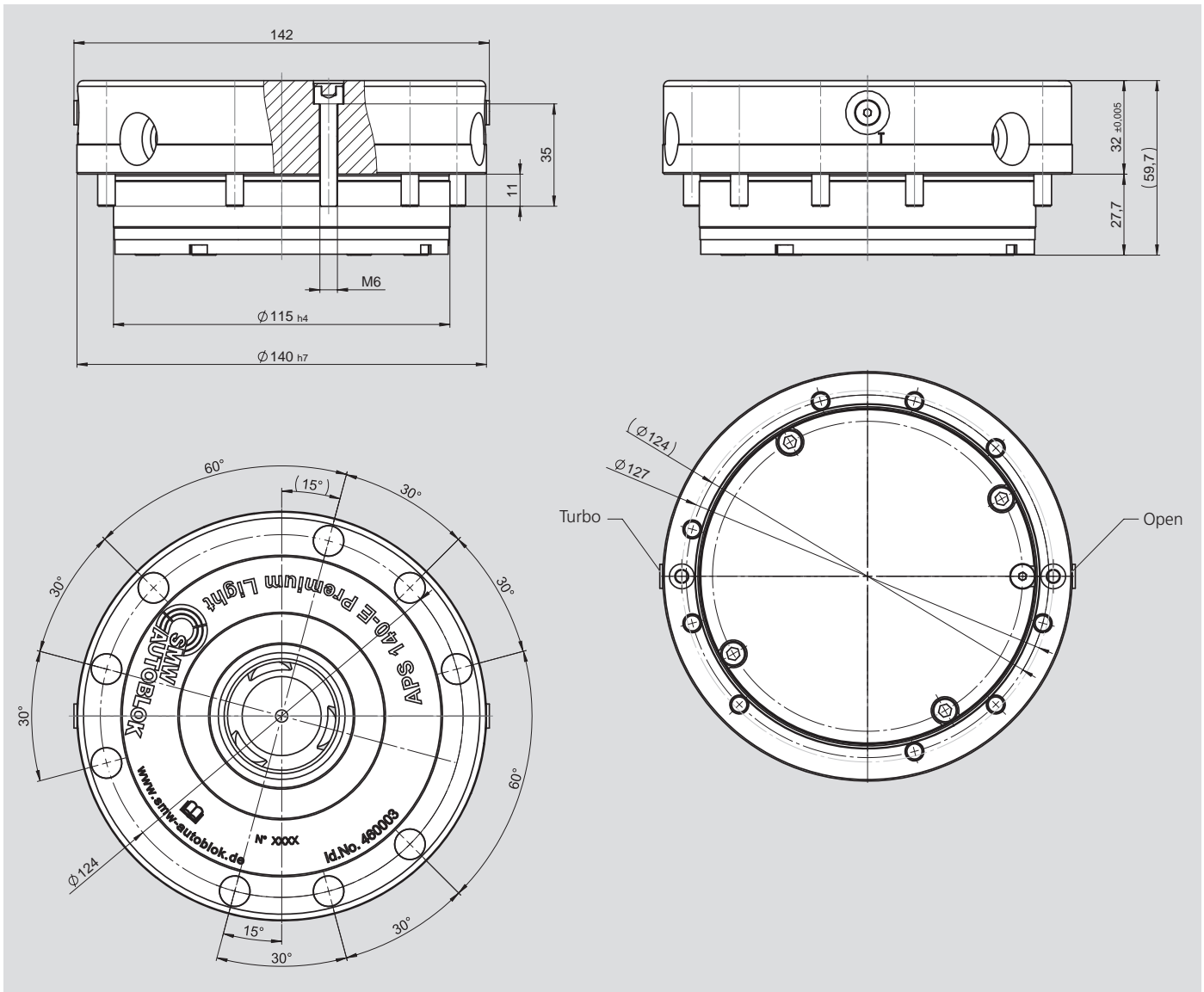
- Reduced set-up times
- Highest process reliability and repeat accuracy
- Wear-resistant and rust protected due to an extra hard protective coating
- Low maintenance
- Low installation height due to the compact design

Technical features

- 3 clamping slides
- Repeatability < 0.005 mm
- Protective coating
- Turbo function for increasing the pull-in forces (pull-in force without Turbo 7.5 kN)
- Air cleaning
- Fully sealed (proofline)

Standard equipment

Zero Point Clamping Module with mounting screws



Order review

Type	Id. No.	Pull-in force with Turbo	Holding force M10/M12/M16	Unlocking pressure	Repeatability	Weight
APS 140-E PREMIUM LIGHT	460003	26 kN	35/50/75 kN	6 bar	< 0.005 mm	4.5 kg

APS 140-E

Zero Point Clamping Module

PREMIUM INOX

- 3 Clamping slides
- Turbo function



Application/customer benefits

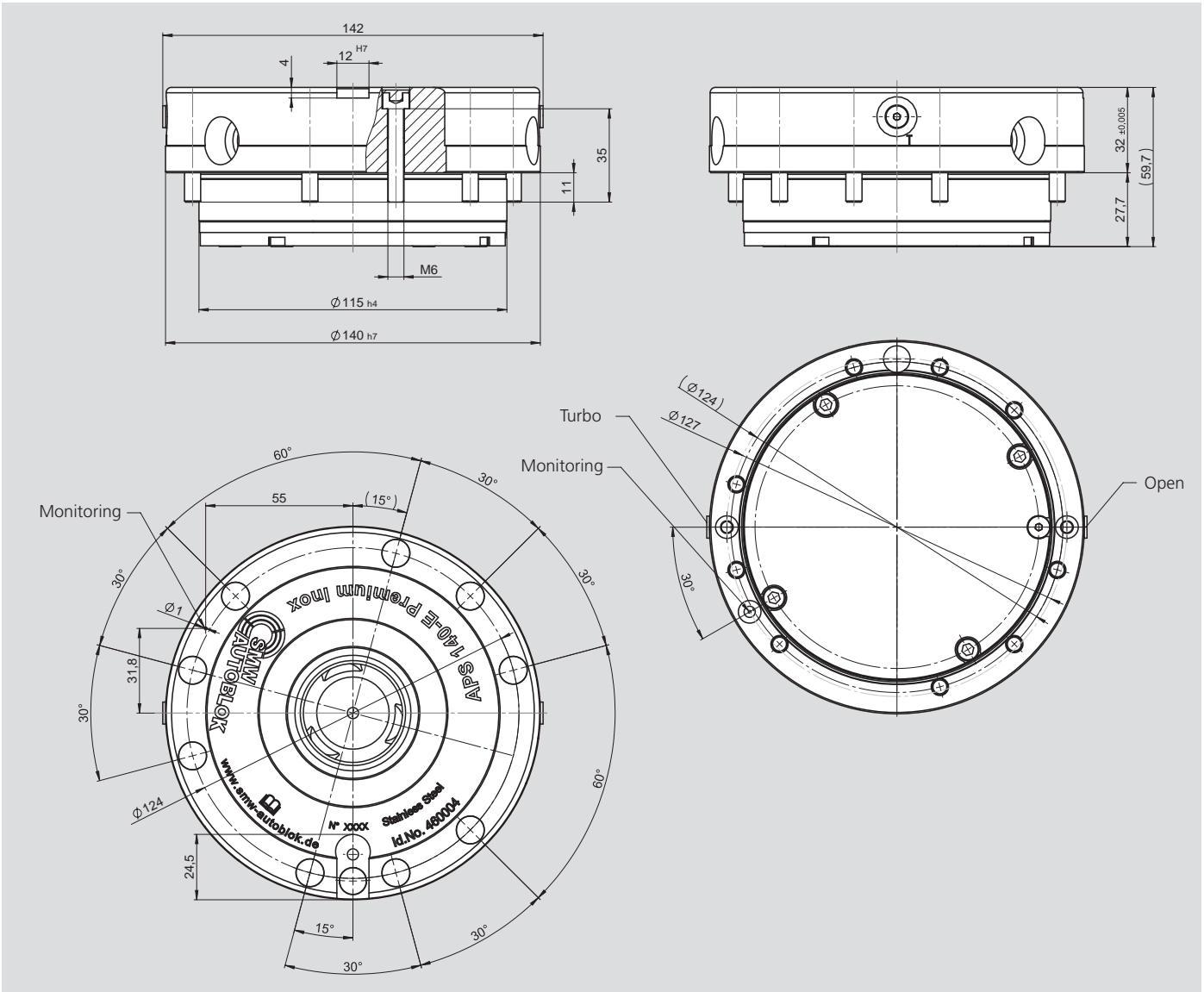
- Reduced set-up times
- Highest process reliability and repeat accuracy
- Wear-resistant and rust free due to an extra hard protective coating
- Low maintenance
- Low installation height due to the compact design

Technical features

- 3 clamping slides
- Repeatability < 0.005 mm
- Stainless steel version
- Turbo function for increasing the pull-in forces (pull-in force without Turbo 7.5 kN)
- Anti rotating protection
- Monitoring via air control
- Air cleaning
- Fully sealed (proofline)

Standard equipment

Zero Point Clamping Module with mounting screws



Order review

Type	Id. No.	Pull-in force with Turbo	Holding force M10/M12/M16	Unlocking pressure	Repeatability	Weight
APS 140-E PREMIUM INOX	460004	26 kN	35/50/75 kN	6 bar	< 0.005 mm	4.5 kg

- 3 Clamping slides
- Turbo function



Application/customer benefits

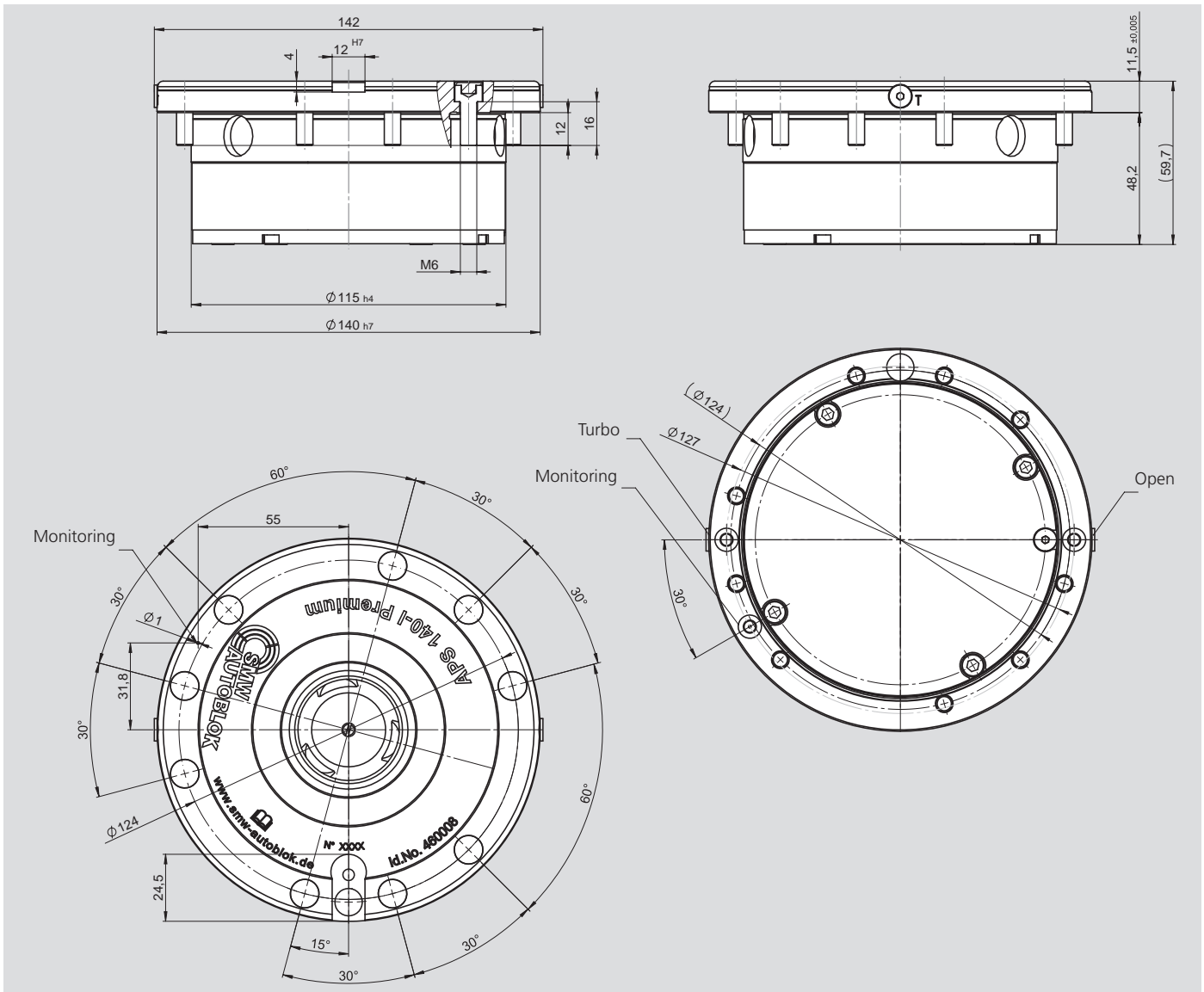
- Reduced set-up times
- Highest process reliability and repeat accuracy
- Wear-resistant and rust protected due to an extra hard protective coating
- Low maintenance
- Integration module for extra low installation height

Technical features

- 3 clamping slides
- Repeatability < 0.005 mm
- Protective coating
- Turbo function for increasing the pull-in forces (pull-in force without Turbo 7.5 kN)
- Anti rotating protection
- Monitoring via air control
- Air cleaning
- Fully sealed (proofline)

Standard equipment

Zero Point Clamping Module with mounting screws



Order review

Type	Id. No.	Pull-in force with Turbo	Holding force M10/M12/M16	Unlocking pressure	Repeatability	Weight
APS 140-I PREMIUM	460008	26 kN	35/50/75 kN	6 bar	< 0.005 mm	4.5 kg

APS 190-E

Zero Point Clamping Module

PREMIUM

- 3 Clamping slides
- Turbo function



Application/customer benefits

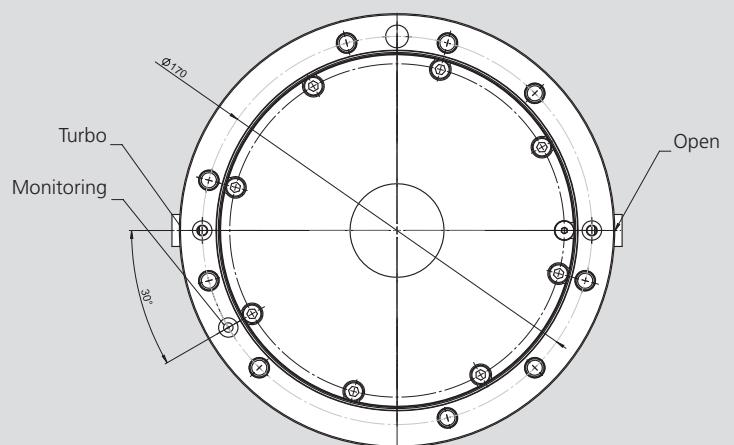
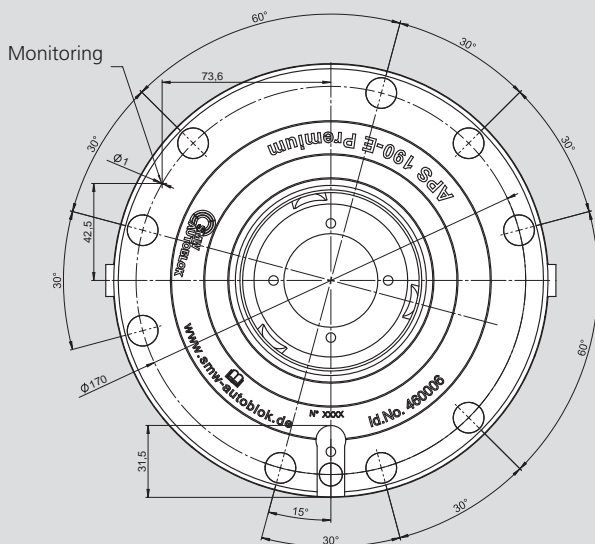
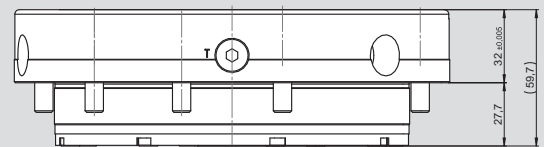
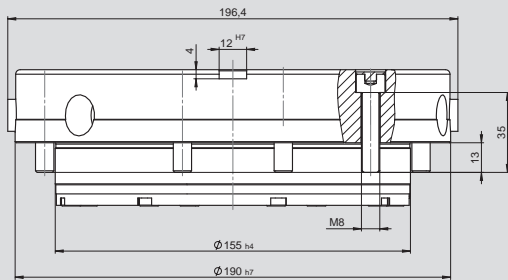
- Reduced set-up times
- Highest process reliability and repeat accuracy
- Wear-resistant and rust protected due to an extra hard protective coating
- Low maintenance
- Low installation height due to the compact design

Technical features

- 3 clamping slides
- Repeatability < 0.005 mm
- Protective coating
- Turbo function for increasing the pull-in forces (pull-in force without Turbo 13.5 kN)
- Anti rotating protection
- Monitoring via air control
- Air cleaning
- Fully sealed (proofline)

Standard equipment

Zero Point Clamping Module with mounting screws



Order review

Type	Id. No.	Pull-in force with Turbo	Holding force M12/M16	Unlocking pressure	Repeatability	Weight
APS 190-E PREMIUM	460006	45 kN	50/75 kN	6 bar	< 0.005 mm	6.9 kg



Type A

Type B

Type C

Application/customer benefits

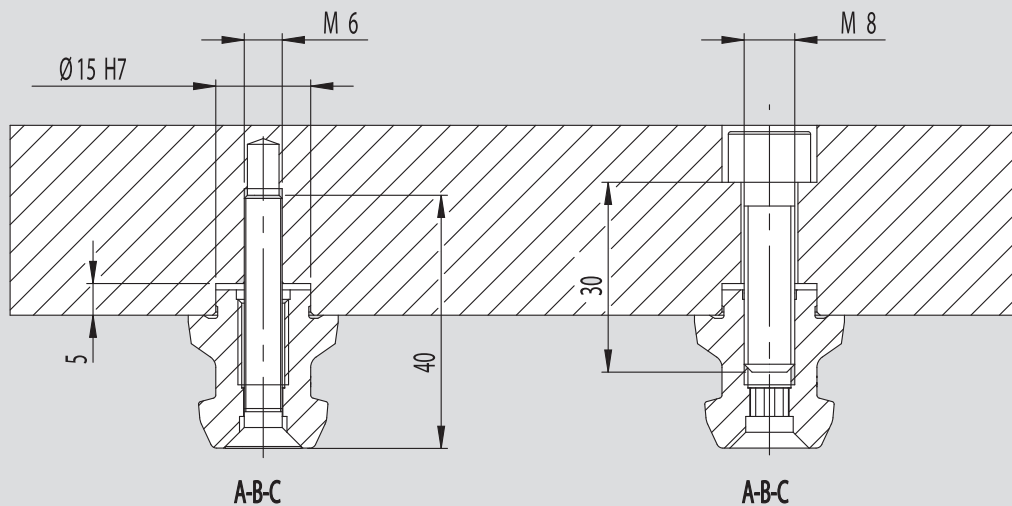
- Fixation and positioning on the clamping systems APS 100
- Wear-resistant due to an extra hard protective coating
- Large entry radii of the clamping pins for easy and safe loading

Technical features

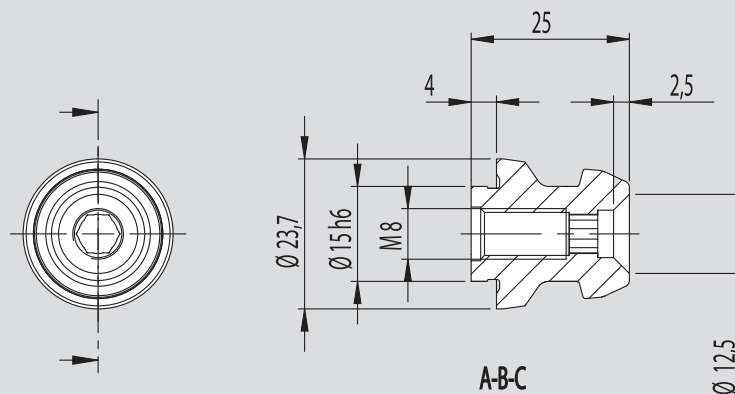
- Centering pin Type A (Standard)
- Sword pin Type B (Positioning pin)
- Clamping pin Type C (with centering play 0.1 mm)

Standard equipment

Clamping pin



ISO 10642 M6x35



Order review

Type	Thread	Type A Id. No.	Type B Id. No.	Type C Id. No.	Weight kg
Clamping pin APS 100	M8	46162155	46162156	46162157	0.3



Type A

Type B

Type C

Application/customer benefits

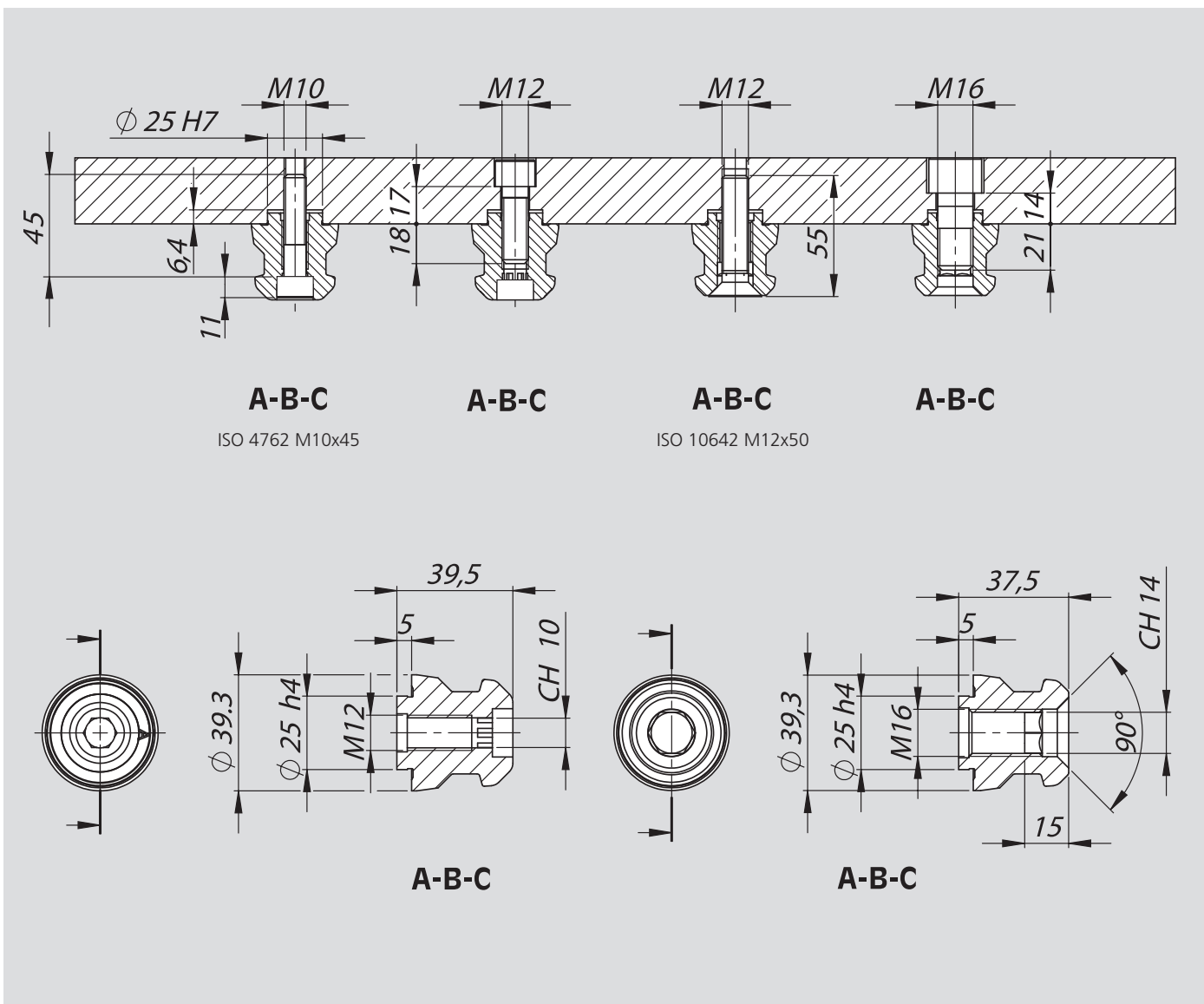
- Fixation and positioning on the clamping systems APS 140
- Wear-resistant due to an extra hard protective coating
- Large entry radii of the clamping pins for easy and safe loading

Technical features

- Centering pin Type A (Standard)
- Sword pin Type B (Positioning pin)
- Clamping pin Type C (with centering play 0.1 mm)

Standard equipment

Clamping pin



Order review

Type	Thread	Type A Id. No.	Type B Id. No.	Type C Id. No.	Weight kg
Clamping pin APS 140	M12	46162355	46162356	46162357	0.3
Clamping pin APS 140	M16	46162455	46162456	46162457	0.3



Application/customer benefits

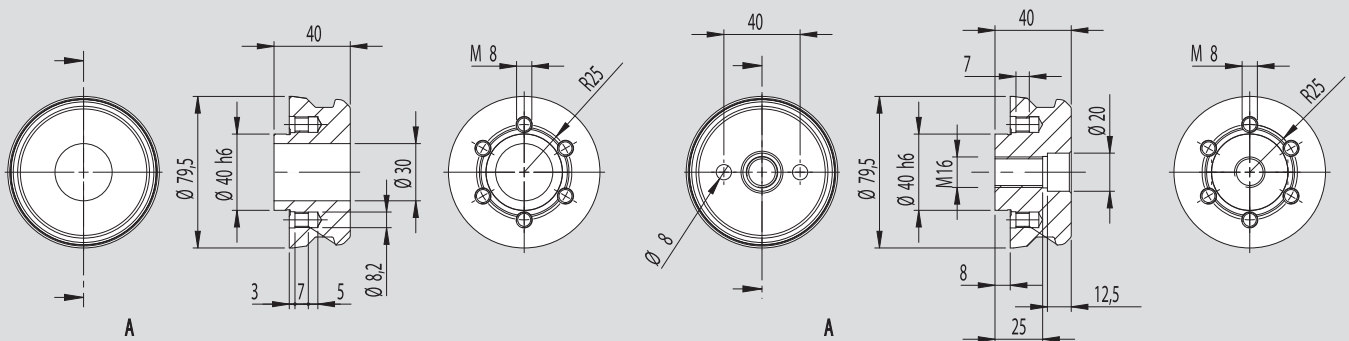
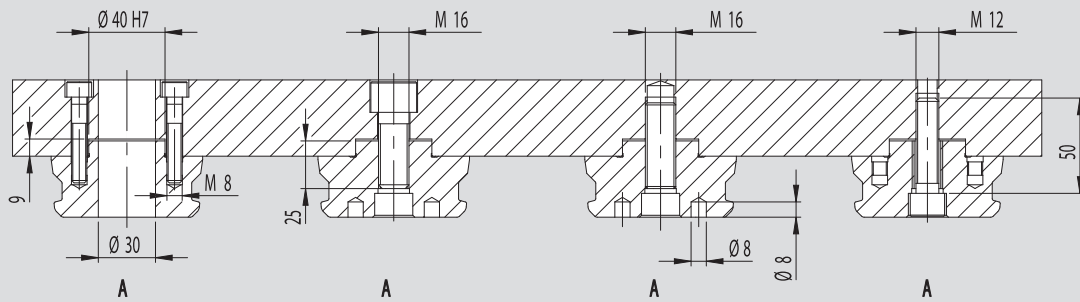
- Fixation and positioning on the clamping systems APS 190
- Large entry radii of the clamping pins for easy and safe loading

Technical features

- Centering pin Type A (Standard)

Standard equipment

Clamping pin



Order review

Type	Version	Type A Id. No.	Weight kg
Clamping pin APS 190	Ø30	46162608	0.4
Clamping pin APS 190	M16	46162615	0.4



Application/customer benefits

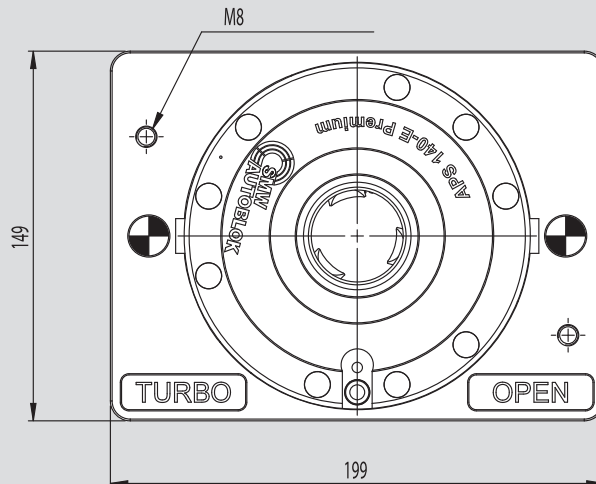
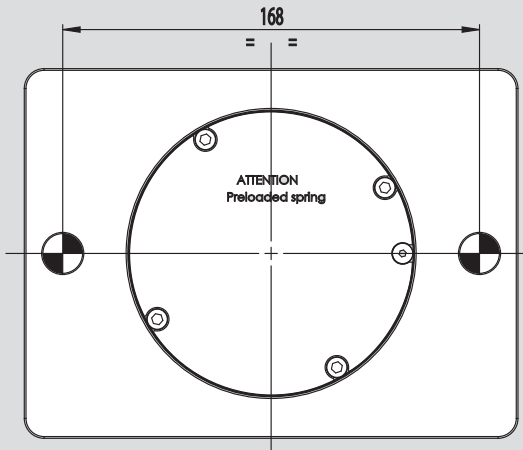
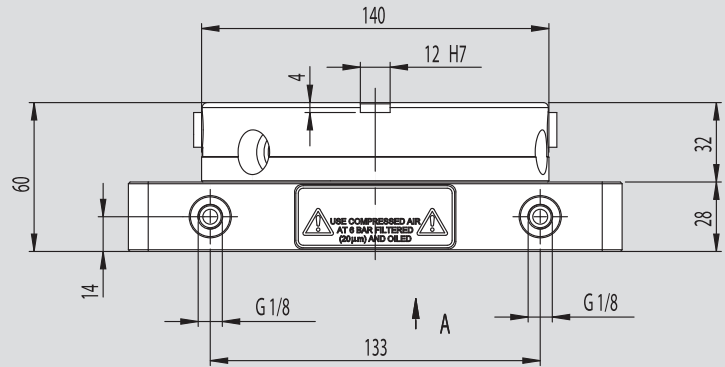
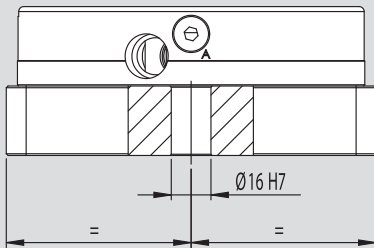
- Pre-assembled clamping unit with APS 140 Premium
- Universal applicable
- Fast and easy set-up

Technical features

- 3 clamping slides
- Repeatability < 0.005 mm
- Protective coating
- Turbo function for increasing the pull-in forces (pull-in force without Turbo 7.5 kN)
- Anti rotating protection
- Monitoring via air control
- Air cleaning

Standard equipment

Clamping unit with APS 140 Premium



Order review

Type	Id. No.	Pull-in force with Turbo kN	Holding force M10/M12/M16 kN	Repeatability mm	Weight kg
Clamping unit with 1 APS 140 Premium	460019	26	35/50/75	< 0.005	11



Application/customer benefits

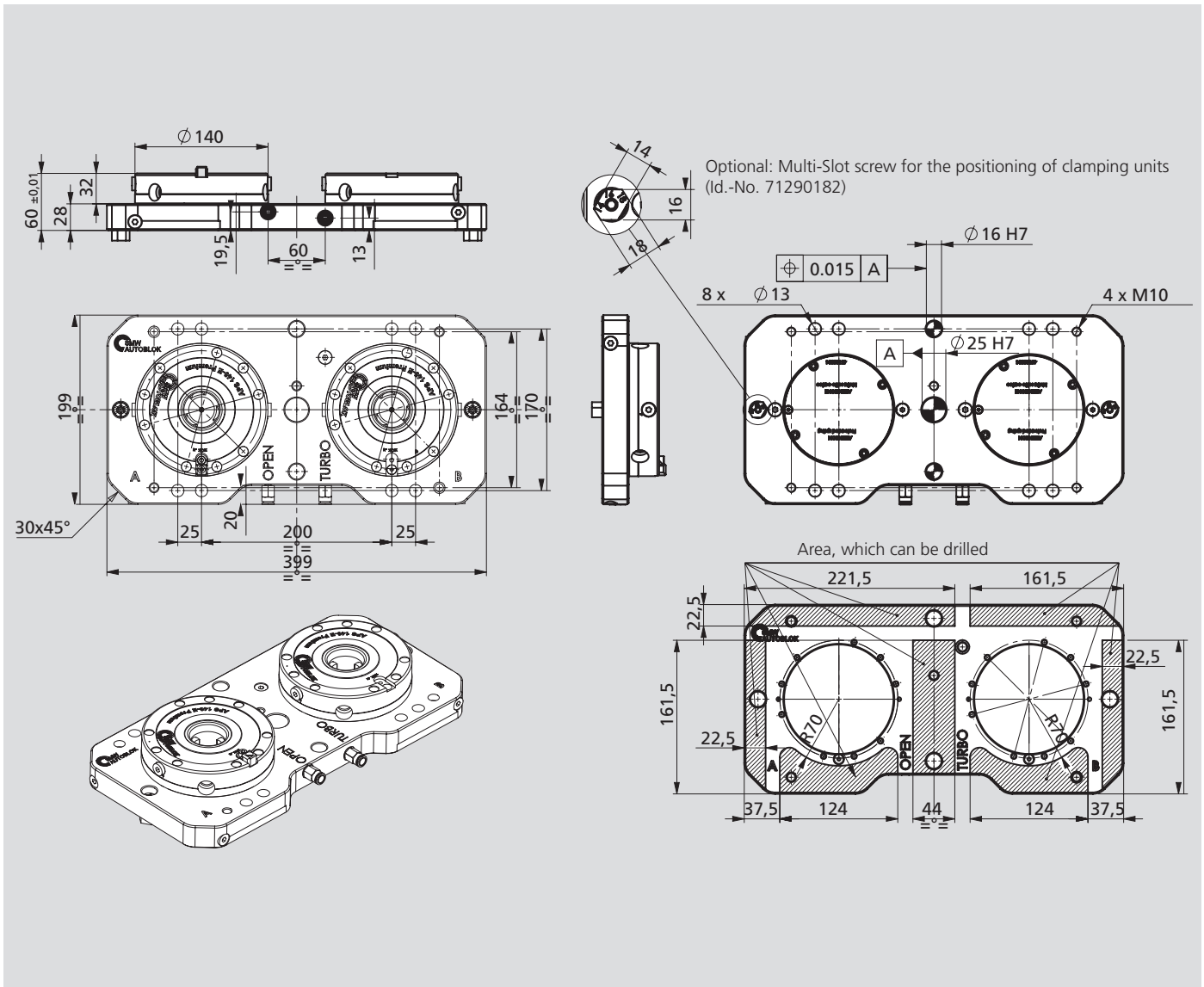
- Pre-assembled clamping unit with 2 pieces APS 140 Premium Light or Basic
- Universal applicable
- Fast and easy set-up

Technical features

- 3 Clamping slides (Basic: 2 Clamping slides)
- Repeatability < 0.005 mm
- Protective coating
- Turbo function for increasing the pull-in forces (pull-in force without Turbo 7.5 kN)
- Air cleaning (only Premium Light)
- Grid dimension 200 mm

Standard equipment

Clamping unit with 2 pieces APS 140 Premium Light or Basic



Order review

Type	Id. No.	Pull-in force with Turbo kN	Holding force M10/M12/M16 kN	Repeatability mm	Weight kg
Clamping unit with 2 APS 140 Premium Light	460020	26	35/50/75	< 0.005	28
Clamping unit with 2 APS 140 Basic	460021	26	35/50/75	< 0.005	28



Application/customer benefits

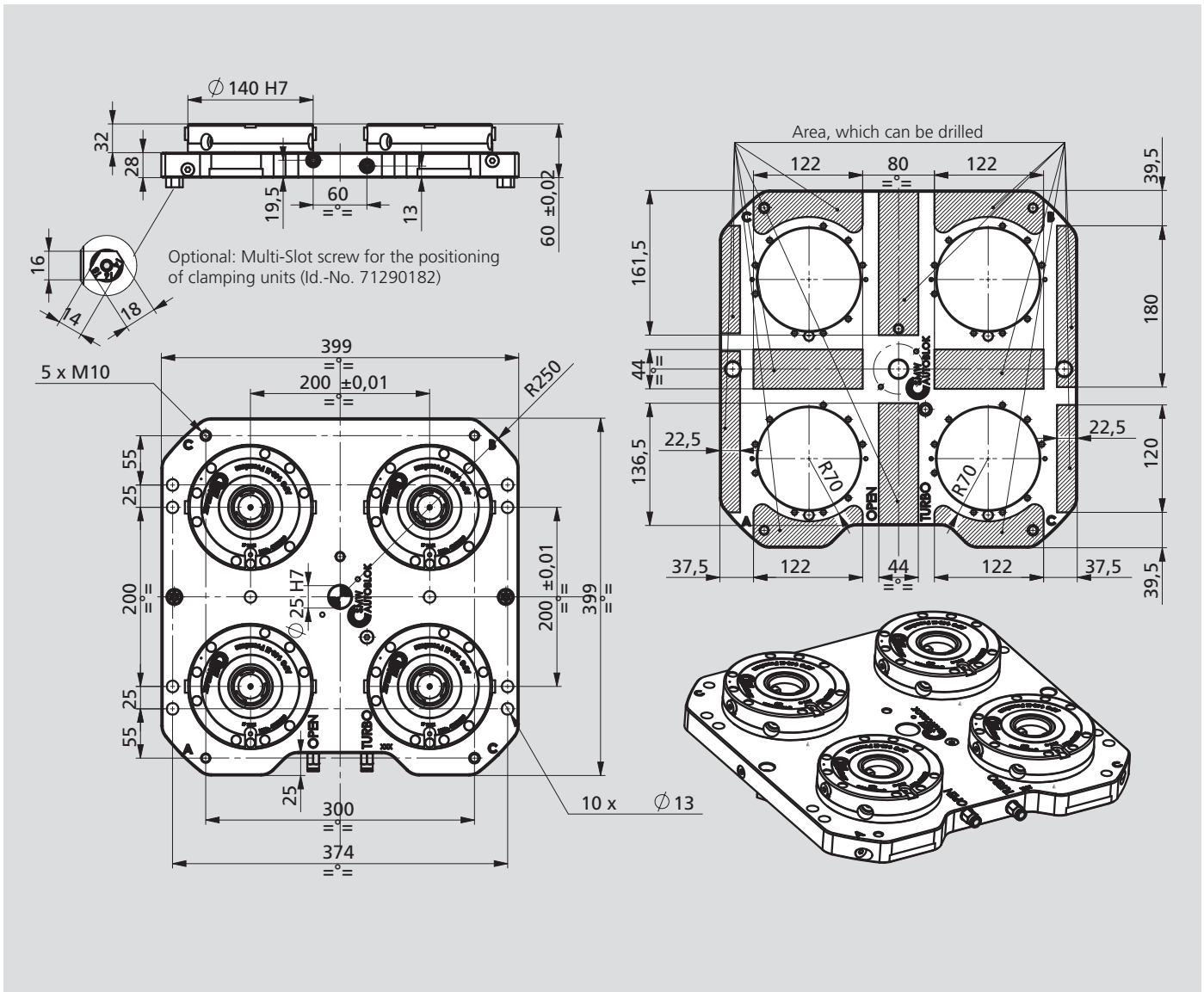
- Pre-assembled clamping unit with 4 pieces APS 140 Premium Light or Basic
- Universal applicable
- Fast and easy set-up

Technical features

- 3 Clamping slides (Basic: 2 Clamping slides)
- Repeatability < 0.005 mm
- Protective coating
- Turbo function for increasing the pull-in forces (pull-in force without Turbo 7.5 kN)
- Air cleaning (only Premium Light)
- Grid dimension 200 mm

Standard equipment

Clamping unit with 4 pieces APS 140 Premium Light or Basic



Order review

Type	Id. No.	Pull-in force with Turbo kN	Holding force M10/M12/M16 kN	Repeatability mm	Weight kg
Clamping unit with 4 APS 140 Premium Light	460022	26	35/50/75	< 0.005	56
Clamping unit with 4 APS 140 Basic	460023	26	35/50/75	< 0.005	56



Application/customer benefits

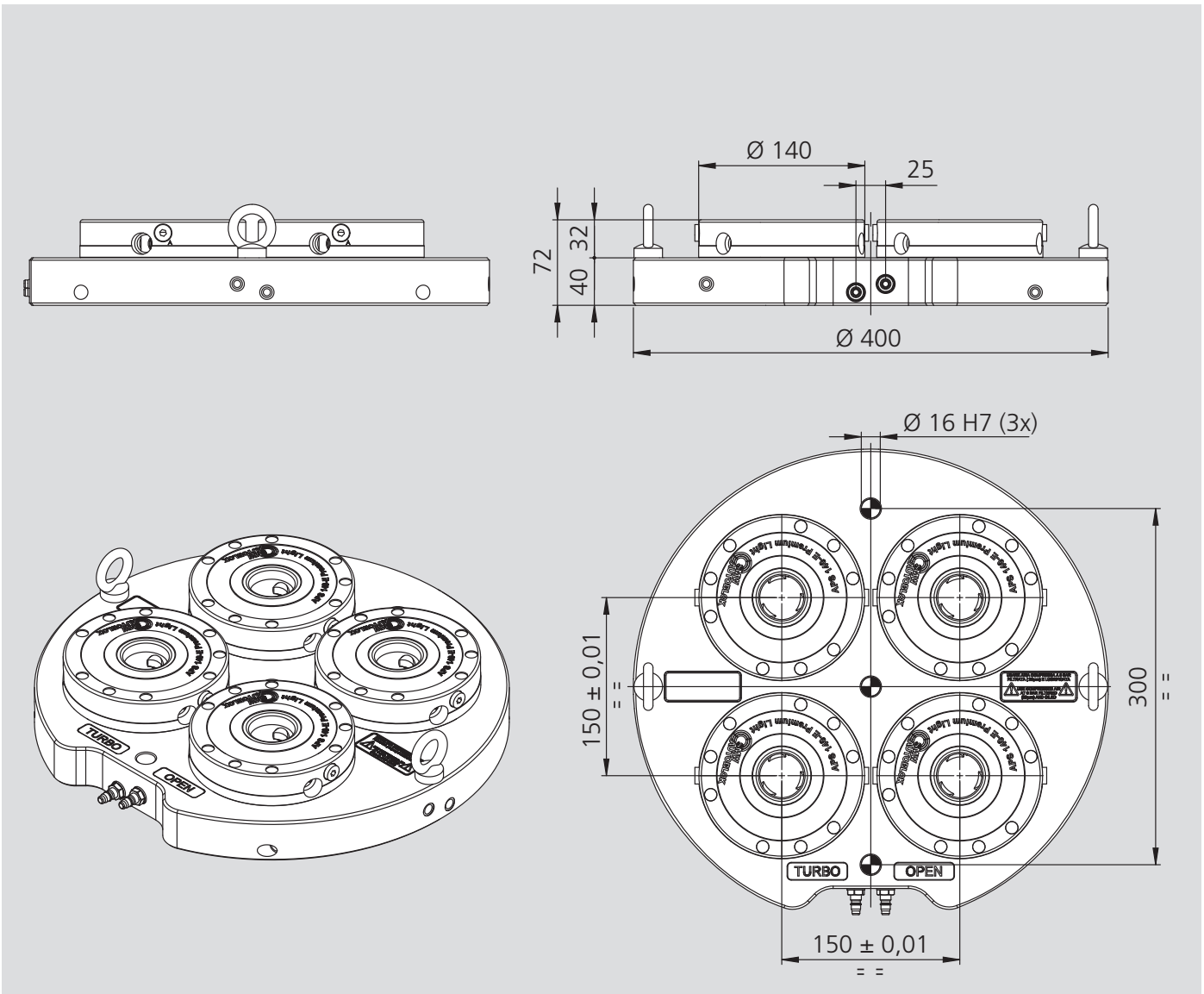
- Pre-assembled clamping unit with 4 pieces APS 140 Premium Light or Basic
- Universal applicable
- Fast and easy set-up

Technical features

- 3 Clamping slides (Basic: 2 Clamping slides)
- Repeatability < 0.005 mm
- Protective coating
- Turbo function for increasing the pull-in forces (pull-in force without Turbo 7.5 kN)
- Air cleaning (only Premium Light)
- Grid dimension 150 mm

Standard equipment

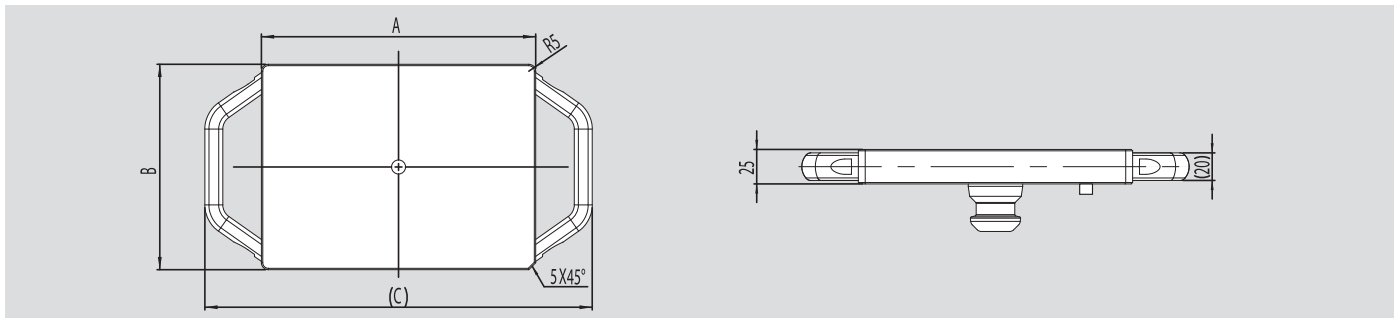
Clamping unit with 4 pieces APS 140 Premium Light or Basic



Order review

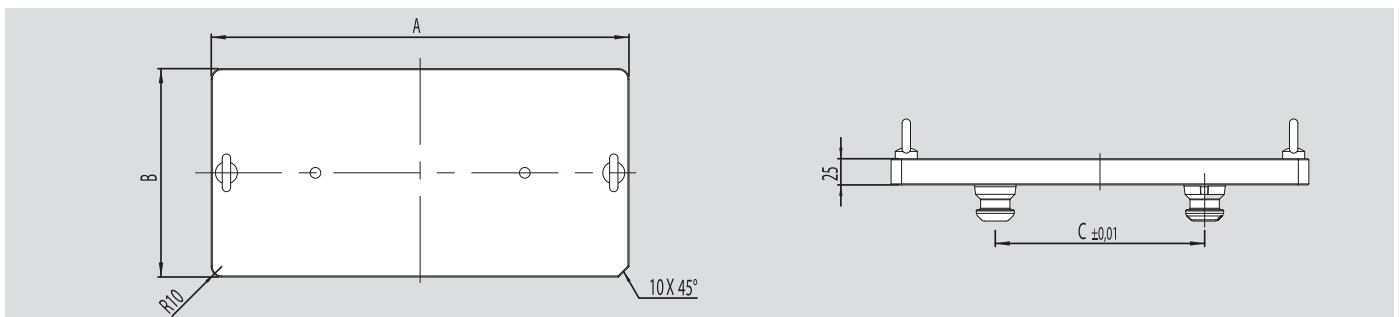
Type	Id. No.	Pull-in force with Turbo kN	Holding force M10/M12/M16 kN	Repeatability mm	Weight kg
Clamping unit with 4 APS 140 Premium Light	460024	26	35/50/75	< 0.005	45
Clamping unit with 4 APS 140 Basic	460025	26	35/50/75	< 0.005	45

Clamping pallet with 1 clamping pin Type A and anti rotating key



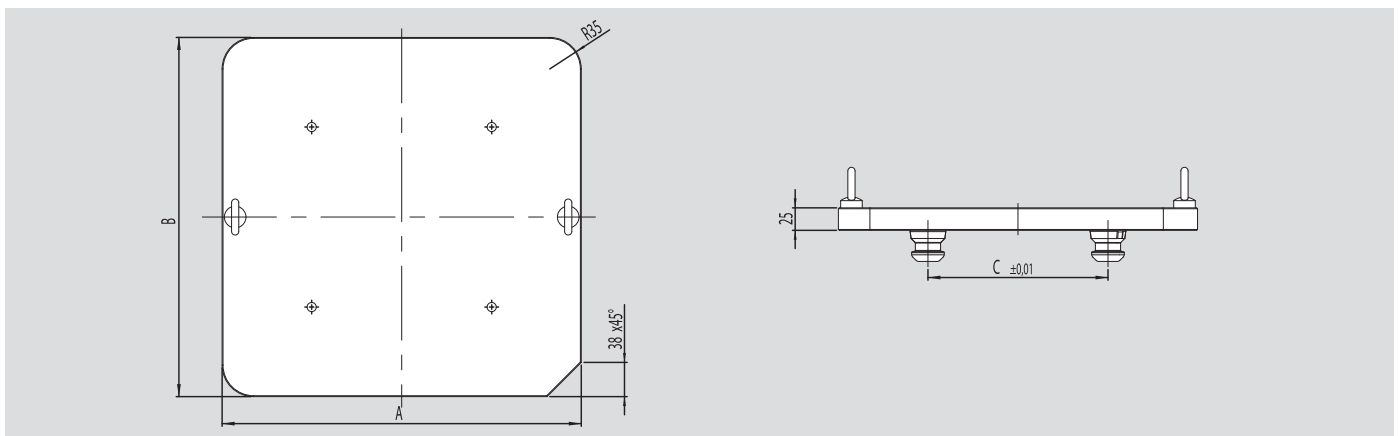
Type	Id. No.	A mm	B mm	C mm
APS 140	460016	199	149	281

Clamping pallet with 1 clamping pin Type A and 1 Clamping pin Type B



Type	Id. No.	A mm	B mm	C mm
APS 140	460017	399	199	200

Clamping pallet with 1 clamping pin Type A and 1 Clamping pin Type B and 2 clamping pins Type C



Type	Id. No.	A mm	B mm	C mm
APS 140	460018	399	399	200



Application/customer benefits

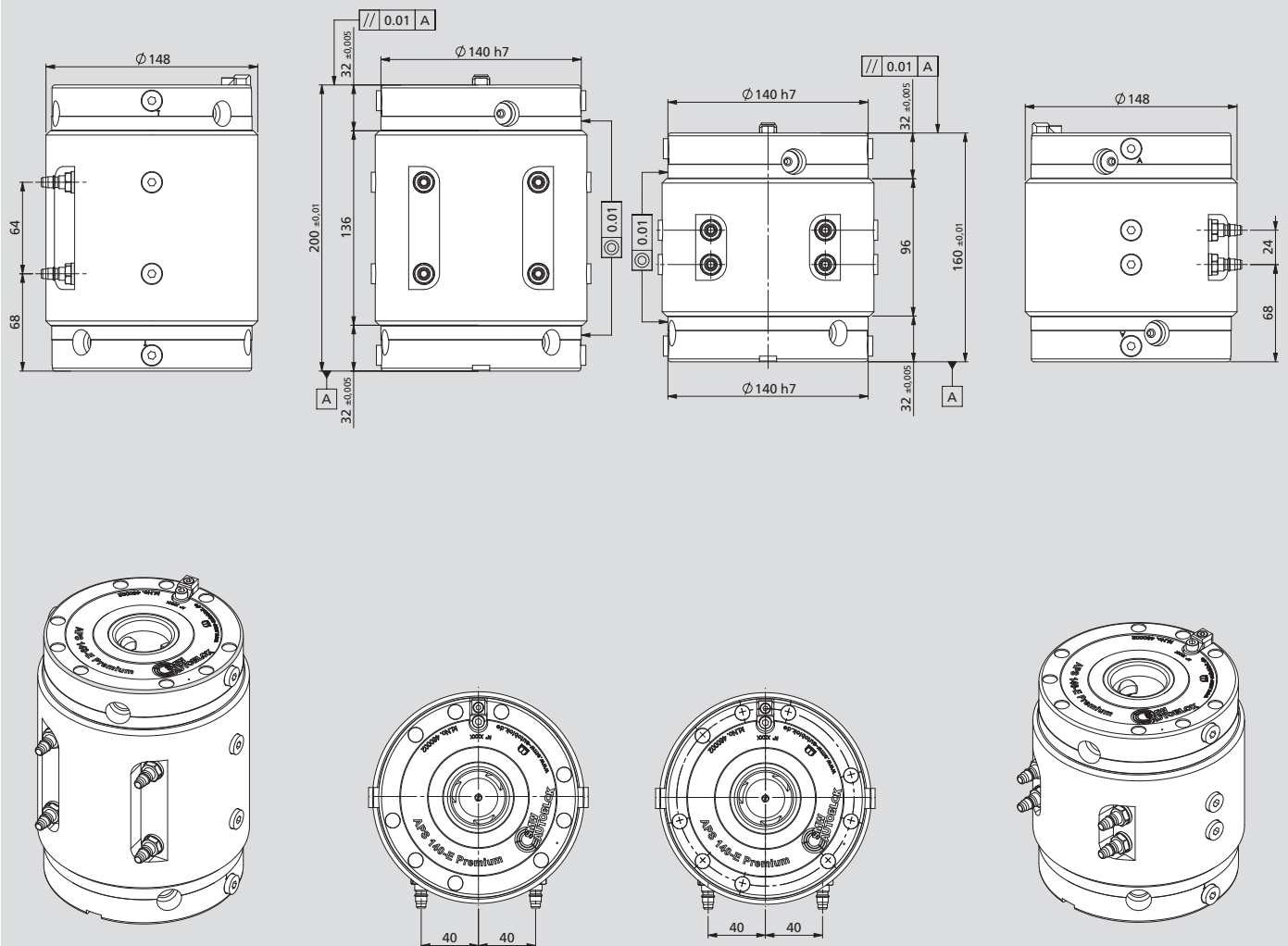
- Pre-assembled clamping unit with 2 pieces APS 140 Premium
- Universal applicable
- Fast and easy set-up

Technical features

- 3 Clamping slides
- Repeatability < 0.005 mm
- Protective coating
- Turbo function for increasing the pull-in forces (pull-in force without Turbo 7.5 kN)
- Anti rotating protection
- Monitoring via air control
- Air cleaning

Standard equipment

Clamping unit with 2 pieces APS 140 Premium



Order review

Type	Id. No.	Height mm	Weight kg
Combi unit with 2 pieces APS 140 Premium	460120	200	21
Combi unit with 2 pieces APS 140 Premium	460119	160	17



Application/ customer benefits

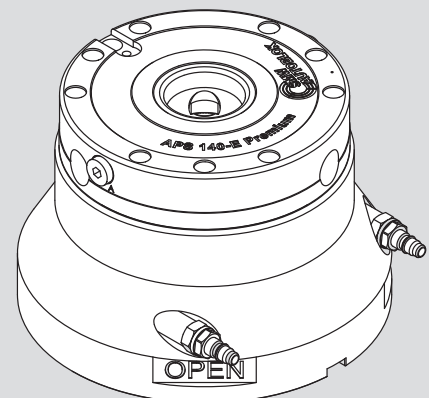
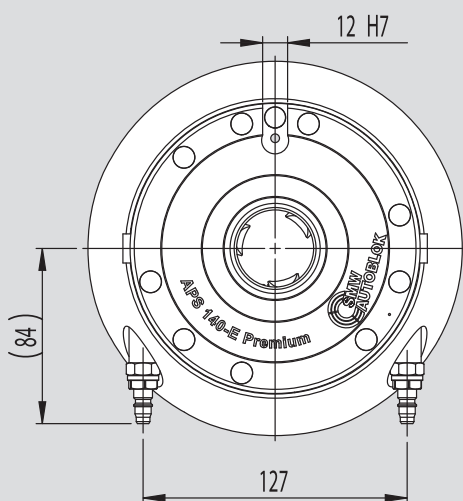
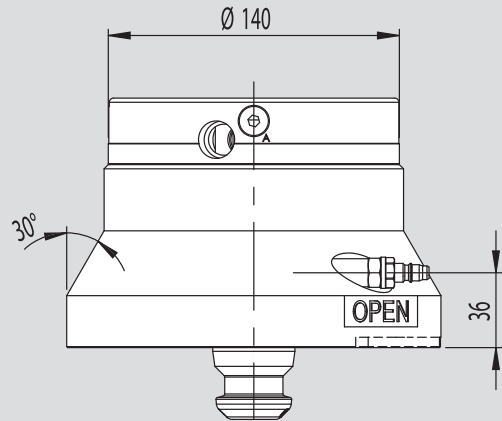
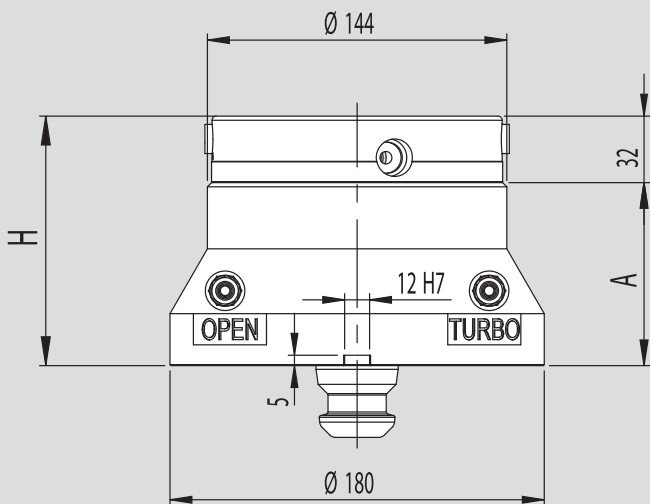
- Pre-assembled module extension unit with 1 pieces APS 140 Premium
- Universal applicable
- Fast and easy set-up

Technical features

- 3 Clamping slides
- Repeatability < 0.005 mm
- Protective coating
- Turbo function for increasing the pull-in forces
- Anti rotating protection
- Monitoring via air control
- Air cleaning

Standard equipment

Module height extension with 1 piece APS 140 Premium and 1 piece clamping pin type A



Ordernumbers

Type	Id. No.	A mm	H mm	Weight
Kombi with 1 piece APS 140 Premium	460038	88	120	-
Kombi with 1 piece APS 140 Premium	460039	148	180	-

Protection cover



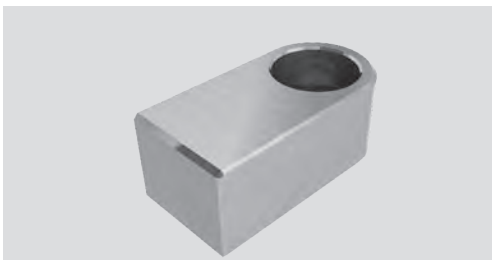
Type	Id. No.
APS 100	460030
APS 140	460031

Pin for orientation (single use)



Type	Id. No.
APS 100	460032
APS 140	460033

Key for single use

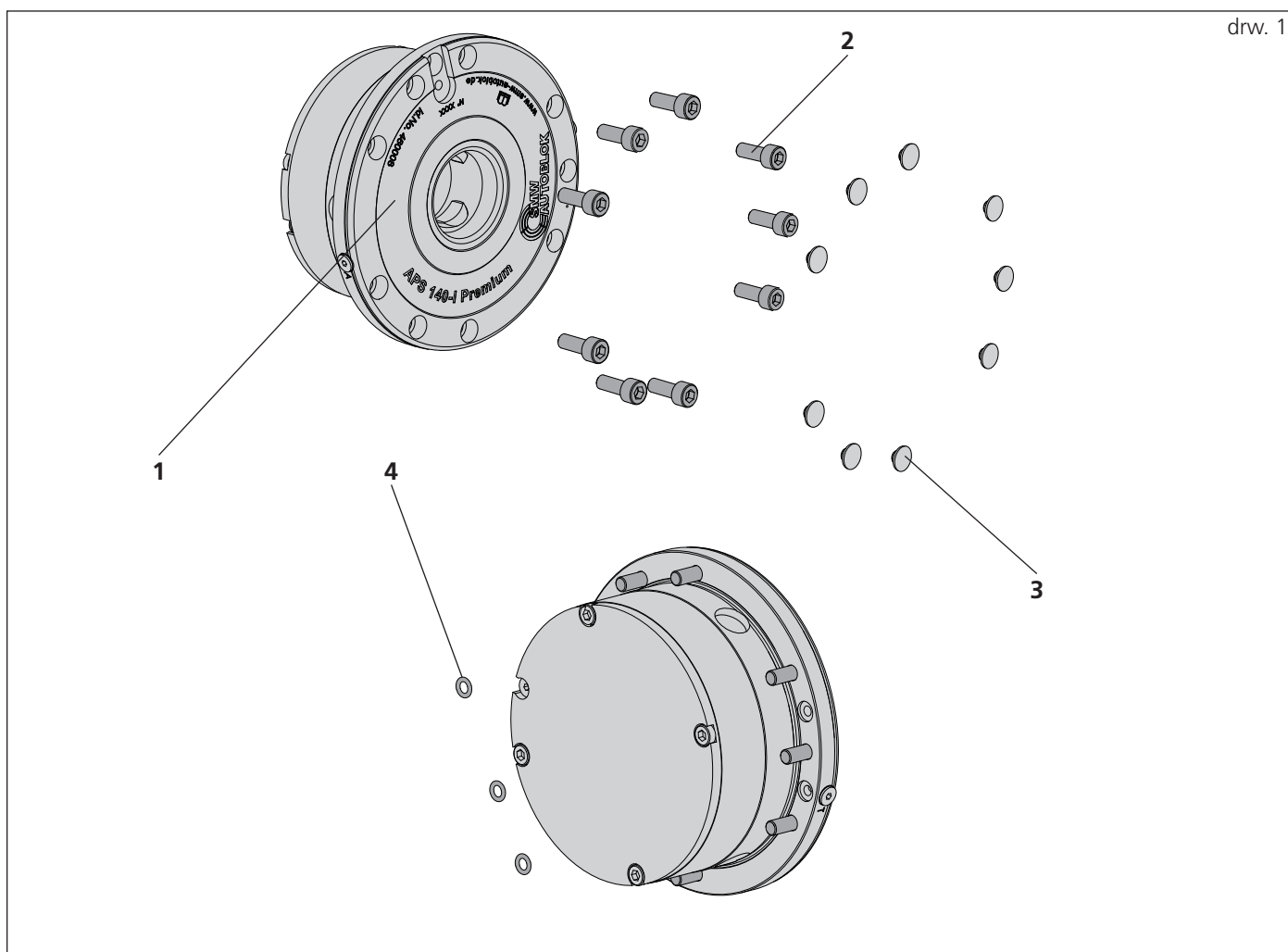


Type	Id. No.
APS 100	460034
APS 140	460035

1. COMPOSITION OF THE SUPPLY

The APS Module are supplied with these code:

SMW-AUTOBLOK Type	Qty.	Module (Pos. 1)	Screws (Pos. 2)	Caps (Pos. 3)	O-ring (Pos. 4)
APS 100 E PREMIUM	Piece	1	8	8	3
APS 100 E BASIC	Piece	1	8	8	3
APS 140 E PREMIUM	Piece	1	9	9	3
APS 140 E PREMIUM LIGHT	Piece	1	9	9	3
APS 140 E PREMIUM BASIC	Piece	1	9	9	3
APS 140 E PREMIUM INOX	Piece	1	9	9	3
APS 140 I PREMIUM	Piece	1	9	9	3
APS 190 E PREMIUM	Piece	1	9	9	3



2. MOUNTING

The APS zero point modules must be installed without air pressure at the lines.

2.1 MOUNTING APS 100 (drw. 3)

The locating for the APS module is done by pilot dia. $\varnothing 80^{H7}$ and will be fixed by 8 screws M5x25 UNI5931 12.9. The radial orientation is done by a pin $\varnothing 8 \times 20$ mm.

Pneumatic connections are size $\varnothing 4$ mm and the recommended fitting sizes will be G1/8" (not supplied with the APS module). Pneumatic connections are indicated at the below drw. 3:

- 1) Unclamp port
- 2) Turbo port
- 3) Air cleaning port

Proceed as follows:

Clean and oil accurately the pilot dia., the axial surfaces and the centering dia. at the APS module. Install the delivered O-rings at the corresponding dia. Put the APS module by hand into the pilot dia. and insert the 8 screws fixed by hand.

The screws must be tightened properly with a torque of 9.5 Nm. After tighten all screws close the screws holes by using the caps which are delivered together to protect them from dust and chips.

After the APS module is fixed at his location, the pneumatic connection could be done.

The maximum operating pressure will be 6 bars. The air must be filtered through a $20 \mu\text{m}$ filter and lubricated. We recommend the use of a self-locking unidirectional operating valve which will maintain the pressure even in case of a pressure loss at the pneumatic circuit.

2.2 MOUNTING APS 140 (drw. 4)

The locating for the APS module is done by pilot dia. $\varnothing 115^{H7}$ and will be fixed by 9 screws M6x35 UNI5931 12.9. The radial orientation is done by a pin $\varnothing 10 \times 20$ mm.

Pneumatic connections are size $\varnothing 4$ mm and the recommended fitting sizes will be G1/4" (not supplied with the APS module). Pneumatic connections are indicated at the below drw. 4:

- 1) Unclamp port
- 2) Turbo port
- 3) Air cleaning port

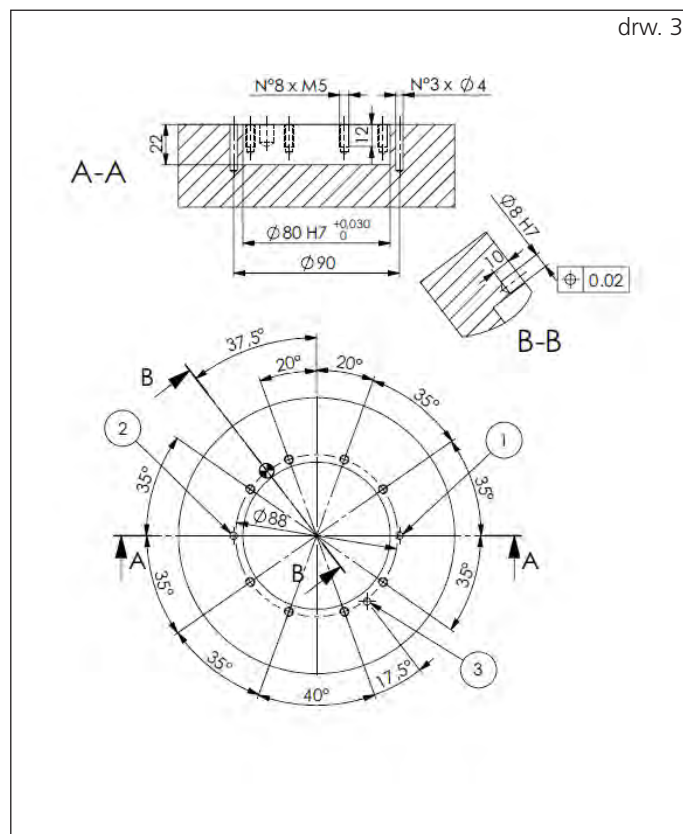
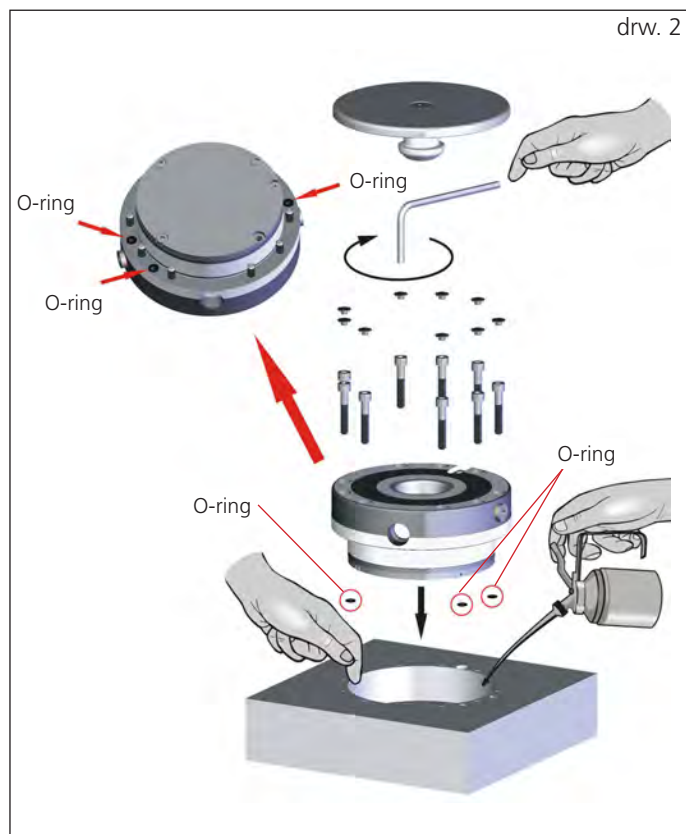
Proceed as follows:

Clean and oil accurately the pilot dia., the axial surfaces and the centering dia. at the APS module. Install the delivered O-rings at the corresponding dia. Put the APS module by hand into the pilot dia. and insert the 9 screws fixed by hand.

The screws must be tightened properly with a torque of 15 Nm. After tighten all screws close the screws holes by using the caps which are delivered together to protect them from dust and chips.

After the APS module is fixed at his location, the pneumatic connection could be done.

The maximum operating pressure will be 6 bars. The air must be filtered through a $20 \mu\text{m}$ filter and lubricated. We recommend the use of a self-locking unidirectional operating valve which will maintain the pressure even in case of a pressure loss at the pneumatic circuit.



2.3 MOUNTING APS 190 (drw. 5)

The locating for the APS module is done by pilot dia. $\varnothing 155H7$ and will be fixed by 9 screws M8x35 UNI5931 12.9. The radial orientation is done by a pin $\varnothing 10 \times 20$ mm.

Pneumatic connections are size $\varnothing 4$ mm and the recommended fitting sizes will be G3/8" (not supplied with the APS module).

Pneumatic connections are indicated at the below drw. 5:

- 1) Unclamp port
- 2) Turbo port
- 3) Air cleaning port

Proceed as follows:

Clean and oil accurately the pilot dia., the axial surfaces and the centering dia. at the APS module. Install the delivered O-rings at the corresponding dia. Put the APS module by hand into the pilot dia. and insert the 8 screws fixed by hand. Insert (if present) the pin for axial reference.

The screws must be tightened properly with a torque of 39 Nm. After tighten all screws close the screws holes by using the caps which are delivered together to protect them from dust and chips.

After the APS module is fixed at his location, the pneumatic connection could be done.

The maximum operating pressure will be 6 bars. The air must be filtered through a 20 μm filter and lubricated. We recommend the use of a self-locking unidirectional operating valve which will maintain the pressure even in case of a pressure loss at the pneumatic circuit.

3. CLAMPING PINS

The clamping and positioning of the fixture and/or workpiece will be carried out by clamping pins.

There are three types of pins available, according to their function.

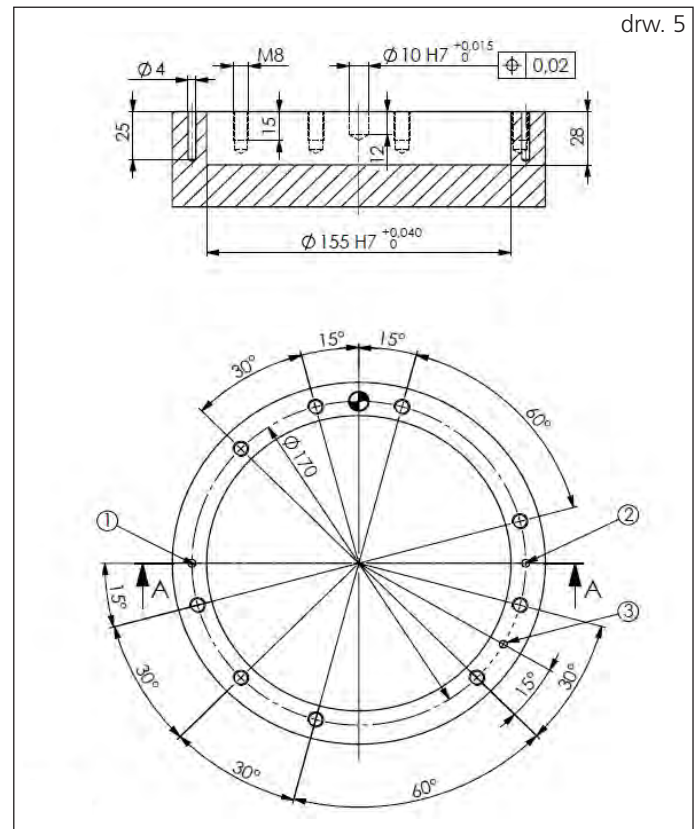
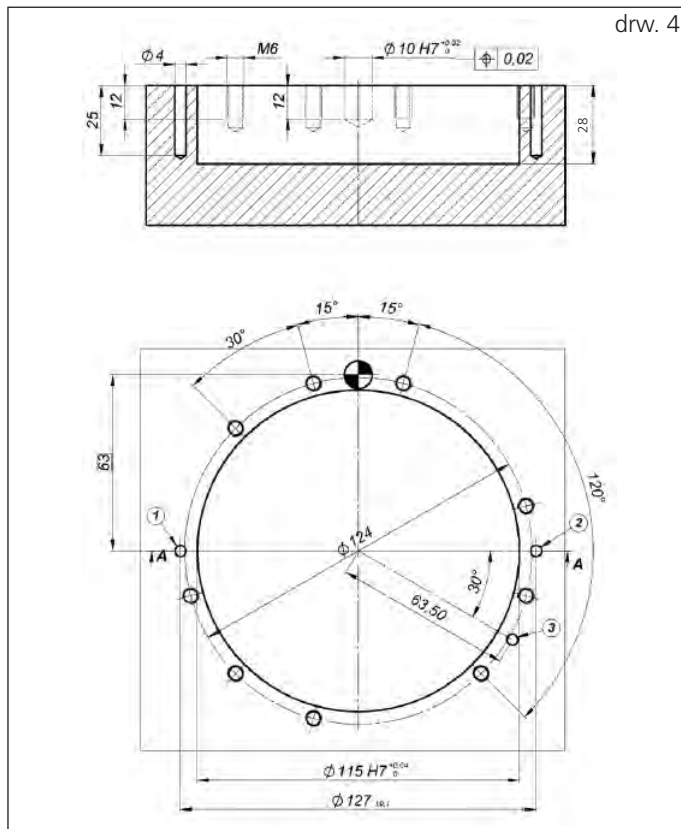
Pin type "A" centering pin, high precise centering and clamping

Pin type "B" sword pin, for reference and clamping

Pin type "C" clamping pin, only clamping function ± 0.05 mm

On page 18-20 you will see all necessary dimensions to get the right selection for the pins for the APS system.

For an easier assembly installation type 3 will be recommended.



5. INSTRUCTION AND EXAMPLES OF THE MOUNTING

By using of only one APS module you will need for positioning an additional kit composed by 1 dowel pin 1 and one key 2 incl. screws (see drw. 6).

5.1 Example of application on the plate (drw. 8)

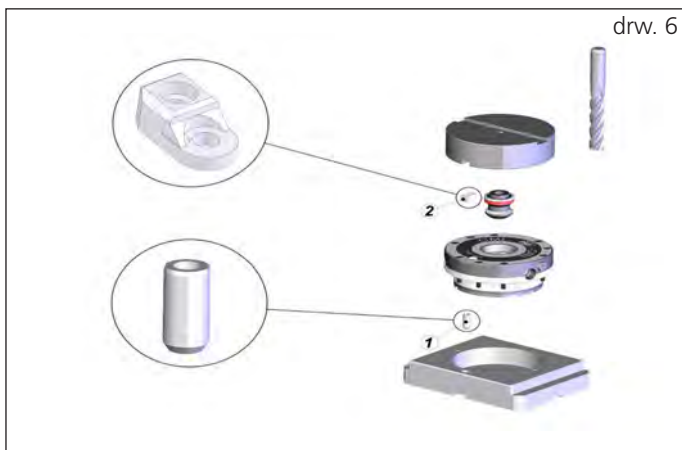
If the APS modules are not in use, the units could be protected by the following covers:

SMW-AUTOBLOK Type	APS 100	APS 140	APS 190
Cover	46162135	46162325	46162625

! Putting compressed air in the «A» port, the clamping jaws of the APS will open and the air cleaning of the stud hole in the unit will be on.

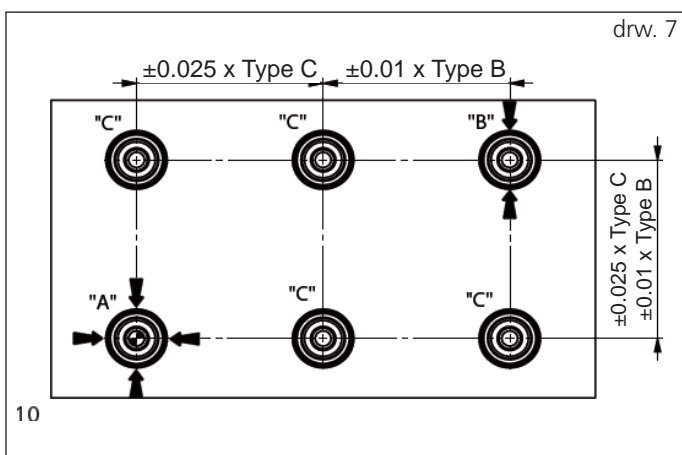
Putting compressed air in the «T» port, the additional clamping force due to the «TURBO function» will be applied.

ATTENTION!



At drw. 7 is indicated an example of pallet installation with 6 pins.

One type "A", one type "B" and 4 type "C" pins incl. the geometrical and dimensional tolerances.



On page 18-20 are all dimensional data's and tolerances for all pins like type "A", "B" and "C" are shown.

Tightening torque and holding force for screws tcei class 12.9					
Screw dimension	M6	M8	M10	M12	M16
Tightening torque [Nm]	15	30	60	110	260
Holding force [kN]	15	28	35	50	75

! **ATTENTION:** In case that the APS module is mounted on a horizontal axis or vertical inverted axis (pick-up), before unscrewing the pins from the plate or to operate the APS module, pay the maximum attention to avoid dropping the part or the pelletized unit!

! **ATTENTION:** Put the air protection (Pos. 1, drw. 8) on the air plug while machining.


6. MAINTENANCE

The APS modules are designed for very low maintenance needs. We suggest a visual check and checking the opening and closing action of the jaws (without the pins) once after every 100 cycles or once a week.

Please keep the clamping hole inside the APS module always free from chips, swarf and coolant.

The disassembling of the APS units from the machine must be done with the machine off and also the air feed off.

6.1 DISASSEMBLING

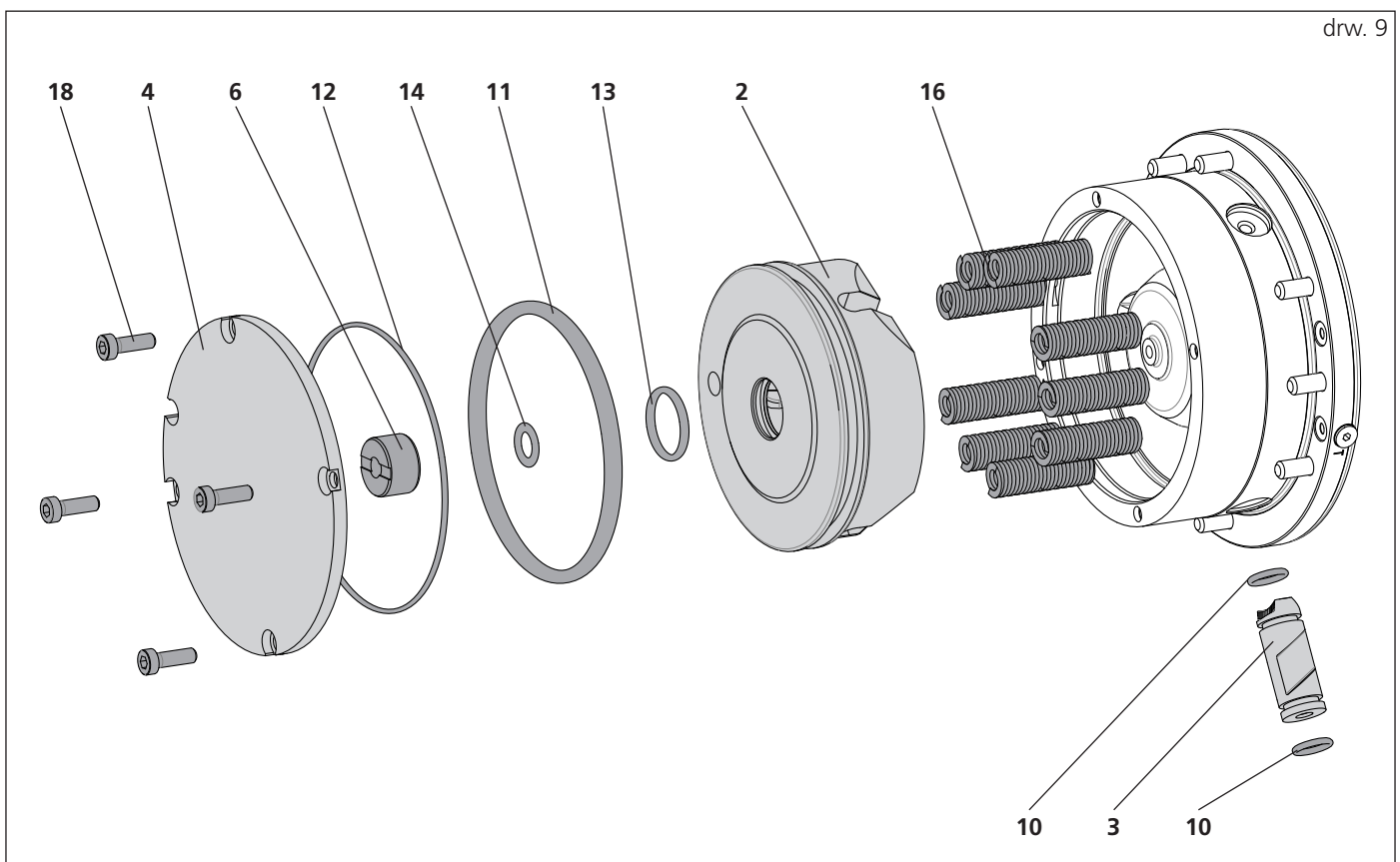
 **ATTENTION:**
Pay maximum attention during the disassembling of the APS module due to the presence of pre-loaded springs!

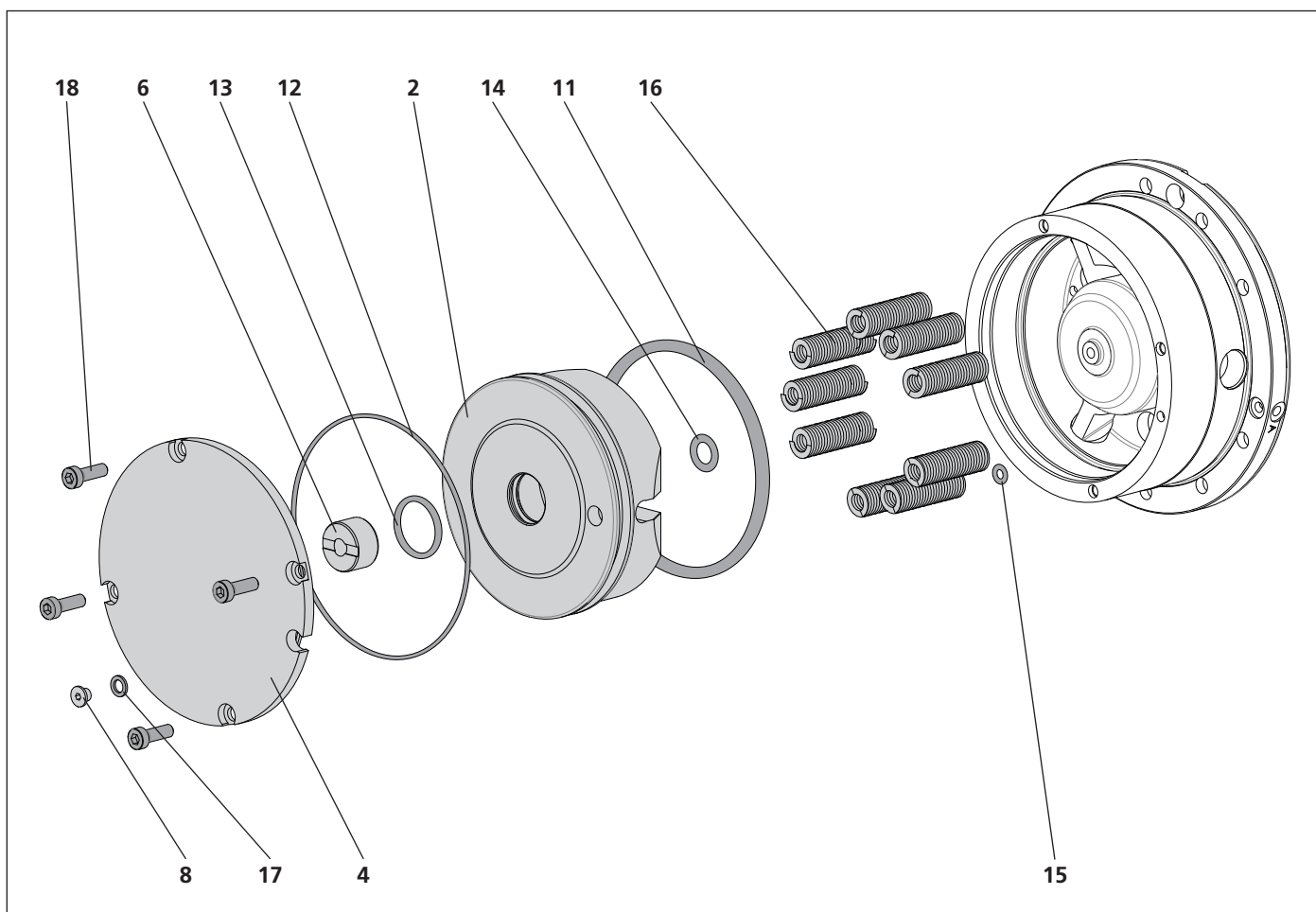
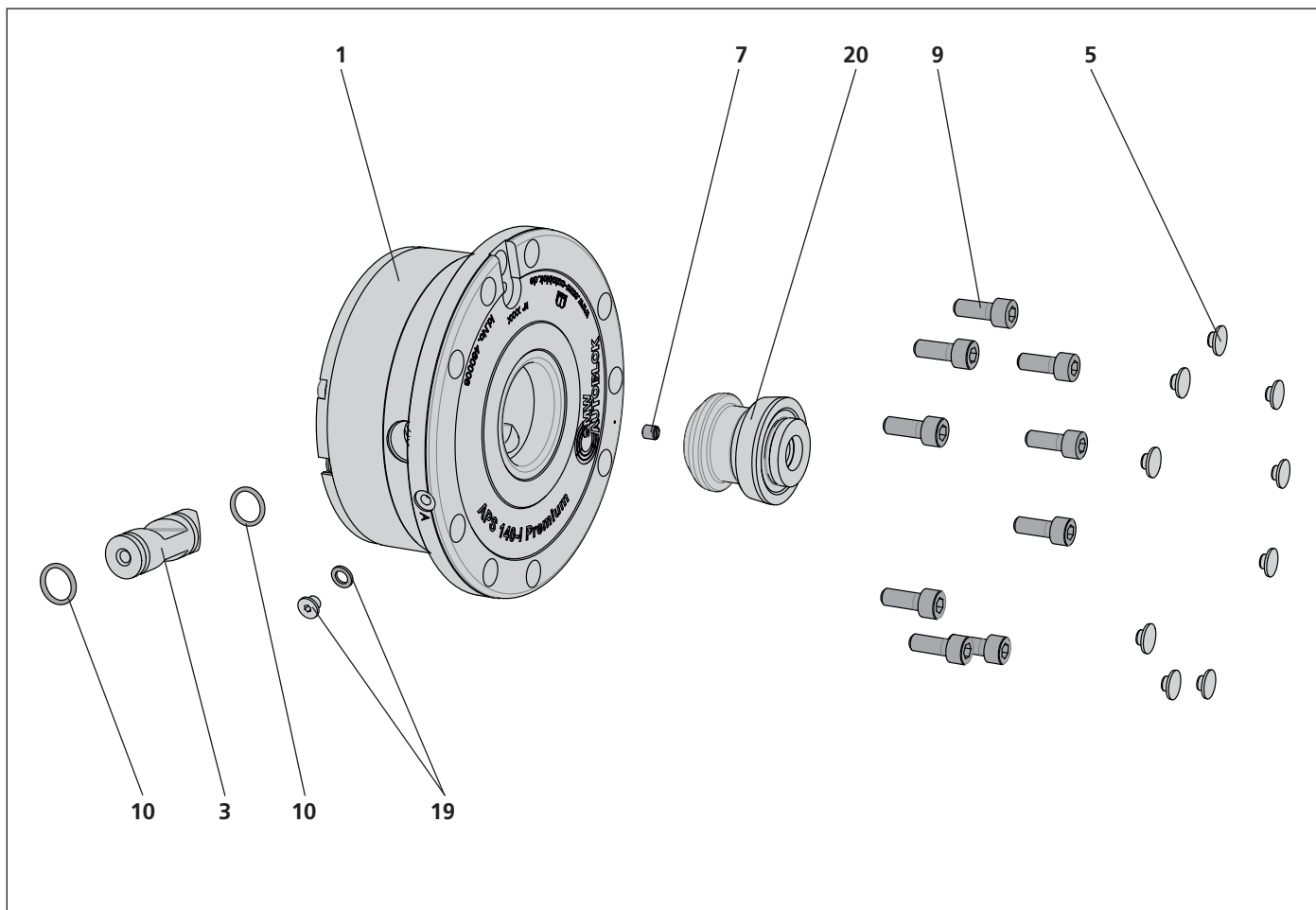
Unscrew carefully all screws holding the rear cover on the module body in order to relax the springs. The screws are longer to save this operation.

- a) Loosen the screw 18 from the rear cover 4 a little bit to relieving springs before removing the cover.
- b) Remove the cover and the seal 12.
- c) Remove the pin 6 and the seal 14.
- d) Remove the wedge 2 and the seals 11 and 13.
- e) Remove the springs 16.
- f) Extract from the side the driver pins 3 and remove the seals 10.

6.2 REASSEMBLY

For reassembling proceed in the reverse order like shown in 6.1.





Spare part list APS 100 / APS 190

Pos.	Description	Qty.	APS 100 E PREMIUM	APS 100 E BASIC	APS 190 E PREMIUM
1	Body	Piece	1	1	1
2	Wedge	Piece	1	1	1
3	Driver pin	Piece	2	2	3
4	Back cover for screw fastening	Piece	1	1	1
5	Plug	Piece	8	8	9
6	Pin	Piece	1	-	-
7	Grub screw	Piece	1	-	-
8	Plug	Piece	-	-	1
9	Screw UNI5931 12.9 unbrak	Piece	8	8	9
10	O-ring	Piece	4	4	6
11	O-ring	Piece	1	1	1
12	O-ring	Piece	1	1	1
13	O-ring	Piece	1	-	1
14	O-ring	Piece	1	-	1
15	O-ring	Piece	2	2	3
16	Spring	Piece	8	8	15
17	Washer unit	Piece	-	-	1
18	Screw UNI5931 10.9 unbrak	Piece	6	6	4
19	El plug + packing ISO228	Piece	2	2	2
20A	Clamping pin type „A“	Piece	1	1	1
20B	Clamping pin type „B“	Piece	1	1	-
20C	Clamping pin type „C“	Piece	1	1	-
20A	Clamping pin type „A“	Piece	1	1	-
20B	Clamping pin type „B“	Piece	1	1	-
20C	Clamping pin type „C“	Piece	1	1	-

Spare part list APS 140

Pos.	Description	Qty.	APS 140 E PREMIUM	APS 140 E PREMIUM INOX	APS 140 E PREMIUM LIGHT	APS 140 E BASIC	APS 140 I E PREMIUM
1	Body	Piece	1	1	1	1	1
2	Wedge	Piece	1	1	1	1	1
3	Driver pin	Piece	3	3	3	2	3
4	Back cover for screw fastening	Piece	1	1	1	1	1
5	Plug	Piece	9	9	9	9	9
6	Pin	Piece	1	1	1	-	1
7	Grub screw	Piece	1	1	1	-	1
8	Plug	Piece	1	1	1	1	1
9	Screw UNI5931 12.9 unbrak	Piece	9	9	9	9	9
10	O-ring	Piece	6	6	6	4	6
11	O-ring	Piece	1	1	1	1	1
12	O-ring	Piece	1	1	1	1	1
13	O-ring	Piece	1	1	1	-	1
14	O-ring	Piece	1	1	1	-	1
15	O-ring	Piece	3	3	3	2	3
16	Spring	Piece	6 + 3	6 + 3	6 + 3	8	6 + 3
17	Washer unit	Piece	1	1	1	1	1
18	Screw UNI5931 10.9 unbrak	Piece	4	4	4	4	4
19	El plug + packing ISO228	Piece	2	2	2	2	2
20A	Clamping pin type „A“	Piece	1	1	1	1	1
20B	Clamping pin type „B“	Piece	1	1	1	1	1
20C	Clamping pin type „C“	Piece	1	1	1	1	1
20A	Clamping pin type „A“	Piece	1	1	1	1	1
20B	Clamping pin type „B“	Piece	1	1	1	1	1
20C	Clamping pin type „C“	Piece	1	1	1	1	1

Problem	Caused by / Action	
The pull-stud remains locked or clamped in its seat	A	Check that the operating air-line pressure (opening port «A») is higher than 5 bar
	B	Check the presence of oil in the lubrication and filter unit and, if insufficient, add the correct oil in the tank
	C	Check that the "TURBO" function (port «T») is not under pressure
	D	Check that all the tubes, channels and/or hoses bringing air to the opening port «A» are not clogged, interrupted and that their internal diameters are at least of the prescript diameter
The pull-stud is not clamped by the locking pins	A	Check that the pull-stud hole is clean from chips and swarf
	B	Check that the opening port «A» is not under pressure
The pneumatic part presence (PEL) does not flag the presence of the plate/part on the APS positioner	A	Check that there is no chip or swarf between the APS positioner and the plate/part
	B	Check the pressure in the PEL circuit
	C	Check the setting of the air-flux sensor
The pneumatic part presence (PEL) flags the presence of the plate/part even if there is no plate/part	A	Check that the PEL hole on the face of the body of the APS positioner is not clogged by swarf or chips
	B	Check the setting of the air-flux sensor
Component is broken, e.g. through overloading	A	Replace module or send it to SMW-AUTOBLOK for repair.

12 months warranty

Product: Automatic Positioning System APS

SMW-AUTOBLOK provides a warranty on the purchased product for 12 months from the date of purchase as stipulated in our General Terms of Sale in the following cases:

- The defect was not known to the customer at the time of purchase.
- The defect is not due to wear as a result of use.
- The customer has not been negligent by improperly operating or incorrectly maintaining of our product. Refer to the enclosed instruction manual for operation and maintenance information.
- It is not a wear part such as seals, rollers or valves.
- Especially work piece touching parts such as jaws, locators, inserts, rollers and face drivers are excluded from warranty.
- Only original SMW-Autoblok parts have been used such as spare parts, seals, rollers, valves, jaws, locators, inserts and face drivers.
- There is evidence that the maintenance intervals in the operating instructions have been followed. The customer must provide maintenance documentation for this purpose. The maintenance performed must be documented in the maintenance section of the operating instructions and signed by a properly authorized person.

Please note that, if the above requirements are not met, the warranty is only invalid if the defect already existed at the time of transfer of risk, which is usually upon delivery of the product, unless the customer was aware of the defect at the time of transfer of risk.

24-months warranty -optional-

Product: Automatic Positioning System APS

Against additional fee, SMW-AUTOBLOK offers a warranty on the purchased product for 24 months from date of purchase as a modification to the 12-month limitation period stipulated in our General Terms of Sale if the following conditions are met:

- An extension of the warranty from 12 to 24 months has been agreed upon in writing with SMW-AUTOBLOK.
- There is no defect due to wear as a result of use.
- The defect was not known to the customer at the time of purchase.
- The customer has not been negligent by improperly operating or incorrectly maintaining of our product. Refer to the enclosed instruction manual for operation and maintenance information.
- It is not a wear part such as seals, rollers or valves.
- Especially work piece touching parts such as jaws, locators, inserts, rollers and face drivers are excluded from warranty.
- Only original SMW-Autoblok parts have been used such as spare parts, seals, rollers, valves, jaws, locators, inserts and face drivers.
- There is evidence that the maintenance intervals in the operating instructions have been followed. The customer must provide maintenance documentation for this purpose. The maintenance performed must be documented in the maintenance section of the operating instructions and signed by a properly authorized person.
- Paid inspection by or at SMW-AUTOBLOK is mandatory.
Minimum interval with maintenance documentation by SMW-AUTOBLOK.

Single shift operation	once in 24 months
2- and 3-shift operation	once in 12 months

The customer is responsible for having inspections performed on time.


- The delivery location and machine location are within Germany.


Product: _____


Serialno.: _____




Regular and documented maintenance conserves the value of your work holding, and ensures warranty!

Maintained according to instruction manual	YES <input type="checkbox"/>	
Operating hours		
Name		
Date		
Signature		
Remarks		


Maintained according to instruction manual	YES <input type="checkbox"/>	
Operating hours		
Name		
Date		
Signature		
Remarks		


Maintained according to instruction manual	YES <input type="checkbox"/>	
Operating hours		
Name		
Date		
Signature		
Remarks		


Maintained according to instruction manual	YES <input type="checkbox"/>	
Operating hours		
Name		
Date		
Signature		
Remarks		


Product: _____


Serialno.: _____

 Regular and documented maintenance conserves the value of your work holding, and ensures warranty!

Maintained according to instruction manual	YES <input type="checkbox"/>	
Operating hours		
Name		
Date		
Signature		
Remarks		

Maintained according to instruction manual	YES <input type="checkbox"/>	
Operating hours		
Name		
Date		
Signature		
Remarks		

Maintained according to instruction manual	YES <input type="checkbox"/>	
Operating hours		
Name		
Date		
Signature		
Remarks		


Maintained according to instruction manual	YES <input type="checkbox"/>	
Operating hours		
Name		
Date		
Signature		
Remarks		


Product: _____


Serialno.: _____




Regular and documented maintenance conserves the value of your work holding, and ensures warranty!

Maintained according to instruction manual	YES <input type="checkbox"/>	
Operating hours		
Name		
Date		
Signature		
Remarks		


Maintained according to instruction manual	YES <input type="checkbox"/>	
Operating hours		
Name		
Date		
Signature		
Remarks		


Maintained according to instruction manual	YES <input type="checkbox"/>	
Operating hours		
Name		
Date		
Signature		
Remarks		


Maintained according to instruction manual	YES <input type="checkbox"/>	
Operating hours		
Name		
Date		
Signature		
Remarks		


Product: _____


Serialno.: _____

 Regular and documented maintenance conserves the value of your work holding, and ensures warranty!

Maintained according to instruction manual	YES <input type="checkbox"/>	
Operating hours		
Name		
Date		
Signature		
Remarks		

Maintained according to instruction manual	YES <input type="checkbox"/>	
Operating hours		
Name		
Date		
Signature		
Remarks		

Maintained according to instruction manual	YES <input type="checkbox"/>	
Operating hours		
Name		
Date		
Signature		
Remarks		

Maintained according to instruction manual	YES <input type="checkbox"/>	
Operating hours		
Name		
Date		
Signature		
Remarks		

Empfangsbestätigung für die Betriebsanleitung Confirmation of receipt of the instruction manual



Hiermit bestätigt die vom Betreiber/ Anwender beauftragte Person

This certifies the operator assigned by the operating company

Herr / Frau

Mr. / Mrs.

den Erhalt der Betriebsanleitung sowie deren Inhalte, insbesondere das Kapitel Sicherheit gelesen und verstanden zu haben.

hereby confirms to have received the instruction manual and to have read and understood the content, especially the chapters concerning safety.

Bediener

Datum

Operator

Date

Betreiber / Sachbeauftragter

Datum

Operating Company /
Authorised person

Date

Id.Nr. / Id. No.

:

Artikelbez. / Item

:

Gewicht / Weight

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