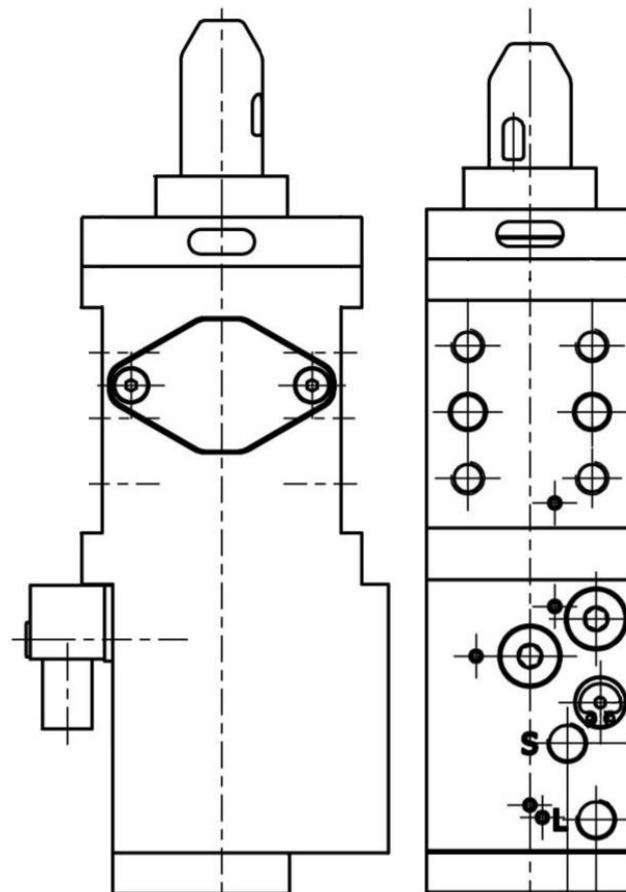


Installation and operating instructions

Retractable Locating and Expanding Pin SDZ 40 F



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1 General description

This chapter contains notes on this Installation and operating instructions, along with general safety instructions for handling the Retractable Locating and Expanding Pin SDZ 40 F.

In the following sections, the partially completed machine Retractable Locating and Expanding Pin SDZ 40 F is also referred to as the Machine.

1.1 Information about Installation and operating instructions

This Installation and operating instructions is an key component of the user documentation for the Machine. Follow all instructions, data, and requirements in the Installation and operating instructions. The Installation and operating instructions will help you to operate the Machine safely, and with a high availability.

We reserve the right to make technical changes designed to improve the Machine described in the Installation and operating instructions.

1.2 Layout of the Installation and operating instructions

Safety-relevant instructions are identified by the appropriate symbols.

Listings

Listings of features in any order or an order that need not be strictly maintained are marked with a bullet.

Example:

- Property A
- Property B
 - ▣ Sub-property of property B

Order

Steps that must be performed in the specified order are enumerated and the results of the steps are shown in *italics*.

Example:

1. Step 1 to be performed
Result of step 1
2. Step 2 to be performed
 - 2.1 Sub-step of step 2 to be performed

1.3 Use of the Installation and operating instructions

This Installation and operating instructions helps you to familiarise yourself with the Machine and use it as intended.

The Installation and operating instructions must be supplemented due to existing national directives concerning accident prevention and environmental protection.

Ensure that the Installation and operating instructions is always available at the operation site of the Machine and is in a legible condition.

The Installation and operating instructions must be read and applied by all persons commissioned to work with/on the Machine, e.g.: operating including setting-up, fault repair, care, disposal of operational and auxiliary materials, repairs (maintenance, servicing) and / or transportation.

In addition to the Installation and operating instructions and the binding regulations for accident prevention applicable in the country and site of implementation, the approved industry-specific rules for safety and professional work must be complied with.

1.4 Obligations of the Operator

The operator is obliged to only allow persons to work on the Machine , who

- are familiar with the basic requirements concerning work safety and accident prevention, and are trained in the operation of the Machine .
- have read and understood the safety instructions and warning instructions in this Installation and operating instructions and have confirmed this with their signature.
- have been trained or instructed and whose responsibilities for operation, setting up, maintenance and repairs have been clearly defined.
- are regularly instructed in complications, hazards, and other particular rules of conduct.

The operator is obliged to:

- observe and instruct staff on the legal and other obligatory regulations on accident prevention, environmental protection and handling of dangerous goods in addition to the Installation and operating instructions .
- provide protective equipment.
- establish the responsibility of the Machine operator, to allow the Machine operator to reject unsafe third party instructions.
- check safety-aware work of staff at regular intervals.
- follow legal requirements and rules at the site of the Machine.

1.5 Training instructions

Only deploy trained or instructed staff. Clearly define staff responsibilities for operation, setting-up, maintenance and repairs.

While working on or with the machine, staff who have not yet completed training, or staff working on the machine in the course of an apprenticeship, must be accompanied and supervised by an experienced member of staff who is familiar with the Machine at all times.

1.6 Requirements for staff

Before commencing work, all persons tasked with working on the Machine must:

- follow the basic instructions concerning work safety and accident prevention.
- read the safety and warning instructions in this Installation and operating instructions and confirm that they have understood them with their signature.
- use personal/ workplace-related protective clothing and auxiliary materials that serve work safety or while working, provided that this is necessary for safety related reasons.
- comply with specifications of competence.


For example, work on the electrical or pneumatic device of the Machine can only be performed by a qualified electrician, or by staff who have received appropriate training, monitored by a qualified electrician as per the current technical rules.

Unauthorised persons are not permitted access.

1.7 Dangers when operating the Machine

The Machine has been constructed according to the state of the art and in line with recognised safety regulations. In spite of this, hazards to life and limb of the users or to third parties, or impairments to the Machine and other capital assets can arise from its use.

Only use the Machine when in a safe and perfect state and for the intended use.

	WARNING
	<p>Observe safety instructions!</p> <ul style="list-style-type: none"> ▪ Only operate the Machine if the protective devices and safety devices are integrated into the complete system, for example, separating protective devices or emergency stop systems required for operating the Machine are in place and functional. ▪ Immediately eliminate any faults that could impair safety. ▪ Observe the residual risks and dangers in Chapter 2 "Safety instructions".

1.8 Intended use

The Machine is designed exclusively for holding a component on the retractable/extensible centring mandrel and clamping the component with the retractable/extensible clamping jaws.

The Machine must be operated exclusively within the performance limits stated in Chapter 3 "Technical data".

Any other use, or any use beyond this scope shall be regarded as misuse and is unintended; TÜNKERS Maschinenbau GmbH company shall not be liable for any damage resulting from unintended use.

The partially completed Machine must not be operated until it has been installed in a Machine that complies with the provisions of the pertinent Machinery Directive.

The incomplete Machine must be incorporated into a complete machine. The manufacturer/operating company of the complete machine must ensure that the partially completed Machine is integrated into the emergency stop circuits of the complete machine and into the control system, and must create the appropriate operating modes.

Access to the partially completed Machine must be secured by the manufacturer/operating company of the complete machine and regulated by the operating company, e.g. protective perimeter with interlocked safety doors.

Operating functions must be designed to reflect the operating mode, e.g., they must be disabled when a safety door is open and the safety zone can be entered.

Mechanical hazards resulting from the integration of the incomplete Machine into the overall machine must be assessed and, if necessary, safeguarded by the manufacturer/operator of the complete machine (e.g., by means of isolating safety devices, local connection of the operator via enabling switches, etc.).

The manufacturer/operator of the complete machine in which the partially completed Machine is installed is responsible for ensuring that it can absorb all static/dynamic forces of the complete machine.

Intended use also includes:

- observing all information and directives in the operating instructions and all applicable documents.
- observing the mandatory service and maintenance intervals, or the service and maintenance intervals specified in the instruction manual and applicable documentation.

1.9 Reasonably foreseeable misuse

The following, in particular, are considered as reasonably foreseeable misuse:

- Use of components that do not comply with the product specification.
- Use of the Machine for other purposes.
- Operating the Machine with bridged safety devices.
- Operating the Machine with incomplete protection.
- Acknowledging safety devices while a person is in the protected area.
- Operating, maintaining and repairing the Machine by non-authorised and non-instructed persons.
- Operating the Machine in an area with a risk of explosion.

1.10 Warranty claims and liability





Our "General Terms of Sale and Delivery" always apply. These are available to the operator of the Machine on the conclusion of the contract at the latest.

Warranty and liability claims in the case of personal injury and material damage are excluded if they are due to one or more of the following causes:


- Unintended use
- Incorrect assembly, commissioning, operating, and maintenance.
- Operating the Machine with defective safety equipment, or without appropriate safety equipment or with non-functional safety protective devices.
- Failure to follow the instructions for transportation, storage, assembly, commissioning, operation, maintenance and setting-up in the Installation and operating instructions,
- Unauthorised physical/structural changes.
- Inadequate monitoring of Machine components that are subject to wear and tear..
- Improper repair works.
- Disasters caused by foreign objects or an Act of God.
- Vandalism.





2 Safety instructions

2.1 Safety symbols in this Installation and operating instructions


	DANGER "DANGER" identifies an immediate threat of danger which can lead to severe injury or death.
	WARNING "WARNING" identifies a potentially dangerous situation which can lead to severe injury or death.
	CAUTION "CAUTION" identifies a potentially dangerous situation which could lead to minor injury.
	NOTE "NOTE" identifies a potentially dangerous situation that can lead to material and environmental damage. This signal word is also used for application instructions and other useful information.


2.2 General safety instructions


	WARNING Risk to persons and the Machine! <ul style="list-style-type: none"> ▪ Maintain all safety and hazard instructions at and on the Machine in a complete and legible condition! ▪ Avoid any unsafe methods of working. ▪ Keep the Installation and operating instructions available at the machine site at all times. ▪ Stop the Machine immediately and report the fault to the responsible department/person when safety-relevant modifications are made to the machine line or the operating behaviour of the Machine changes. ▪ Follow the applicable regulations for occupational safety and health protection (DGUV (German Statutory Accident Insurance) regulations). ▪ Do not arbitrarily modify the Machine.
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   	<table><tr><th>CAUTION</th></tr><tr><td>Risk of injury!<ul style="list-style-type: none">▪ Use personal protective clothing, safety shoes, ear protection and safety gloves.▪ Use prescribed safety gear!</td></tr></table>	CAUTION	Risk of injury! <ul style="list-style-type: none">▪ Use personal protective clothing, safety shoes, ear protection and safety gloves.▪ Use prescribed safety gear!
CAUTION			
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2.3 Safety instructions for operation

	<table><tr><th>WARNING</th></tr><tr><td><p>Risk of injury due to clamping movement!</p><p>Danger of crushing in case of reaching in between the component and extended clamping jaws when clamping the component.</p><ul style="list-style-type: none">▪ Do not reach in between the component and the extended clamping jaws.▪ Before actuating or initiating individual movements, make sure that no one will be endangered by these actions.</td></tr></table>	WARNING	<p>Risk of injury due to clamping movement!</p> <p>Danger of crushing in case of reaching in between the component and extended clamping jaws when clamping the component.</p> <ul style="list-style-type: none">▪ Do not reach in between the component and the extended clamping jaws.▪ Before actuating or initiating individual movements, make sure that no one will be endangered by these actions.
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	<table><tr><th>WARNING</th></tr><tr><td><p>Improper use of the Machine!</p><ul style="list-style-type: none">▪ Use the Machine in line with its intended purpose.▪ Use the Machine in a technically perfect, operationally ready and functionally reliable state.▪ Have any damage to the Machine professionally repaired, before putting the Machine into operation.▪ Check the Machine for damage before starting work.</td></tr></table>	WARNING	<p>Improper use of the Machine!</p> <ul style="list-style-type: none">▪ Use the Machine in line with its intended purpose.▪ Use the Machine in a technically perfect, operationally ready and functionally reliable state.▪ Have any damage to the Machine professionally repaired, before putting the Machine into operation.▪ Check the Machine for damage before starting work.
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	WARNING
	<p>Improper use of the Machine!</p> <ul style="list-style-type: none"> ▪ Only qualified and authorised staff are permitted to operate the Machine. ▪ Familiarise yourself with the Machine. ▪ Clearly establish responsibilities and work areas. ▪ Be aware of all potential dangers on the Machine.




	CAUTION
	<p>Danger of injury in the event of damage to the pneumatic system!</p> <p>Media under high pressure unexpectedly develop high forces and can cause injuries.</p> <ul style="list-style-type: none"> ▪ In case of damage to the pneumatic equipment, switch off the Machine and immediately inform the appropriate department/person. ▪ Immediately repair any damage. ▪ All work on pneumatic equipment can only be carried out by authorised and skilled professionals.

2.4 Safety instructions for setup, maintenance, servicing, repair and troubleshooting

	WARNING
	<p>Danger to persons and the Machine!</p> <ul style="list-style-type: none"> ▪ Only authorised specialists may set up and maintain the Machine and remedy malfunctions. ▪ Familiarise yourself with individual maintenance and repair instructions before carrying out work. ▪ Cordon off the area for set-up work, servicing, maintenance and fault repair with a large parameter, as required.

	WARNING
	<p>Risk of accidents!</p> <ul style="list-style-type: none"> ▪ Cordon off the maintenance and repair area with a large safety perimeter as required. ▪ Make sure that there is no one in the danger area before switching on the Machine . ▪ Be careful and observant in the entire working area of the Machine and the complete system.

	WARNING
	<p>Danger due to unexpected restart!</p> <ul style="list-style-type: none"> ▪ Deenergise and depressurise the Machine during adjustment, maintenance and repair works and lock to prevent an unexpected restart. ▪ Post a warning sign on the control unit, stating that the Machine must not be operated.

	CAUTION
	<p>Danger due to improper work on the Machine!</p> <ul style="list-style-type: none"> ▪ The specified adjustment, maintenance and servicing work at the required intervals is carried out by qualified personnel. ▪ Clean loosened connections and screw connections. ▪ Tighten screw connections to the corresponding tightening torque. ▪ Regularly check all screw connections. ▪ Follow the maintenance schedules provided by third-party manufacturers.
	NOTE
	<p>Material damage due to improper cleaning!</p> <p>The wrong cleaning agents and methods can lead to serious material damage on the machine.</p> <ul style="list-style-type: none"> ▪ Follow the manufacturer's specifications on system components and cleaning agents.
	NOTE
	<p>Pollution!</p> <ul style="list-style-type: none"> ▪ Dispose of replaced parts, operating fluids and auxiliary materials in a safe and environmentally friendly manner.

3 Technical data

3.1 Complete Machine

Pneumatic equipment	
Designation	Retractable Locating and Expanding Pin SDZ 40 F
Year of construction:	2018
Emission sound pressure level (L_{pAd}):	< 70 dB(A)
Weight:	2 kg
Dimensions (L x W x H):	approx. 88mm x 50mm x 213mm
Stroke:	10 mm
Tensile force:	1000 N
Pressing force:	850 N
Clamping range:	0 - 6 mm
Tolerance pin bore:	± 0.02 mm
Tolerance threaded hole:	± 0.1 mm

3.2 Pneumatic equipment

Pneumatic equipment	
Pneumatic pressure:	6 bar
External connection:	Dry, oil-free and cleaned

3.3 Electrical equipment

Electrical equipment	
Operating voltage sensors:	01.10.1930 V DC

4 Setup and function

4.1 Overview Retractable Locating and Expanding Pin SDZ 40 F

The Machine is used to pick up and centre a component on the centring mandrel and to clamp the component with the clamping jaws.

When the centring mandrel (a) extends, the clamping jaws (b) retract. The operator places the component to be clamped on the support (c) via the centring mandrel. When the centring mandrel (a) is retracted, the clamping jaws (b) extend and clamp the component against the support.

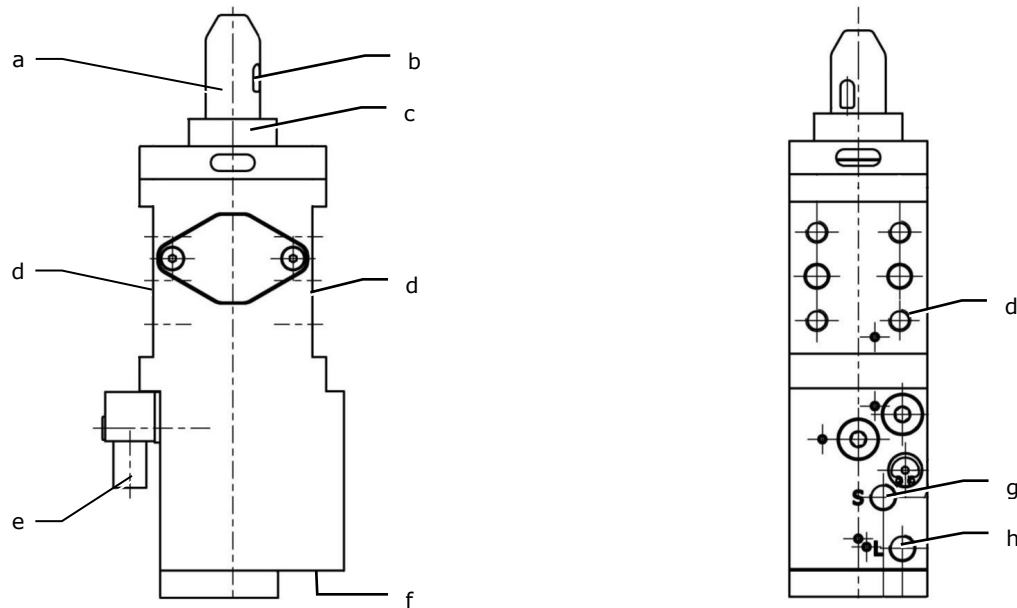



Fig. 4.1-1: Overview Retractable Locating and Expanding Pin SDZ 40 F

Pos.	Designation	Description
a	Centring mandrel	Extends/retracts. Centres the bore of the component.
b	Clamping jaws	Retract/extend. Clamp the component.
c	Support	Receives the component.
d	Threaded holes	Fasten the pin drawing cylinder.
e	Sensor set	Monitors the position of the centring mandrel and the clamping jaws.
f	Release	Deblocks via a pushbutton, which depressurises the system.
g	"Clamp" connection	Pneumatic connection: Retracts centring pin and extends clamping jaws.
h	"Release" connection	Pneumatic connection: Extends the centring pin and retracts the clamping jaws.

5 Transport, Assembly and Commissioning

	WARNING
	<p>Danger to persons and the Machine!</p> <ul style="list-style-type: none"> Only qualified personnel should be tasked with assembly and commissioning. Keep unauthorised persons away from the work. Use personal protection equipment. The operator must always have a line of sight to the danger area. During assembly, conversion, maintenance and adjustment work, disconnect the energy supplies and make sure there is no residual energy in the system.

5.1 Assembly

Requirement:

- The system on which the Machine is to be mounted must be deenergised and depressurised.
- Machine is ready for assembly.
- Bolting material is available.

Work steps:

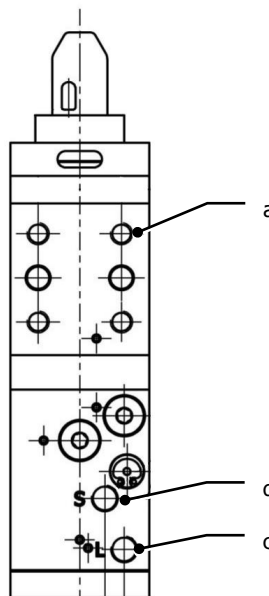



Fig. 5-1: Assembling the Machine

	NOTE
	<p>Material damage due to incorrect screw lengths! Screws that are too long prevent correct fastening.</p>

- Mount the Machine with four socket head bolts M8 x 1.25 to the holes (b) of the front or rear shoulder surface.
- Connect the compressed air supply between the pneumatic control and the connections (d, c).
- Connect the sensor set to the controller.

The use of external throttle valves is recommended for fine adjustment of the clamping action speed.

The Machine is ready for use.

5.2 Initial Start-up

Employees of the TÜNKERS Maschinenbau GmbH, the system manufacturer, or the operating company establish the connection according to the circuit diagram/pneumatic diagram and the setup during initial start-up.

6 Operation

The Machine must only be used according to its intended use (see chapter 1.8 "Intended use"). Specific requirements and safety instructions apply for the different operating modes of the Machine.


The Machine is run in the following operating modes:

- Automatic mode
- Manual mode (set-up mode)

The operator/manufacturer of the complete system is responsible for executing the operating modes.


The work involved with the operation, tooling, maintenance, and fault repair can be assigned to these operating modes.

6.1 Safety instructions

	WARNING
	Observe safety instructions! <ul style="list-style-type: none"> ▪ Observe the safety instructions in Chapter 2 "Safety instructions" and in particular Chapter 2.2 "General safety instructions".

6.2 Operating the Retractable Locating and Expanding Pin SDZ 40 F.

The Machine doesn't have any controls. The Machine is operated via the control of the complete system, in which the Machine is used.

	NOTE
	For information on operation, observe the operating manual of the complete system.

6.3 Basic checks before and during operation

Familiarise yourself with your work environment before starting work. Externally check (visually) the Machine for visible defects at least once per shift. Before starting work, the service and maintenance intervals must be followed in line with the maintenance schedule.

Before switching on the Machine and during operation, monitor the Machine area for anomalies at all times. The following features may indicate irregularities the Machine are switched on:


- increased noise, noise irregularly occurring/unusual noises.
- unusual smell
- leaks in the pneumatic system.
- reduced performance during operations
- incorrectly positioned

Shut down the Machine immediately upon the first signs of any of the above issues. Inform maintenance staff immediately for an accurate assessment of the technical status.

Maintenance staff must then decide if operation can continue without limiting the functionality of the Machine. If a failure is expected due to damage, perform repairs immediately.

7 Maintenance


7.1 Safety instructions

	DANGER
	<p>Follow the safety instructions!</p> <ul style="list-style-type: none"> Follow the safety instructions in chapter 2 "Safety instructions" and in particular chapter 2.2 "General safety instructions".


7.2 Maintenance and repair work


The Machine is designed for a low-maintenance operation. The care, maintenance and repair work described in this chapter are required to maintain a problem-free implementation of the Machine as intended. Regular care and maintenance extend the service life and increase the usability.

Only use materials, consumables and auxiliary substances that have been recommended by the manufacturer. Recommended lubricants are specified when required. Never mix lubricants.

	NOTE
	<p>Carry out special maintenance work in accordance with the maintenance plans of the third party manufacturers!</p> <p>Perform all maintenance work listed below at the appropriate intervals.</p>

7.3 Maintenance schedule

	NOTE
	<p>The Retractable Locating and Expanding Pin SDZ 40 F is equipped with low-maintenance bearings and guides. Due to the closed design of the Retractable Locating and Expanding Pin SDZ 40 F, special maintenance is not required.</p>

	NOTE
	<p>Possible damage due to improper cleaning!</p> <p>Cleaning with steam jet cleaner or dry ice will damage the Retractable Locating and Expanding Pin SDZ 40 F.</p>

8 Troubleshooting

8.1 Safety instructions

	DANGER
	Observe safety instructions! <ul style="list-style-type: none"> Observe the safety instructions in Chapter 2 "Safety instructions" and in particular Chapter 2.2 "General safety instructions".

Machine does not clamp/release

Possible cause	Repair measures
Errors/damages in the air supply	Check the air supply.
Falls below the minimum oil pressure	Check the operating pressure.
Clamping segments worn	Replace the clamping segments as part of a complete overhaul.
Clamping segments are difficult to move	Blow out clamping segments with compressed air, if necessary grease with Molykote BR2 Plus.
Spreading and centring mandrel worn or deformed	Replace spreading and centring mandrel.

Sensor set does not detect positions

Possible cause	Repair measures
Proximity switch does not switch	Proximity switch is incorrectly positioned Adjust the position
	Cabling, connections are defective or loose.
	Proximity switch is defective. Replace proximity switch
Proximity switch at bottom not switching	Set proximity switch to sheet thickness to be clamped.
Clamping jaws extending too slowly	Spreading and centring mandrel worn.
Clamping jaws extending too slowly	Set the speed via external compressed air throttles.
Spreading and centring mandrel worn.	Replace spreading and centring mandrel.

9 Appendix

9.1 Declaration of installation

Declaration of incorporation

In line with the Machinery Directive 2006/42/EC, Appendix II A

The manufacturer	TÜNKERS Maschinenbau GmbH Am Rosenkothen 4-12 D-40880 Ratingen, Germany +49 (0) 2102/4517-0
of the partially completed machine hereby declares:	
General designation	Retractable Locating and Expanding Pin SDZ 40 F
Function	Clamping, holding, locking and releasing of fixtures/components, e.g. on turntables.
Type designation	Retractable Locating and Expanding Pin SDZ 40 F
Serial number	-
Product name	Retractable Locating and Expanding Pin SDZ 40 F
Year of construction	2018

the following basic health and safety requirements in line with appendix I of the machine directive have been applied and adhered to:

Annex I, Article 1.1.2, 1.1.3, 1.1.5, 1.3.1, 1.3.2, 1.3.3, 1.3.4, 1.5.4, 1.5.8, 1.6.1, 1.6.3, 1.7.1, 1.7.3 und 1.7.4

The partially completed machine also complies with all provisions of the EMC Directive 2014/30/EU.

Specific technical documentation was created in line with Annex VII Part B.

All relevant information about the partially completed machine will be provided on reasoned request by the appropriate national authority.

Commissioning is prohibited until it has been established that - where applicable - the machine into which the partially completed machine above is to be installed complies with the provisions of the Machinery Directive 2006/42/EC.

Authorised representative for composing the technical documentation:

TÜNKERS Maschinenbau GmbH, Am Rosenkothen 4-12, D-40880 Ratingen, Germany, Tel.: +49 (0) 2102/4517-0

Ratingen

Place/date:

Olaf Tünkens
Managing Director