

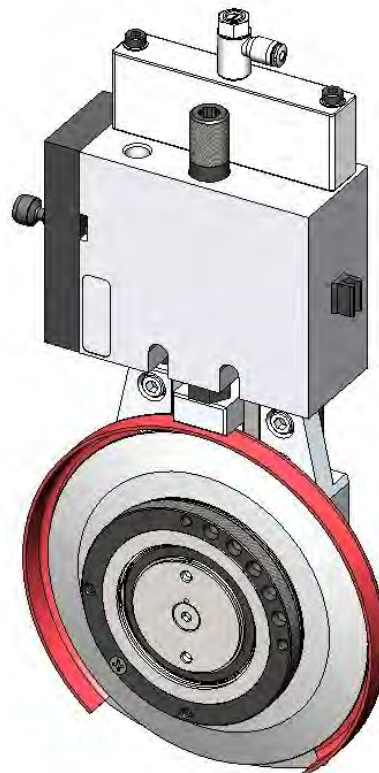
Operator Manual Installation Instruction

PSADF03_EN_01

Shear cut knife holder

PSA-DF

245AA22B



This manual contains important information concerning the safe use of the DIENES product.

The operator must ensure that all persons who are involved in installation, operation and maintenance have read and understood this manual.

The manual must be available at all times to the personnel - please keep it in close proximity to the system.

The original version of this manual was produced in the German language - all other language versions are translations.

This Dienes product has been designed and manufactured in accordance with the applicable basic safety requirements as per the machinery directive 2006/42/EC, and is intended for installation in a machine or production system. This results in interfaces to neighbouring components. The resulting hazards must be taken into consideration and evaluated by the manufacturer or operator, and suitable protective measures must be taken.

For this purpose, DIENES provides an installation declaration in accordance with appendix II part 2 section B of the machinery directive 2006/42/EC, for use during the certification of the machine or production system. Certification and CE marking are carried out by the manufacturer or operator of the machine or production system. This also applies if installation is carried out by or supervised by DIENES.

This product must not be started up until certification of the machine or production system has taken place.

If the product described here is resold in an unchanged form, it is essential that this operation manual is passed on to the new owner.

This operation manual or parts thereof must not be duplicated without written approval from DIENES Werke. The manual must not be handed to third parties. The manual must not be duplicated on electronic media.

The copyright to this operating manual remains vested in:

Dienes Werke, Overath.

Signal words



 **Danger !**

Denotes an immediate threat of danger. Death or extremely serious injuries will occur if it is not avoided.



 **Warning !**

Denotes a potentially dangerous situation. Serious injuries or death may occur if it is not avoided.



 **Caution !**

Denotes a potentially dangerous situation. Minor or slight injuries may occur if it is not avoided.



Caution !

Denotes a situation that will lead to damage to the device if it is not avoided.



Note

It is imperative that you observe this information.
It will help you in your daily work.

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2 Product Description

2.1 Intended use

The PSA-DF shear cut knife holder is intended exclusively for:

- Longitudinal cutting of a specified web of material in combination with driven lower knives.

Any other or further use is deemed non-intended use.

DIENES in Overath cannot be held liable for any resulting damage in such cases. The operator bears sole responsibility for the risk.

Intended use also includes observation of the operating manual, compliance with the operating, maintenance and repair specifications stipulated by the manufacturer, as well as exclusive usage of original DIENES spare parts.

If the cutting tool is not used according to these specifications, safe operation of the machine cannot be guaranteed.

It is the operator, not the DIENES company, who bears the responsibility for any injury to persons or damage to property resulting from improper use.

2.2 Description of the shear cut knife holder

The DIENES PSA-DF shear cut knife holder essentially consists of the assemblies shown in the following.

- P1 Compressed air connection (red)
- P2 Compressed air connection (blue)

- 1 Depth adjustment
- 2 Knife holder body
- 3 Dished knife
- 4 Knife head
- 5 360° safety hand guard
- 6 Clamping bolt
- 7 Latching bolt
- 8 Hand guard

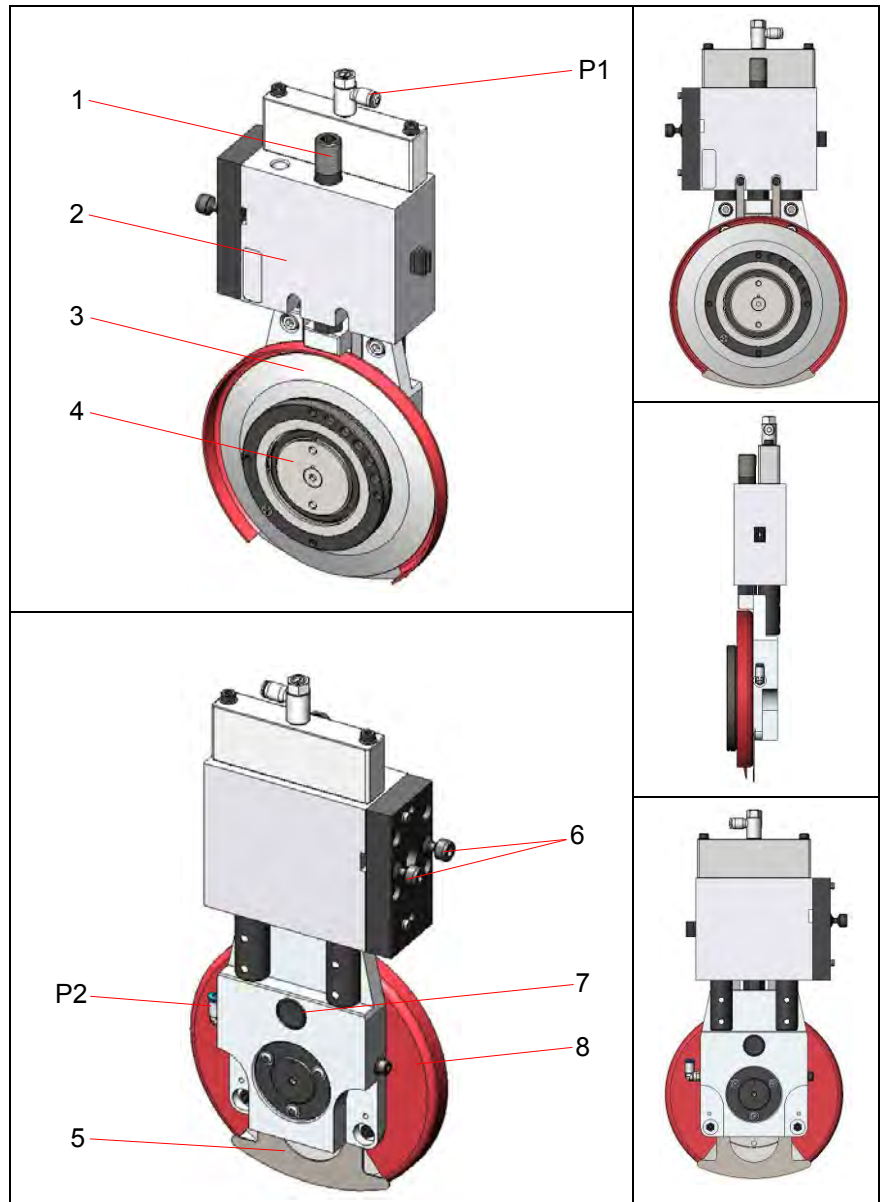


Fig. 1: Description of knife holder

Brand name "CONTROLLEUR", type: PSA-DF-SH-L-Z1 – Z4

complete, pneumatic

knife head left-hand type or right-hand type

for slitting widths from 50 mm

horizontal stroke 3 mm

with double guide and anti-twist protection

without dished knife, (D 150 x D 80 x 2.5 mm)

with hand guard

including 360° safety hand guard

with single depth adjustment

web entrance from the front or rear

2.3 Product data

2.3.1 Technical Data

Name	Shear cut knife holder
Type	PSA-DF-SH-Z1-Z4
Item no.	245AA22B01
Weight approx. *1	approx. 5 kg
Height *1	approx. 340 mm
Width *1	approx. 58 mm
Depth *1	approx. 161 mm
Vertical stroke	25 mm
Compressed air load for vertical stroke	4 – 6 bar
Horizontal stroke	3 mm
Compressed air supply for horizontal stroke	4 – 6 bar
Knife dimensions	Ø 150 x Ø 80 x 2.5 mm
Slitting width *1	from 50 mm
Application range	max. 1200 m/min

*1 can vary according to options

2.3.2 Energy supply

The customer is responsible for providing a supply of voltage and compressed air for the operation of the positioning device.

The compressed air must be dry, filtered and free from oil. It must be conditioned in compliance with

- ISO 8573-1:2010 Class 7 for particle size
- ISO 8573-1:2010 Class 2 for bio-oils
- ISO 8573-1:2010 Class 4 for mineral oils

2.3.2.1 Knife holder

Required excess pressures		
Knife holder vertical stroke	4 – 6	bar
Knife holder horizontal stroke	4 – 6	bar

Note

The required cutting pressure depends on the cutting speed and the composition of the material and must be determined under production conditions.

However, the cutting pressure should not be higher than that required to reliably cut the material web.

2.3.3 Prestressing forces and tightening torques for metric screws

The permissible torques listed in the table below are to be understood only as approximate recommended values and are not binding - see VDI 2230!

Tightening torques for steel set screws

DIN 912 / 931 / 933 / 934 strength classes 8.8 - 12.9

The table values for MA consider: a) Friction value $q_{tot}=0.14$, b) utilisation of the minimum yield strength=90%, c) torsion torque when tightening the frictional coefficient of $q_{tot}=0.14$ applies for the delivered version of screws and nuts without coating, lightly oiled.

Additional lubrication of the threads alters the frictional coefficient considerably and leads to uncertain tightening conditions! Tightening methods and tools have different dispersions (see Tab.1/VDI 2230).

Standard thread

Dimension	Pitch P	Tension cross section As / mm ²	Prestressing force FV (N)			Tightening torque Ma (Nm)		
			8.8	10.9	12.9	8.8	10.9	12.9
M 4	0,7	8,78	3900	5700	6700	3,0	4,4	5,1
M 5	0,8	14,2	6400	9300	10900	5,9	8,7	10
M 6	1,0	20,1	9000	13200	15400	10	15	18
M 8	1,25	36,6	16500	24200	28500	25	36	43
M 10	1,5	58,0	26000	38500	45000	49	72	84
M 12	1,75	84,3	38500	56000	66000	85	125	145
M 14	2,0	115	53000	77000	90000	135	200	235
M 16	2,0	157	72000	106000	124000	210	310	365
M 18	2,5	193	91000	129000	151000	300	430	500
M 20	2,5	245	117000	166000	194000	425	610	710
M 22	2,5	303	146000	208000	243000	580	830	970
M 24	3,0	353	168000	239000	280000	730	1050	1220
M 27	3,0	459	221000	315000	370000	1100	1550	1800
M 30	3,5	561	270000	385000	450000	1450	2100	2450
M 33	3,5	694	335000	480000	560000	2000	2800	3400
M 36	4,0	817	395000	560000	660000	2600	3700	4300
M 39	4,0	976	475000	670000	790000	3400	4800	5600

Fig. 2: Tightening torque standard threads

Fine thread

Dimension	Pitch P	Tension cross section As / mm ²	Prestressing force FV (N)			Tightening torque Ma (Nm)		
			8.8	10.9	12.9	8.8	10.9	12.9
M 8	x 1	39,2	18100	26500	31000	27	40	47
M 10	x 1,25	61,2	28500	41500	48500	54	79	93
M 12	x 1,25	92,1	43000	64000	74000	96	140	165
M 12	x 1,5	88,1	40500	60000	70000	92	135	155
M 14	x 1,5	125	58000	86000	100000	150	220	260
M 16	x 1,5	167	79000	116000	136000	230	340	390
M 18	x 1,5	216	106000	152000	177000	350	490	580
M 20	x 1,5	272	134000	191000	224000	480	690	800
M 22	x 1,5	333	166000	236000	275000	640	920	1070
M 24	x 2	384	189000	270000	315000	810	1160	1350
M 27	x 2	496	245000	350000	410000	1190	1700	2000
M 30	x 2	621	309000	440000	515000	1610	2300	2690

Fig. 3: Tightening torques fine threads

3 Safety

3.1 Operator's duty of care

The operator must ensure that all persons commissioned with installation, operation or maintenance work have read and understood the instructions in this manual.

The manual must be available to the personnel at all times; keep the manual in the vicinity of the system.

All persons working with the product must observe the instructions in this manual, in particular the safety instructions, as well as the rules and regulations applicable for the site.

The generally accepted legal and other regulations and provisions pertaining to the prevention of accidents (e.g. protective equipment) and environmental protection must also be observed in addition to the safety instructions mentioned in this manual.

Serious physical injury or damage to property can result in the event of unqualified interventions in the device or failure to observe the warning instructions given in this documentation or on the device. Accordingly, only personnel with the relevant qualifications may undertake interventions on this device.

Qualified personnel as defined in the safety-related instructions in this documentation or on the product itself are those persons who

- have undergone a course of instruction as operators handling knife holders or cutting systems and are familiar with the operation-related content of this documentation;
- or maintenance and service personnel who are qualified to repair such knife holders or who are licensed to operate knife holders in accordance with safety engineering standards.

i Note!

Only personnel with the relevant qualifications may undertake interventions on this device. These employees must be thoroughly acquainted with all sources of danger and maintenance measures in accordance with the information in this documentation. A prerequisite for perfect and safe operation of the product is correct transport, correct storage, assembly and set-up, as well as care in use and maintenance.

3.1.1 EC Machinery Directive

This DIENES product is designed and manufactured in accordance with the applicable basic safety requirements as per the Machinery Directive 2006/42/EC and is intended for installation in a machine or production facility. This involves interfaces to neighbouring components. The manufacturer or operator is liable for taking the resulting hazards into consideration and assessing these and undertaking suitable protective measures.

For this purpose DIENES provides a Declaration of Incorporation in accordance with Annex II Part 1 Section B of the Machinery Directive 2006/42/EC used for the certification of the machine or production facility. Certification and CE-marking are effected by the manufacturer or operator of the machine or production facility. This is also applies to the assembly or supervision of the assembly by DIENES.

Commissioning of the product is prohibited until such time as certification of the machine or production facility has been completed.

3.1.2 Hazards state-of-the-art technology

The DIENES product has been manufactured in accordance with the state of the art and in accordance with the recognised technical safety regulations.

The product is only to be operated if in technically good order and condition as well as according to intended use, with safety and risk-awareness and by observing the operating manual. In particular, any faults which can have a detrimental effect on safety need to be rectified or have to be resolved by a third party.

3.1.3 Reasonably foreseeable misuse

Every use that exceeds maximum performance data is regarded as improper use and is therefore prohibited.

3.1.4 Warranty and liability

Warranty and liability claims for potential personal injury or property damage are excluded

- in compliance with contractual or legal provisions
- in the event of incorrect or improper transport
- in the event of incorrect or improper storage
- in the case of operation that exceeds the specific performance data
- in the event of improper / non-intended use of the product
- in the event of arbitrary and unauthorised modifications
- where maintenance work is not carried out or improperly executed
- in the case of damaged sealing wax / seals
- in the event of non-observance of Dienes specifications for new and reground knives

3.1.5 Spare parts and accessories

We point out that parts and accessories not supplied by DIENES as spare parts and accessories have not been tested and approved by us. Installing or attaching as well the use of such products may possibly influence the constructive specific properties of the system. The manufacturer bears no liability for damage caused through the use of parts and accessories that are not original parts and accessories.

3.2 General safety notices



Danger!

Voltage

Faulty electrical connections or unapproved live parts result in serious injury or even death.

- Electrical connections must only be carried out by qualified personnel.
- Any damaged cables or plugs need to be replaced immediately.



Warning!

Objects tossed around by rotating parts can cause serious injury or even death.

- Remove objects and tools from rotating parts before putting these into operation.



Warning!

Entanglement hazard

Rotating parts can pull in parts of the body and cause severe injuries or even death.

- Keep a sufficient distance to rotating machine components.
- Safeguard the machine against restarting and unintended movement during assembly and maintenance work.



Caution!

Cutting hazard



There is a risk of being cut in the area of the knife edge.

- Always wear protective gloves when working on the knife holder.
- Safeguard the product against restarting and unintended movement during assembly and maintenance work.



Caution!

Crushing hazard

There is a risk of being crushed in the vicinity of the pneumatically controlled knife holders.

- Safeguard the product against restarting and unintended movement during assembly and maintenance work.

**Caution!****Hot surfaces**

Hot machine parts can cause serious burns.













- Only ever touch machine parts while wearing protective gloves or after the machine has been shutdown for a longer period of time.

**Caution!****Laser radiation**

- Avoid radiation of the eyes or skin by direct or scattered radiation.

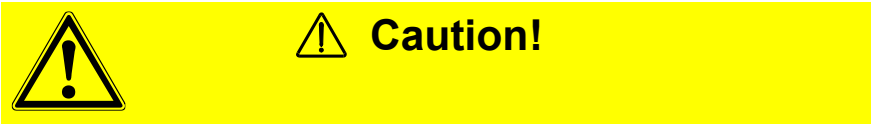
3.2.1 Explanation of the safety symbols used

Pictograms warn you against dangers and provide useful notes on safe use:

-  **General hazards**
-    **Cutting hazard**
-  **Electric current hazard**
-  **Rotating machine parts
Crushing and entanglement hazard**
-  **Warning against hand injuries**
-  **Warning against hot surfaces**
-  **Warning against laser radiation**
-  **Damage to the device**
-  **Lubricating specifications**
-  **Note
Information for daily use**

3.2.2 Affixed warnings and protective devices

The affixed warnings must be observed at all times.



It is very important to remind the operating personnel to make themselves familiar with the position of the individual emergency stop switches before operating the system.



Rotating parts can pull in parts of the body and cause severe injuries or even death.

- Keep a sufficient distance to rotating machine components.
- Safeguard the machine against restarting and unintended movement during installation and maintenance work.

- This label is attached to each knife holder.
- It warns that sharp cutting tools are in operation, and to keep clear of the blade during operation.



Fig. 4: Warning sign on the knife holder

- 1 Hand guard
- 2 Top knife
- 3 360° safety hand guard

The 360° safety hand guard protrudes over the dished knife in the rest position.

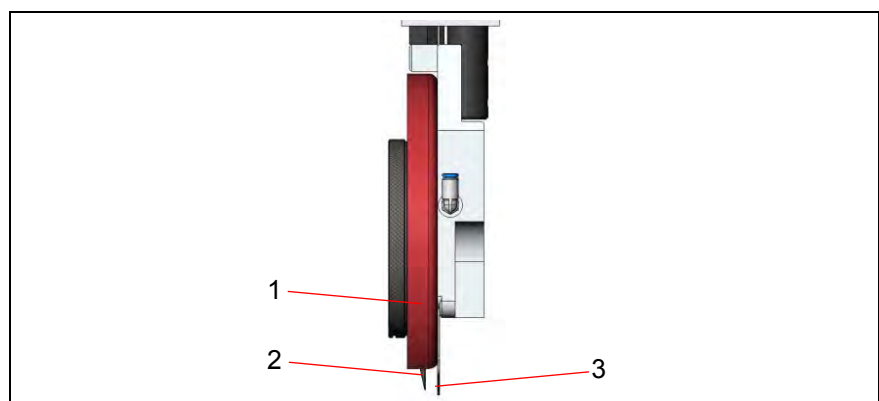


Fig. 5: 360° safety hand guard

Notice

As this knife holder is only part of a complete system, the operator of the system is responsible for safeguarding the system during operation.

This can be achieved by fitting light curtains or safety gates, for example.

All warnings and protective devices must be checked at least once a week to make sure they are present and in proper working order.

3.3 Personal safety equipment



“Dienes” safety gloves must always be worn when working on the cutting tools.

(Dienes Order No. =0FHANDS000001)

4 Commissioning

4.1 Interfaces to neighbouring machine components

The DIENES product is designed and manufactured in accordance with applicable basic safety requirements so that it presents no immediate essential danger.

There are interfaces to neighbouring components due to the fact that the DIENES product is intended for incorporation in an existing machine or production facility.

Any existing shaft or other machine parts that give rise to serious hazards in combination with the DIENES products must be given particular consideration here.

The manufacturer is responsible for taking the resulting hazards into consideration and assessing these and undertaking suitable protective measures.

Commissioning is prohibited until such time as the operator has ensured that the complete system complies with the applicable safety requirements.

4.2 Transport

Note!

Individual knife holder types can weigh in excess of 25kg. Weight information can be found in the technical data. Use suitable lifting gear if necessary.



Extreme care and caution must always be taken when working on the knife holder.

When the knife holder is being transported it must be ensured that the knife cannot rotate, and that the knife edge is covered.

- Always wear protective gloves when working on the knife holder. (Dienes order no.: 0FHANDS000001)



Protect knife from slipping and knocks, since any knock will damage the knife edge.

4.3 Assembly

4.3.1 Holder alignment and hole pattern



Extreme care and caution must be taken when working with the shear cut knife holder.

- Always wear protective gloves when working on the knife holder. (Dienes order no.: 0FHANDS000001)
- Safeguard the machine against restarting and unintended movement.



It is imperative to pay attention to the position of the shear angle plate. See also Checking the shear angle.

- 1 Knife holder body
- 2 Centering pin
- 3 Clamping bolt

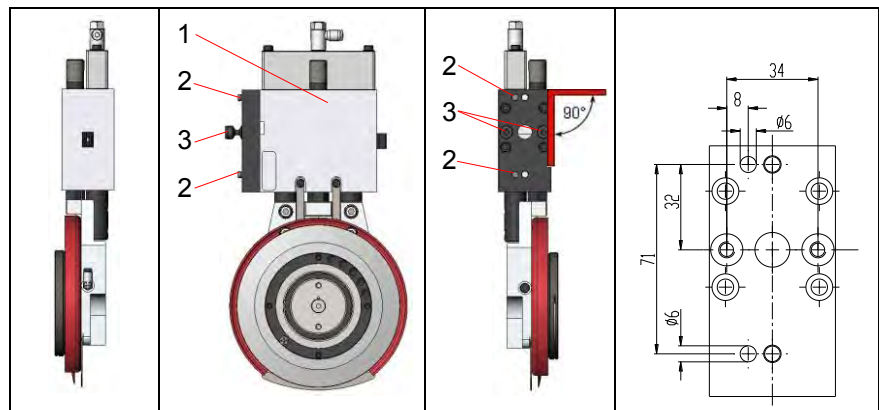


Fig. 6: Holder alignment and hole pattern

i Note

When mounting the knife holder take care that the holder is aligned at right angles.

Please take note of the following information concerning web guidance and shear angle positioning.

Dovetail and linear adaptors are available as an option from the Dienes company.

i Note

The product shown here is only intended to illustrate the principle and may differ from the product in question.

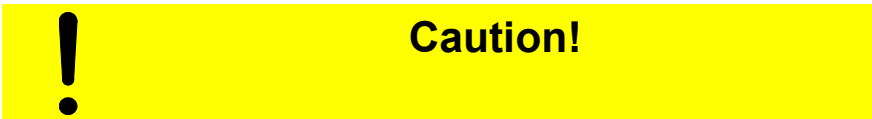
4.4 Commissioning



Warning

Before commissioning takes place it must be ensured that the specified pneumatic pressures and electric voltages are not exceeded, in order to prevent potential damage or injuries.

Unintentional operation is extremely dangerous for the operating personnel.



Caution!

Before the quick-release couplings are plugged into the compressed air supply rails of the machine, it must be ensured that the system is depressurised.

If this is not the case the top knife may be destroyed by its colliding with bottom knife, and the bottom knife may also be damaged.

Suitable pressure adjustment and throttle devices must be provided.

All clamping units on both the top knife holders and bottom knife motors must be tightened

4.4.1 Parameter settings for top and bottom knives

Care must be taken that the top knife and bottom knife are aligned correctly to each other. The cutting position is determined by the bottom knife cutting edge.

Align the knife holder to the bottom knife in compliance with the standard values indicated. (see Format adjustment)

In the idle position the axial distance between the top knife and the bottom knife must be 0.5 mm.

The depth adjustment must be set in such a way that the top knife immerses approx. 0.8 mm below the bottom knife with a completed vertical lift.

- 1 Top knife
- 2 Gauge
- 3 Bottom knife

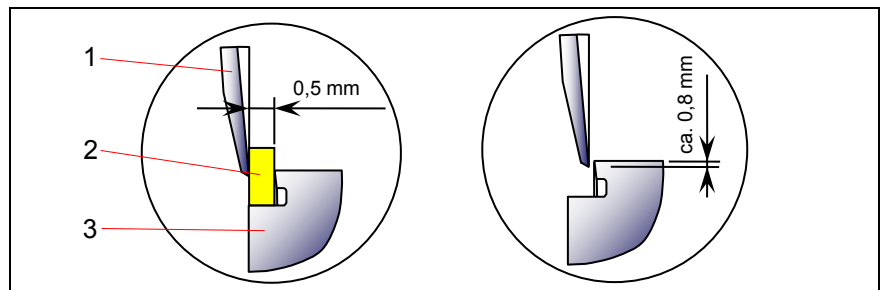


Fig. 7: Parameter settings, standard values between top knife and bottom knife

i Note

The values indicated here are standard values and may vary under production conditions.

4.4.2 Connection of the compressed air supply



Caution

Before the quick-release couplings are plugged into the compressed air supply rails of the machine, it must be ensured that the system is depressurised.

Suitable pressure adjustment and throttle devices must be provided.

The compressed air is supplied via hose connections between the supply channel and the knife holder (colour coded).

- 1 Compressed air connection P1 vertical stroke red
- 2 Compressed air connection P2 horizontal stroke blue

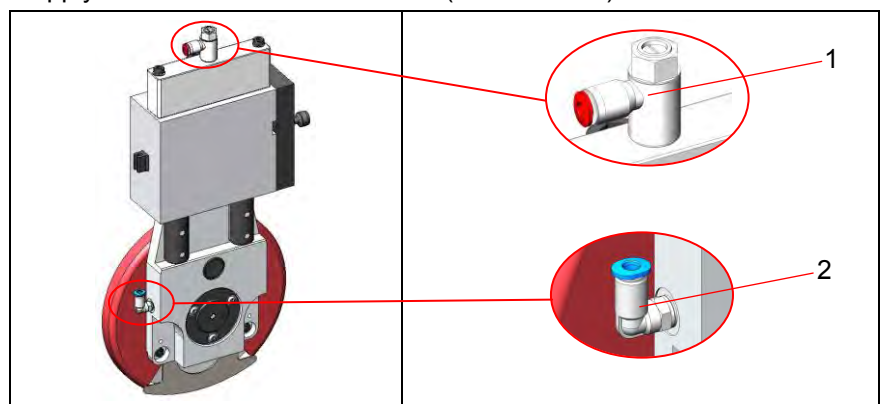


Fig. 8: Compressed air supply



Please note

The feed movement must be in the correct sequence. The vertical stroke must be carried out first, and when this is fully extended the horizontal stroke. During the retraction movement, the horizontal lift must be carried out first, followed by the vertical lift.

You will find information concerning connecting the compressed air in the chapter Power Supply.

The amount of supply pressure that is required depends mainly on the material that is being cut and the operating speed, and must be individually determined during commissioning under production conditions.

5 Handling and operation

5.1 Safety instructions for the operator



Warning !

It is imperative that the following safety instructions are observed when operating the machine – this will prevent fatal personal injuries, damage to the machines, other material damage and damage to the environment.

Under no circumstances put your hand into the machine while it is in operation!



Caution !

Cutting and crushing hazard



In case of careless handling, the operating personnel is exposed to considerable risk in the traversing range of the positioning slides of the pneumatically controlled knife holders.

“Dienes” safety gloves must always be worn when working on the cutting tools.

(Dienes Order no.: 0FHANDS000001)



Caution !

All clamp levers and screws that have been unscrewed during a change of format must be firmly tightened again afterwards.



Note

The accident prevention regulations must be observed.

Safeguard an ample space around the working area before starting adjustment work.

The sequence of the prescribed work steps must be observed exactly.

The knife holders must always be depressurised when work is being carried out on them.

In the case of swivelling systems it must be ensured that these are operated without vibration and are gently swivelled into the end positions.

The slitting system may only be operated by trained and authorised operating personnel.

The operating instructions must be observed exactly.

5.1.1 Qualification of personnel

Qualified personnel as defined in the safety-related instructions in this documentation or on the product itself are those persons who

- have undergone a course of instruction as operators handling knife holders or cutting systems and are familiar with the operation-related content of this documentation;
- or maintenance and service personnel who are qualified to repair such knife holders or who are licensed to operate knife holders in accordance with safety engineering standards.

5.2 Definition of the knife holder

The knife holder is defined via the knife head position and the direction of the web entry. A difference is made between the knife head position left or right and the web entry from the front or the rear.

This is the basis for the four possible installation positions of the knife holders with drawing horizontal lift (Z1 – Z4).

5.2.1 Knife holder Z1, drawing horizontal lift

- 1 View from the front
- 2 Web entrance from the front
- 3 Web entrance from the rear
- 4 Knife head position left
- 5 Knife head position right
- 6 Shear angle plate
- 7 Horizontal lift drawing

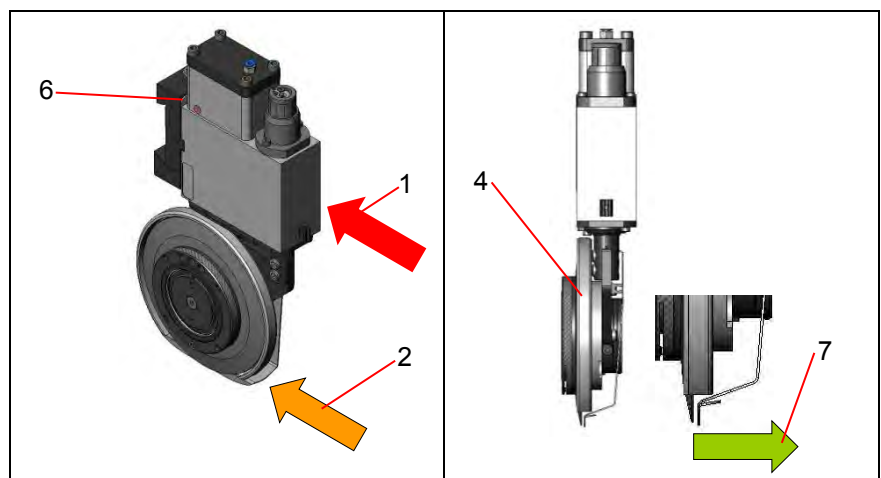


Fig. 9: Z1 = Knife head left, web entrance from the front

5.2.2 Knife holder Z2, drawing horizontal lift

- 1 View from the front
- 2 Web entrance from the front
- 3 Web entrance from the rear
- 4 Knife head position left
- 5 Knife head position right
- 6 Shear angle plate
- 7 Horizontal lift drawing

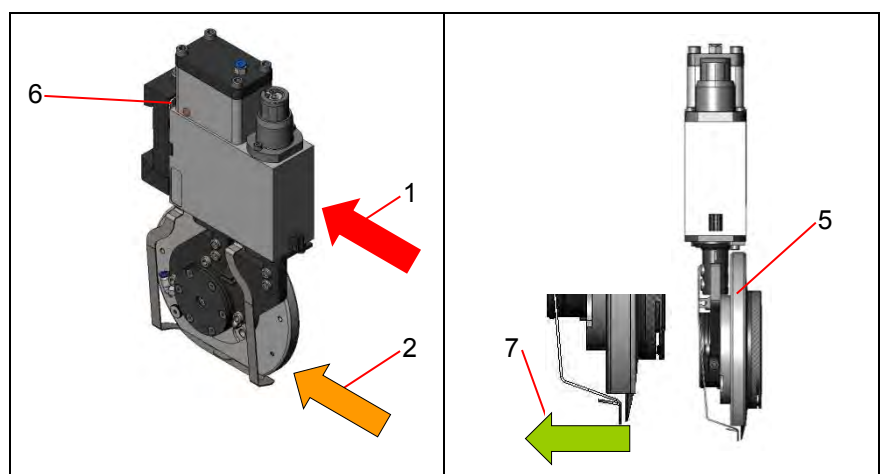


Fig. 10: Z2 = Knife head right, web entrance from the front

5.2.3 Knife holder Z3, drawing horizontal lift

- 1 View from the front
- 2 Web entrance from the front
- 3 Web entrance from the rear
- 4 Knife head position left
- 5 Knife head position right
- 6 Shear angle plate
- 7 Horizontal lift drawing

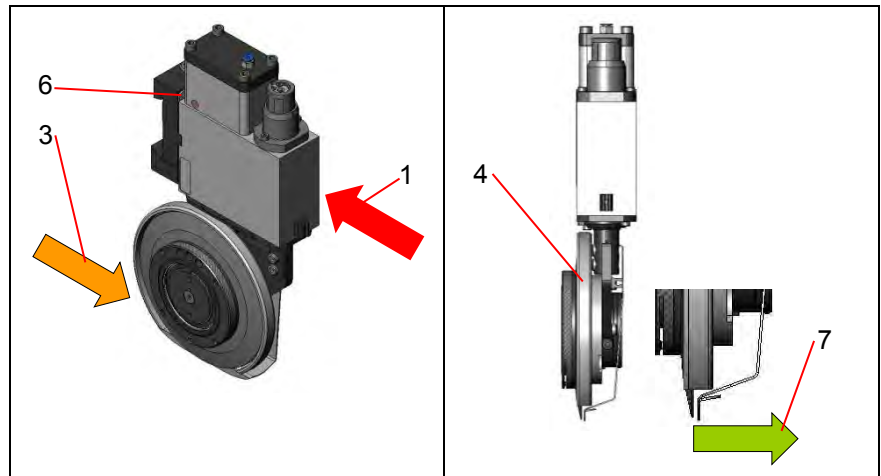


Fig. 11: Z3 = Knife head left, web entrance from the rear

5.2.4 Knife holder Z4, drawing horizontal lift

- 1 View from the front
- 2 Web entrance from the front
- 3 Web entrance from the rear
- 4 Knife head position left
- 5 Knife head position right
- 6 Shear angle plate
- 7 Horizontal lift drawing

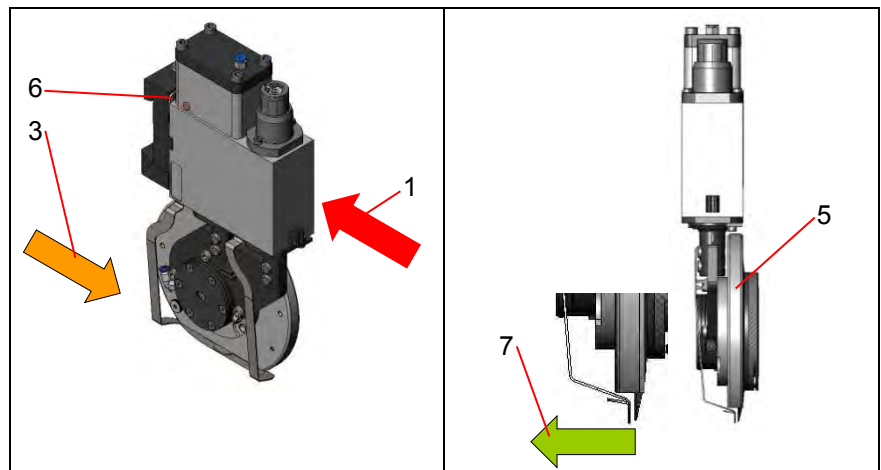


Fig. 12: Z4 = Knife head right, web entrance from the rear

i Note

It is imperative to observe the position of the shear angle plate in dependence on the position of the knife head and the direction of web entry.

The knife holders shown here are intended to illustrate the principle and may differ from the product in question.

5.3 Type of material guide

5.3.1 Tangential

The knife holder is aligned at 90° to the web.

- 1 Top knife
- 2 Bottom knife

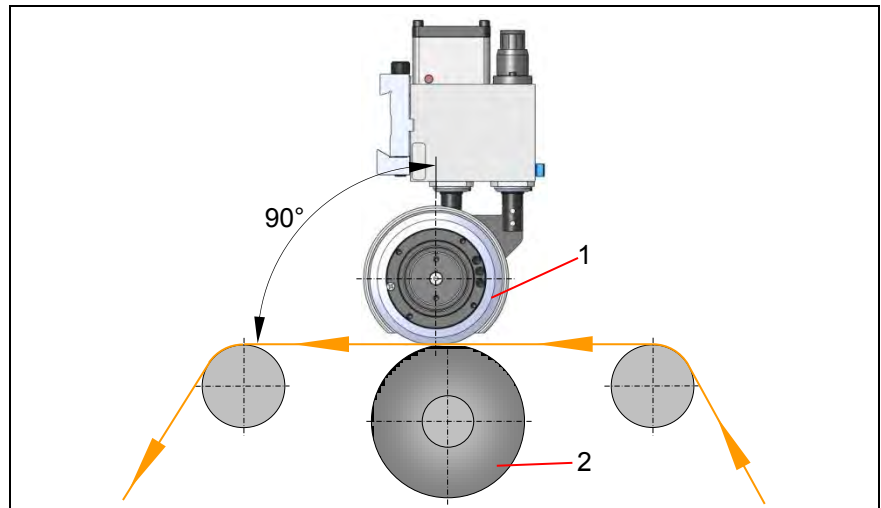


Fig. 13: Web tangential (schematic diagram)

5.3.2 Wrapped

The knife holder is located within the wrapping angle "W".

- 1 Top knife
- 2 Bottom knife

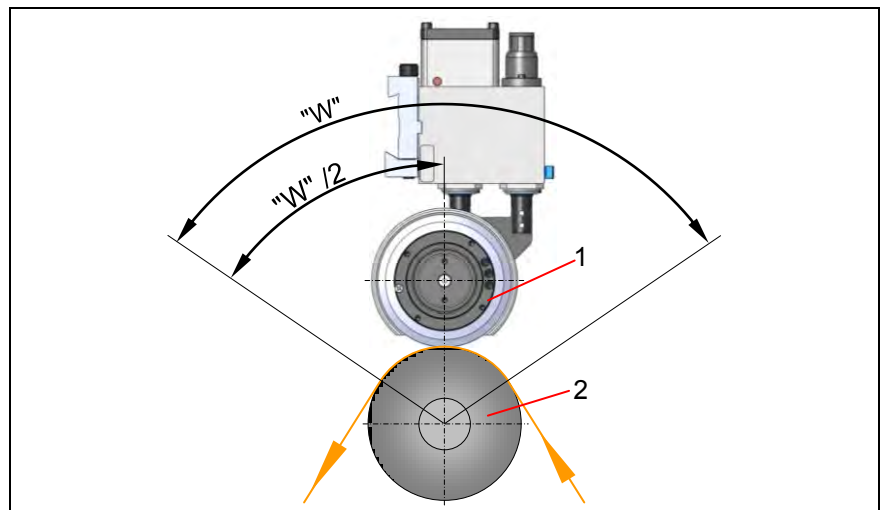


Fig. 14: Web entrance wrapped (schematic diagram)

5.3.3 Determining the axial offset

i Note!

Observing the axial offset is only relevant when using a tangential cut.

- 1 Top knife
- 2 Bottom knife
- 3 Web entrance from the front
- 4 Web entrance from the rear
- 5 Axial offset

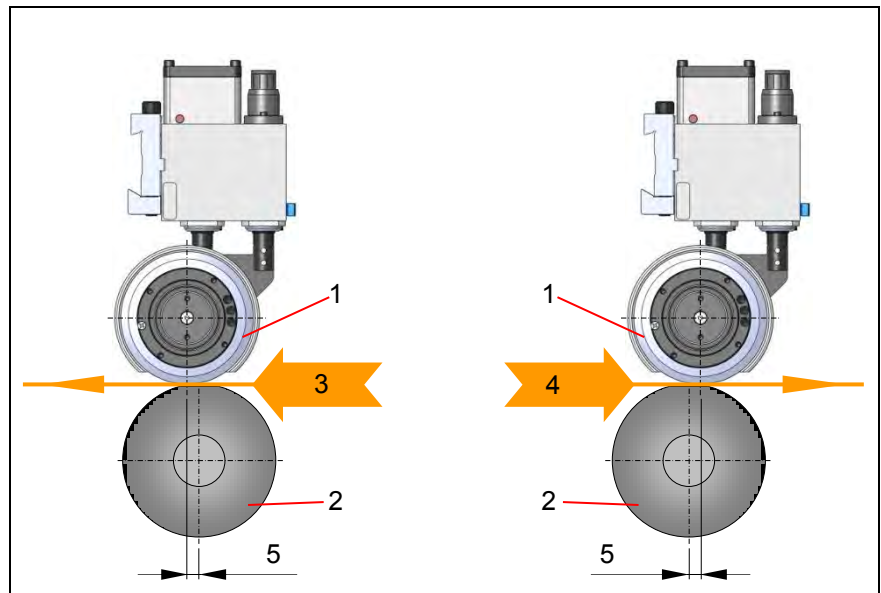


Fig. 15: Axial offset (schematic diagram)

You will find the standard values for axial offset in the table below.

These mainly comply with the diameter of the top knife and the depth of immersion.

When determining the standard values, a depth of immersion of 0.8 mm is assumed.

Ø Top knife	Ø Bottom knife	Axial offset
105 mm	140 – 250 mm	9.130 mm
130 mm	150 – 250 mm	10.167 mm
150 mm		10.925 mm
180 mm	200 – 300 mm	11.973 mm
200 mm		12.624 mm

Please contact the DIENES company if you require more information concerning other knife pairs and depths of immersion.

5.4 Alignment of the shear angle plate

A shear angle plate is used to adjust the shear angle.

The alignment of the shear angle plate depends on the two possible knife head positions (left or right) and the two possible web direction entrances (from the front or the rear). This results in four possible installation positions for the knife holder (Z1 – Z4).

5.4.1 Web entrance from the front, drawing horizontal lift (Z1 and Z2)

- 1 Crossbar (machine frame)
- 2 Dovetail rail
- 3 Adapter
- 4 Shear angle plate
- 5 Knife holder
- 6 Depth adjustment
- 7 Web entrance from the front
- 8 Top knife
- 9 Bottom knife
- 10 Shear angle plate (top view enlarged)
- 11 Web entrance from the rear

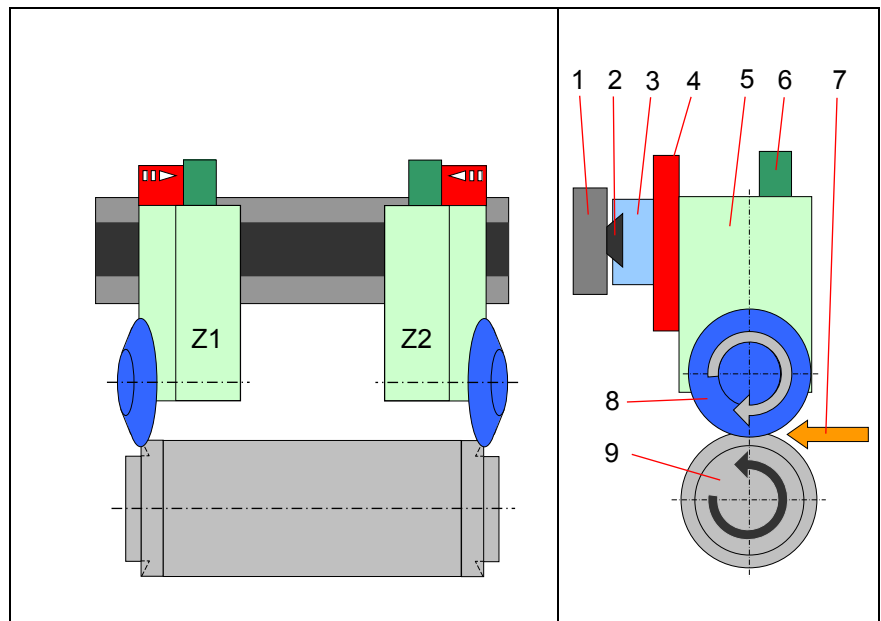


Fig. 16: View from the front

Side view

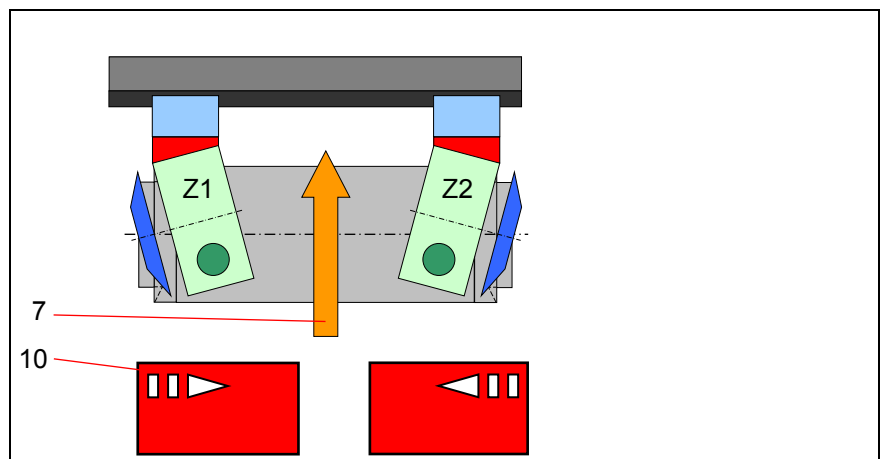


Fig. 17: Top view

5.4.2 Web entrance from the rear, drawing horizontal lift (Z3 and Z4)

- 1 Crossbar (machine frame)
- 2 Dovetail rail
- 3 Adapter
- 4 Shear angle plate
- 5 Knife holder
- 6 Depth adjustment
- 7 Web entrance from the front
- 8 Top knife
- 9 Bottom knife
- 10 Shear angle plate (top view enlarged)
- 11 Web entrance from the rear

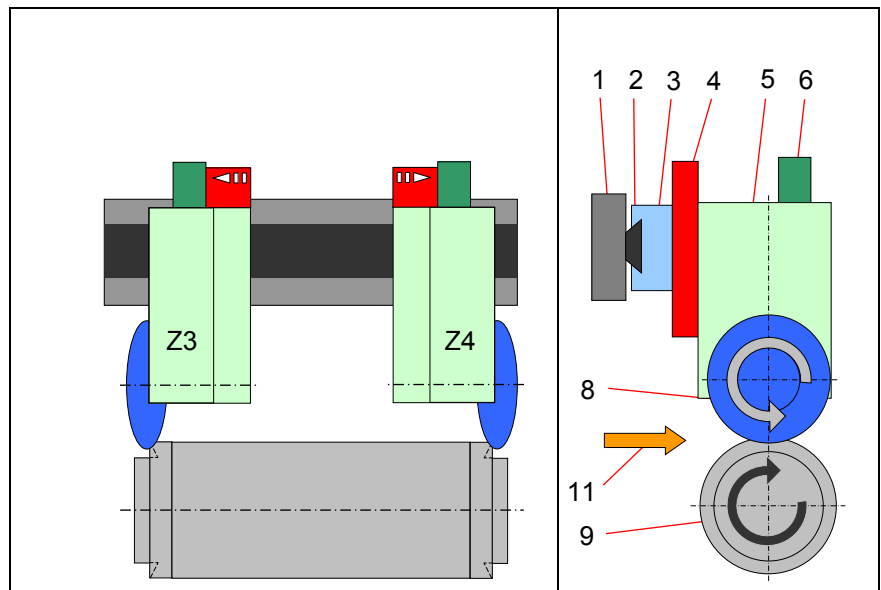


Fig. 18: View from the front

Side view

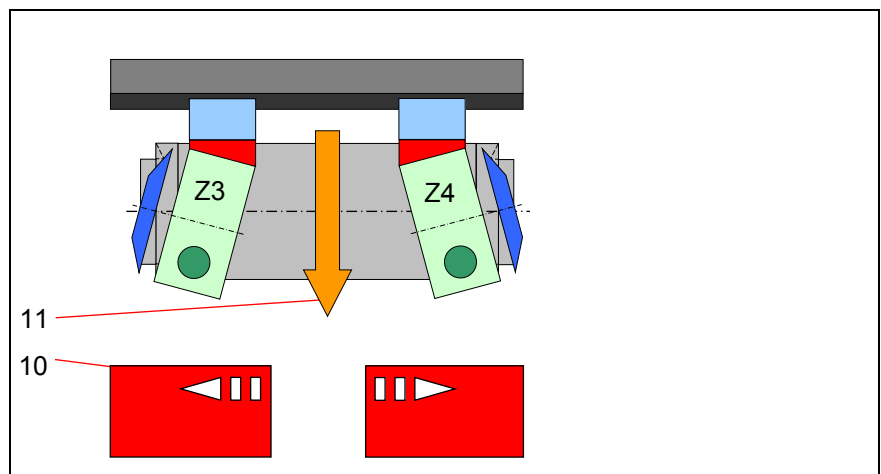


Fig. 19: Top view

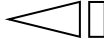



5.4.3 Adjustment of the shear angle

An angle plate, inserted between the knife holder and the adapter, is used to adjust the shear angle.

In order to change the angle plate, the shear cut knife holder must be separated from the adapter. This allows access to the angle plate, which can then be removed.

While replacing the angle plate, care must be taken that the new angle plate is inserted in compliance with the web entrance and the necessary shear angle.

The shear angle can be identified by the marking on the angle plate (see table).

Shear angle "W"	Marking
0	not applicable
15'	
30'	
45'	
1°	

5.5 Adjusting the knife holder

5.5.1 Drawing of the shear cut knife holder



There is a risk of being cut in the area of the knife edge.

- Always wear protective gloves when working on the knife holder. (Dienes order no.: 0FHANDS000001)
- Safeguard the machine against restarting and unintended movement.

- P1 Compressed air connection
red (4 – 6 bar)
- P2 Compressed air connection
blue (4 – 6 bar)
- 1 Knife holder body
- 2 Clamping bolt
- 3 Dished knife
- 4 Ring nut
- 5 Knife head
- 6 Safety screw
- 7 Depth adjustment
- 8 Hand guard
- 9 Disc spring package
- 10 Web entrance from the rear
- 11 Web entrance from the front

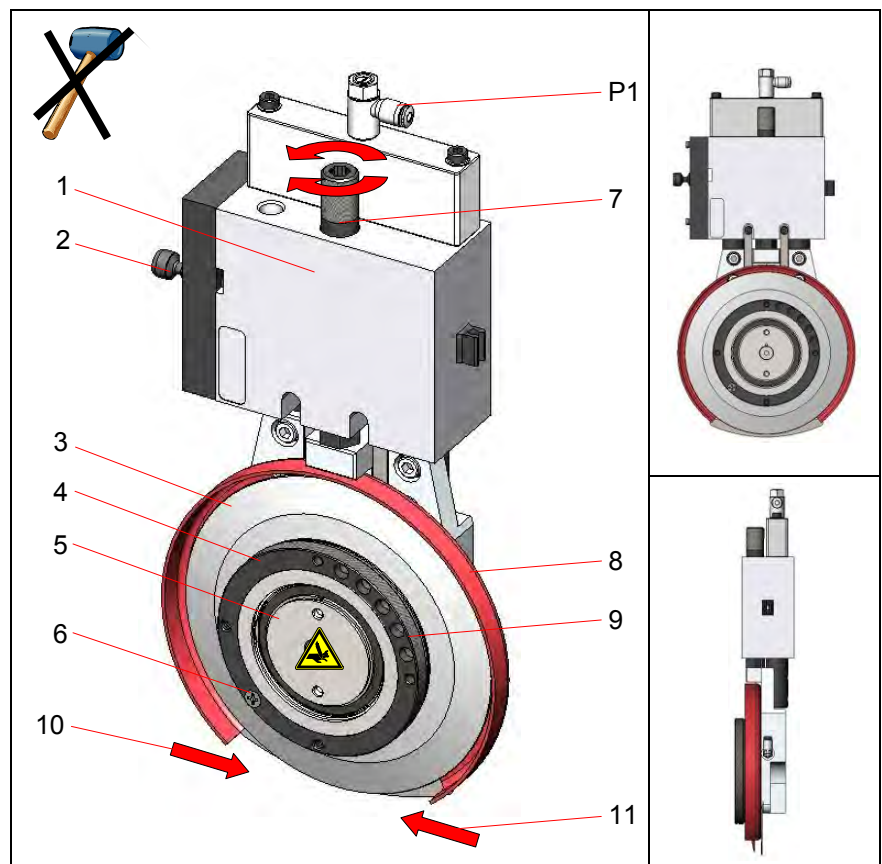


Fig. 20: Diagram of knife holder

- 12 Horizontal stroke slitting force regulation limit
- 13 360° safety hand guard
- 14 Latching bolt

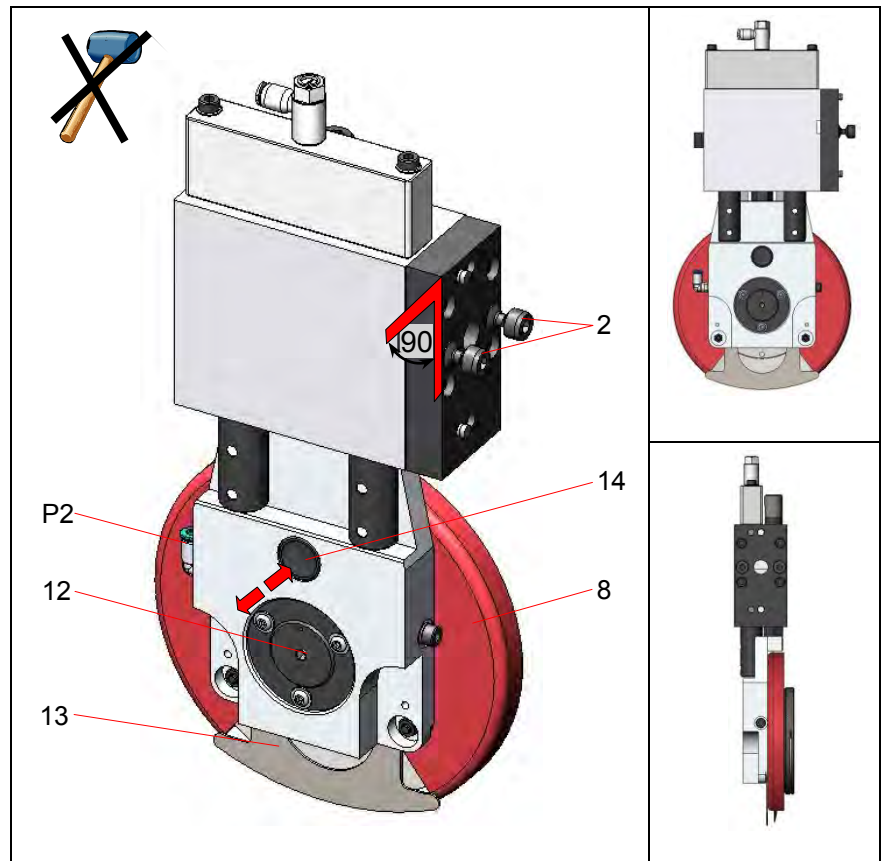


Fig. 21: Diagram of knife holder

5.5.2 Setting the overlap depth

The overlap depth must be set after a knife replacement where different knife diameters are used. The 0.8 mm value indicated here is a standard value that can vary depending on the material to be cut and the cutting speed.



There is a risk of being cut in the area of the knife edge. Setting the overlap depth requires great care.

- Always wear protective gloves when working on the knife holder. (Dienes order no.: 0FHANDS000001)
- Safeguard the machine against restarting and unintended movement.



Before the quick-release couplings are plugged into the compressed air supply rails of the machine, it must be ensured that the system is depressurised. If this is not the case, the tool may be destroyed by the top knife colliding with the bottom knife, and the bottom knife may also be damaged.

i Note

The reference values indicated here may vary under production conditions or might have to be adapted to the cutting material requirements.

- 1 Dished knife
- 2 Bottom knife

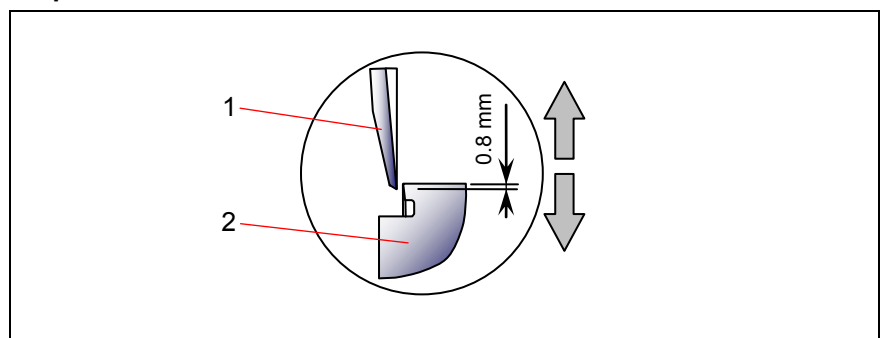


Fig. 22: Parameter settings, standard values top knife to bottom knife

The steps for setting the overlap depth are described below.

P1 Compressed air connection
P1

1 Depth adjusting screw

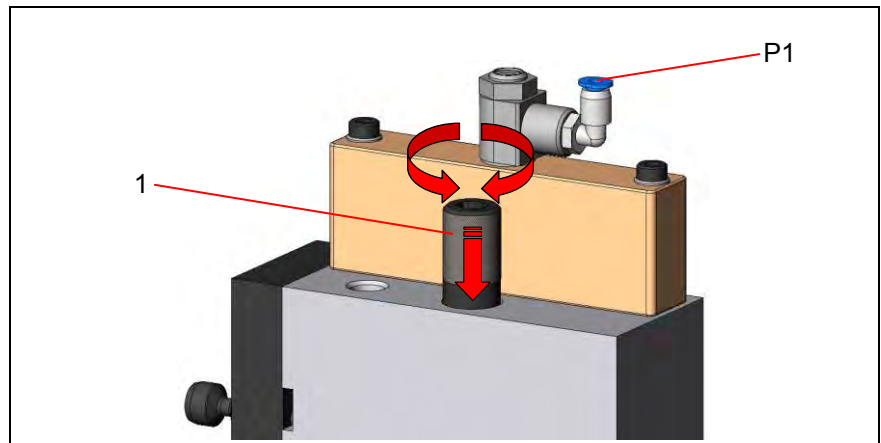


Fig. 23: Depth adjustment (fig. similar)

1. Position the knife holder so that the dished knife is positioned laterally next to the bottom knife cutting edge and above the cutting groove.
2. Screw in the adjusting screws for depth adjustment up to the limit stop.
3. Apply pressure to the knife holder on connection P1. The knife holder will execute the specified vertical lift.
4. Measure the distance between bottom knife and dished knife. Shut off compressed air. Unscrew the adjusting screw in small steps.
5. Repeat steps 3 and 4 until the required overlap depth is achieved. This completes the work and the knife holder is ready for operation again.

5.5.3 Adjusting the slitting force



Caution!

Knife holder adjustment must be carried out with extreme care. “Dienes” safety gloves must always be worn when working on the slitting tools.

(Dienes order no.: 0FHANDS000001)

The required cutting pressure depends on the cutting speed and the composition of the material web, and must be determined under production conditions.

However, the cutting pressure should only be set as high as is necessary to cut the material web with certainty.

The slitting force is the result of the axial distance between the top knife and the bottom knife, the disc spring package and the stroke limiter.

- 1 Cover
- 2 Threaded pin
- 3 Allen key
- 4 Return spring

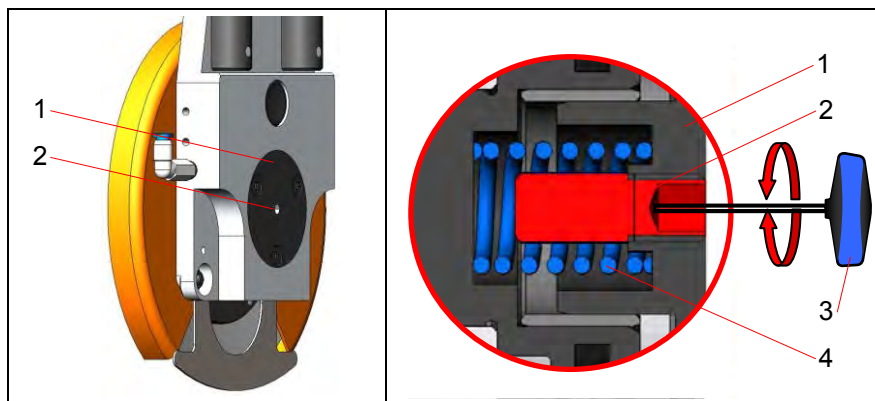


Fig. 24: Stroke limiter slitting force limiter

1. Position the knife holders axially.
2. Screw the threaded pin 2 in as far as it will go in order to block the lateral stroke.
3. Establish the compressed air connection and apply 4 - 6 bar pressure to the knife holder. The knife holder only carries out the vertical stroke. (Ensure that the stroke is fully extended).
4. Unscrew the threaded pin until the top knife is in contact with the bottom knife. Then unscrew the threaded pin by another 1 - 2 turns (max. until threaded pin is flush with the cover). This completes the work and the holder is ready for operation again.



Note

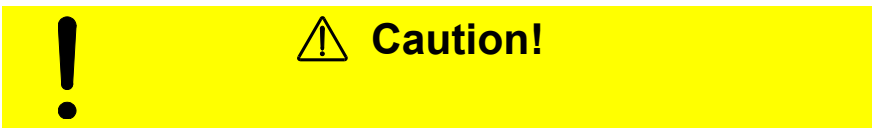
All knife holders must have the same axial distance to the bottom knives.

5.6 Knife replacement PSA-DF



There is a risk of being cut in the area of the knife edge.

- Always wear protective gloves when working on the knife holder. (Dienes order no.: 0FHANDS000001)
- Safeguard the machine against restarting and unintended movement.



When cleaning the knife collar, please ensure that no cleaning agent penetrates the bearings. Non-compliance will result in premature failure of the knife holder.

Utmost cleanliness is important while working, since jammed dirt particles affect the lateral trueness of the knife.

Check the new or newly ground knives for true running and lateral deviation after fitting.

- 1 Ring nut
- 2 Spring pack
- 3 Safety screw
- 4 Dished knife
- 5 Latching bolt
- 6 Threaded pin for stroke limiter

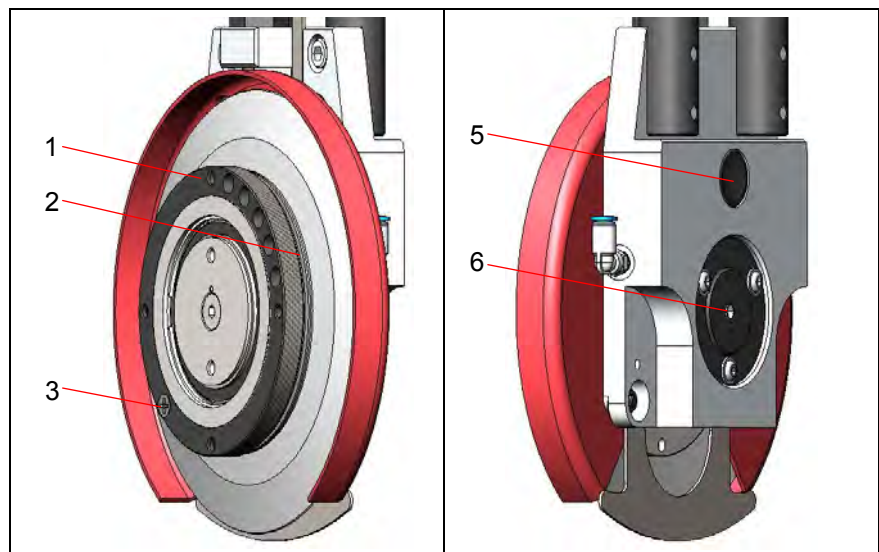


Fig. 25: Knife replacement

1. Disconnect the compressed air supply and protect it against being connected again accidentally.

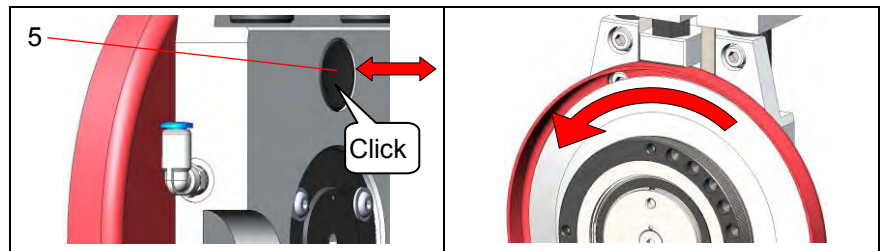


Fig. 26: Latching bolt

2. Press the latching bolt, turn the knife collar until the bolt engages and keep the bolt pressed down. This will stop the blade carrier from turning.

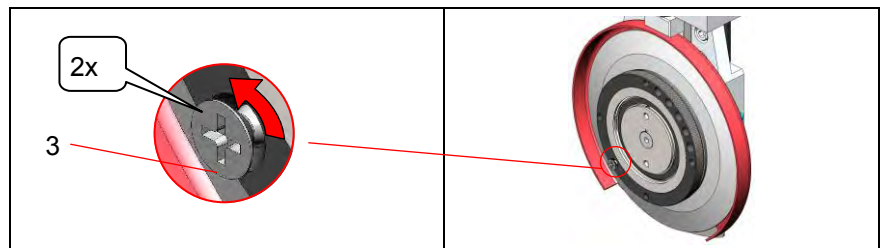


Fig. 27: Safety screw and ring nut

3. Loosen the safety screw.

7 Knife collar

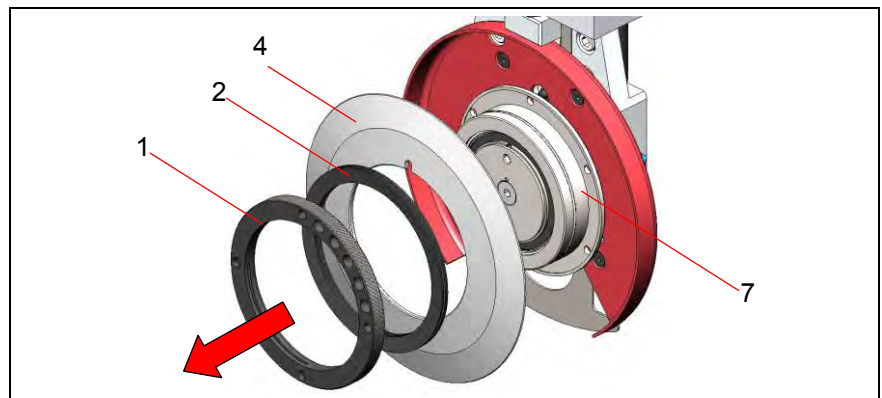


Fig. 28: Knife replacement

4. Remove the ring nut.
5. Remove the dished knife together with the spring pack.
6. Clean all components carefully. Do not use compressed air.

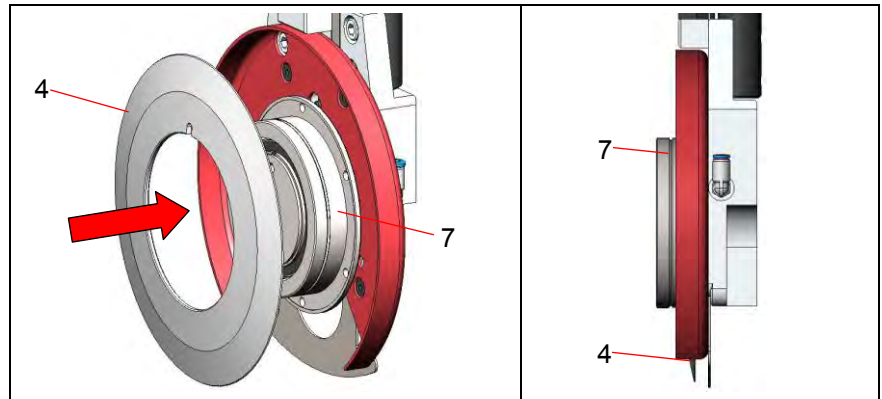


Fig. 29: Knife replacement

7. Fit the new knife to the knife collar as shown in the diagram.

8 Flush

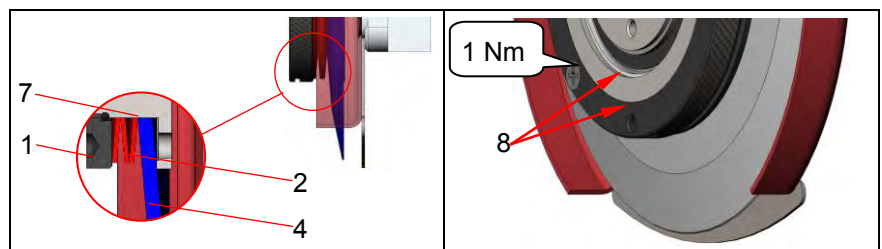


Fig. 30: Knife replacement

8. Place the spring pack onto the knife collar as shown in the diagram.
9. Screw the ring nut onto the knife collar until the screw is flush with the knife collar.
10. Tighten the safety screw. Tightening torque 1 Nm.
11. Check concentricity of knife.
12. Check overlap depth, correct if necessary.
13. Reconnect the compressed air supply. This completes the work and the knife holder is ready for operation again.

i Note

Only original DIENES slitting tools ensure trouble-free operation.



Fig. 31: Dienes Service Line

5.7 Positioning the knife holder / Adjusting the format

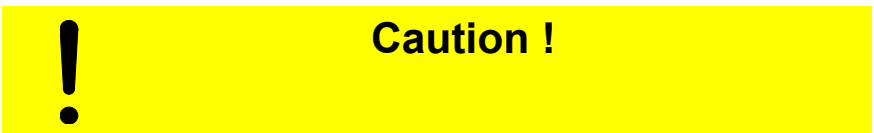
The slitting position is determined by the cutting edge of the bottom knives. The bottom knife of the knife pairs must first be positioned accordingly. The top knife holder is then aligned with the cutting edge of the bottom knife.



Disconnect the compressed air supply before carrying out any adjustments.

There is a risk of being cut in the area of the knife edge.

- Always wear protective gloves when working on the knife holder. (Dienes order no.: 0FHANDS000001)
- Safeguard the machine against restarting and unintended movement.



All clamp levers and screws that have been unscrewed during a change of format must be firmly tightened again afterwards.

- 1 Top knife
- 2 Gauge
- 3 Bottom knife

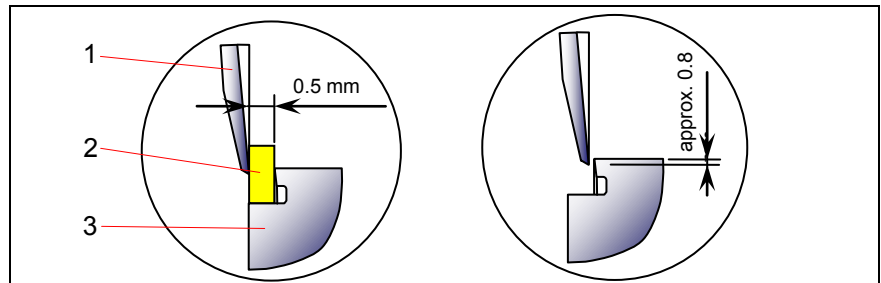


Fig. 32: Parameter settings, standard values top knife to bottom knife

5.7.1 Positioning slide type "ES"



There is a risk of being cut in the area of the knife edge. Setting the adjusting slide requires great care.

- Always wear protective gloves when working on the knife holder. (Dienes order no.: 0FHANDS000001)
- Safeguard the machine against restarting and unintended movement.

The lateral alignment of the top knife with the bottom knife can be considerably simplified and carried out more accurately by fitting the knife holder with the type "ES" positioning slide which is optionally available. Alignment in detail:

The illustrations shown here are intended to illustrate the principle and may differ from the product in question.

- 1 Top knife
- 2 Bottom knife
- 3 Positioning slide

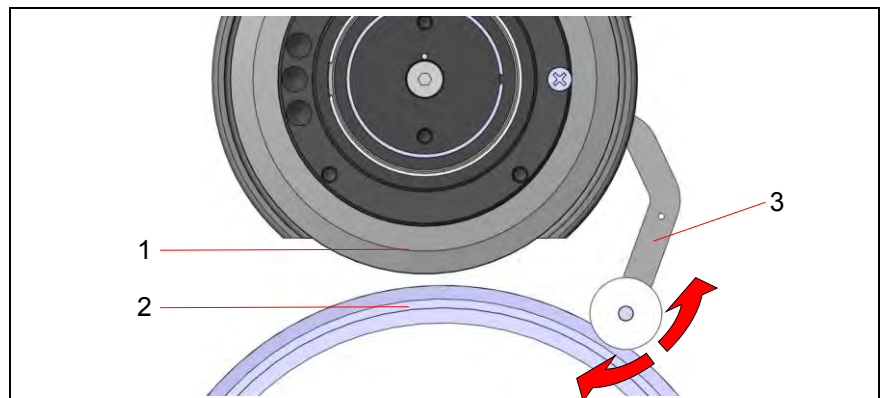


Fig. 33: Positioning slide type "ES" (schematic diagram)

- 4 Stop plate
- 5 Contact surface
- 6 Blade bottom knife
- 7 Distance ex-works (guide value)

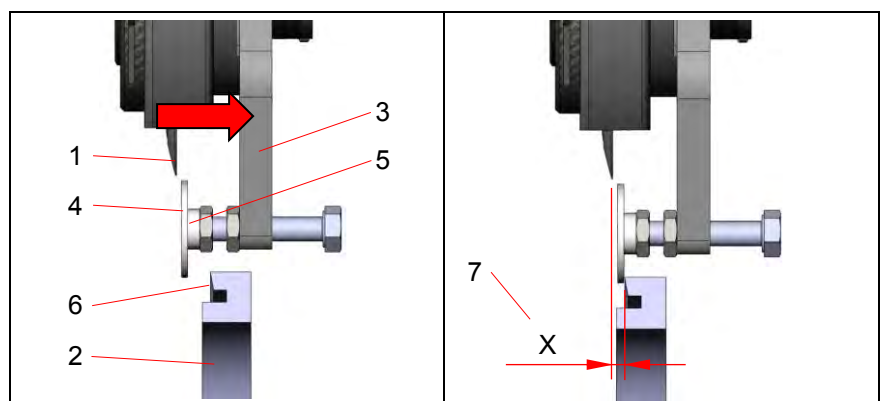


Fig. 34: Positioning slide type "ES" (schematic diagram)

Handling

1. Laterally align the knife holder approximately with the bottom knife

2. Swivel the positioning slide down from its rest position until it overlaps
3. Align the knife holder with the contact surface of the positioning slide on the blade of the bottom knife
4. Fix knife holder on crossbar and swivel positioning slide back until it engages in the rest position.

5.7.2 Adjusting positioning slide type "ES"



There is a risk of being cut in the area of the knife edge.

- Always wear protective gloves when working on the knife holder. (Dienes order no.: 0FHANDS000001)
- Safeguard the machine against restarting and unintended movement.

If corrections are required to the lateral distance between top and bottom knife due to changed cutting requirements or the use of external force, the positioning slide can easily be readjusted on site.

- 1 Dished knife
- 2 Stop plate
- 3 Distance ex-works (guide value)
- 4 Latching pin, adjusting slide
- 5 Adjusting slide arm
- 6 Counter nut
- 7 Adjusting screw
- 8 Contact surface

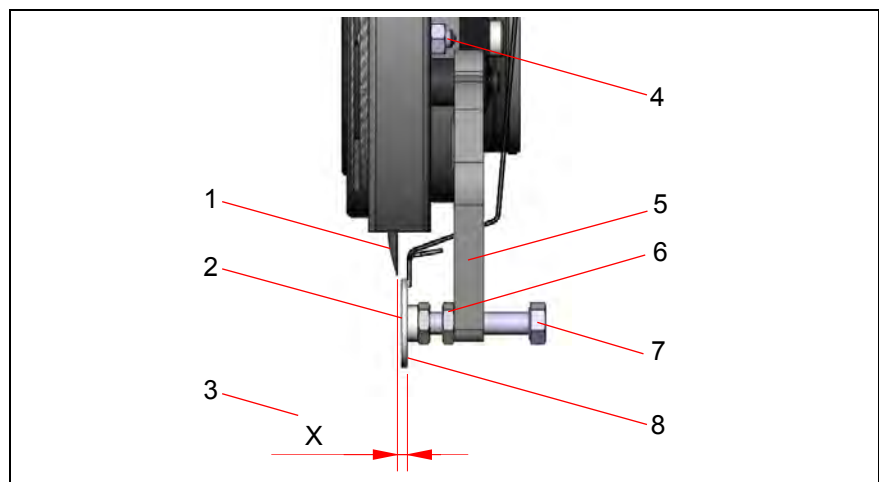


Fig. 35: Setting up the adjusting slide

The illustration shown here is intended to illustrate the principle and may differ from the product in question.

1. Move the knife holder to the standby position
2. Swivel the positioning slide under the dished knife.
3. Undo the lock nut for the positioning slide adjusting screw.
4. Set the required distance between the dished knife and the contact surface of the stop plate by turning the adjusting screw.
5. When adjustment is complete, retighten the lock nut.
6. Check the distance.
7. Move the adjusting slide to the standby position. The work is now completed.

6 Maintenance

6.1 Safety instructions for servicing

It is imperative that the following safety instructions are observed while servicing the machine – this will prevent fatal personal injuries, damage to the machines, other material damage and damage to the environment.



Danger!

Voltage

Faulty electrical connections or unapproved live parts lead to serious injury or even death.

- On principle, only a trained electrician may work on the machine's electrics.
- Replace any damaged cables or plugs immediately.
- Before starting work, the electrical as well as pneumatic power supply is to be disconnected and secured against accidental restart.
- The handling regulations (e.g. earthing, ...) must be followed to the letter for components which are at risk from static electricity.



Warning!

Entanglement hazard

Rotating components can draw in body parts and cause serious injury or even death.

- Keep a sufficient distance away from rotating machine components.
- Safeguard the machine against restarting and unintended movement during assembly and maintenance work.
- Under no circumstances put your hand into the machine while it is in operation!



Caution!

Cutting hazard



There is a risk of being cut in the area of the knife edge.

- Always wear protective gloves when working on the knife holder. (Dienes Order no.: 0FHANDS000001)
- Safeguard the machine against restarting and unintended movement during maintenance work.



Caution!

Only authorised personnel may carry out cleaning, lubrication and servicing tasks – the operating instructions must be followed to the letter.

Self-locking screws and nuts are always to be renewed.

All quoted screw torques are to be observed to the letter.

In the case of swivelling systems, it must be ensured that these are operated without vibration and are gently swivelled into the end positions.

The sequence of the prescribed work steps must be observed exactly.



Note

The accident prevention regulations must be observed.

All consumables, lubricants and ancillary materials are to be disposed of in an environmentally friendly manner.

Repairs may only be undertaken by authorised service engineers.

6.2 Service and cleaning work

The shear cut knife holders are essentially maintenance-free.

However, it must be ensured that the sliding elements are cleaned at regular intervals. Also the clamping bolts, the centring pin and the installation surface must be kept clean at all times and greased lightly.



Caution!

Dust deposits must be vacuumed off. In order to prevent particles penetrating the guides, compressed air should never be for cleaning purposes.

Cleaning must be carried out at least every three months.

If dust deposits are extremely heavy, the machine must be cleaned at more frequent intervals.

Apply a light coating of oil to parts of the machine that are at risk of corrosion (blued or bare) at monthly intervals. Shorter intervals may be required depending on the humidity.

This does not include the clamping strips, which must not be lubricated because this would adversely affect the clamping effect.

Spray oil must be used that is compatible with the grease that is used at the other lubricating points.

For safety and quality reasons, the maintenance and assembly work on the knife head must be carried out in the manufacturer's factory.



Note

More complicated maintenance and repair work must be carried out in the manufacturer's factory.

If equipment is dismantled on site, Molykote paste BR2 must be used as the lubricant for sliding surfaces, and a lithium soap-based ball bearing grease with consistency class NGLI1 must be used for ball bearings.

Please note that any dust deposits that build up must be removed using a vacuum cleaner only.

Cleaning with compressed air can lead to damage caused by fine dust particles, which can penetrate moving components (linear guides, linear drives etc.).

6.3 Lubrication

6.3.1 Knife holder lubrication

The bearing points on the knife holder have lifetime lubrication, meaning that re-greasing is not required.

6.4 Service Line

Dienes Service Line
Repeat orders and regrinding service at
Tel.: 02206 – 605160
www.dienes.de



Fig. 36: Dienes Service Line

i Note

Only original DIENES cutting tools ensure trouble-free operation.

7 Servicing

7.1 Safety instructions for maintenance

It is imperative that the following safety instructions are observed when maintaining the machine - this will prevent fatal personal injuries, damage to the machine, other material damage and damage to the environment.



Danger!
Voltage

Faulty electrical connections or unapproved live parts lead to serious injury or even death.

- In principle, only a trained electrician may work on the machine's electrics.
- Replace any damaged cables or plugs immediately.
- Before starting work, the electrical as well as pneumatic power supply is to be disconnected and secured against accidental restart.
- The handling regulations (e.g. earthing, etc.) must be followed to the letter for components which are at risk from static electricity.



Warning!
Entanglement hazard

Rotating parts can pull in parts of the body and cause severe injuries or even death.

- Keep a sufficient distance away from rotating machine components.
- Safeguard the machine against restarting and unintended movement during assembly and maintenance work.
- Under no circumstances put your hand into the machine while it is in operation!



Caution!
Cutting hazard!



There is a risk of being cut in the area of the knife edge.

- Always wear protective gloves when working on the knife holder. (Dienes Order no.: 0FHANDS000001)
- Safeguard the machine against restarting and unintended movement during maintenance work.



Caution!

Only authorised personnel may carry out cleaning, lubrication and servicing tasks – the operating instructions must be followed to the letter.

Self-locking screws and nuts are always to be renewed.

All quoted screw torques are to be obeyed to the letter.

In the case of swivelling systems, it must be ensured that these are operated without vibration and are gently swivelled into the end positions.

The sequence of the prescribed work steps must be observed exactly.



Note

The accident prevention regulations must be observed.

All consumables, lubricants and ancillary materials are to be disposed of in an environmentally friendly manner.

Repairs may only be undertaken by authorised service engineers.

7.2 Remedial measures in the case of failures

7.2.1 Knife holder

Malfunction	Cause	Remedy
<ul style="list-style-type: none"> Dished knife/ top knife does not move into working position 	<ul style="list-style-type: none"> Knife holder distorted during fitting No compressed air supply or insufficient operating pressure Soiling of the knife holder or gliding planes of the guides 	<ul style="list-style-type: none"> Reposition the tool holder on the holder bar or adapter and align at a right angle Check the pressure supply Clean and lubricate the knife holder
<ul style="list-style-type: none"> Cut edge not exact 	<ul style="list-style-type: none"> Dished knife / top knife or bottom knife damaged Shear angle not correctly aligned to the web Overlap depth set incorrectly Lateral contact pressure of the dished knife / top knife too high or too low 	<ul style="list-style-type: none"> Replace cutting tools Use the angle plate to align the shear angle correctly Correct depth adjustment Correct contact pressure via pressure adjustment / adjusting screw
<ul style="list-style-type: none"> Compressed air escaping from the knife holder 	<ul style="list-style-type: none"> Operating pressure too high or gasket damaged 	<ul style="list-style-type: none"> Correct operating pressure or replace sealing elements
<ul style="list-style-type: none"> Knife service life too short 	<ul style="list-style-type: none"> Cutting pressure too high Shear angle incorrect Knife overlap between top and bottom knife insufficient, top knife edge jumps onto the outer diameter of the bottom knife Knives reground incorrectly Lateral or height runout of the bottom knife too big 	<ul style="list-style-type: none"> Correct operating pressure Check positioning of the shear angle plate (observe web direction) Check knife overlap and readjust if necessary Replace knives Align bottom knife and replace if necessary

8 Taking out of service (scrapping)

8.1 Safety instructions

It is imperative that the following safety instructions are observed during disassembly of the machine – this will prevent fatal personal injuries, damage to the machines, other material damage and damage to the environment.



Danger!
Voltage

The electric and pneumatic power supplies must be disconnected before work is started.

Improper handling of the live parts can lead to serious injury and even death.



Caution!
Cutting hazard



There is a risk of being cut in the area of the knife edge.

- Always wear protective gloves when working on the knife holder. (Dienes Order no.: 0FHANDS000001)



Note

Dismantling must always be carried out by technically qualified personnel.

Final taking out of service and disposal requires complete de-installation of the power supply.

Machines that are being scrapped should be disposed of in accordance with legal requirements and any local requirements that exist.

9 Accessories available from the DIENES company



Fig. 37: Dienes accessories

1	Protective gloves	Order No.:	0FHANDS000001
2	Exchange tools fopr PSGm19, used for replacing the knife holder on the shear cut knife holder PSGm19	Order No.:	290A046002001
3	Hexagon screwdriver Size 3	Order No.:	0FWERKZ000005
4	Cross slot screwdriver Size 2K	Order No.:	0FWERKZ000008
5	Torx screwdriver Size = TX 20 x 100	Order No.:	4959051683
6	Hook spanner		
	Ø 48 – 53 mm	Order No.:	290B000028030
	Ø 54 – 60 mm	Order No.:	290B000028040
	Ø 68 – 75 mm	Order No.:	290B000028050
	Ø 80 – 90 mm	Order No.:	290B000028060
	Ø 101 – 109 mm	Order No.:	290B000029030

Ø 110 – 120 mm	Order No.:	290B000028070
Ø 130 – 140 mm	Order No.:	290B000028080
Ø 150 – 160 mm	Order No.:	290B000029050
Ø 205 – 220 mm	Order No.:	290B000029100
Ø 224 – 239 mm	Order No.:	290B000029080
7 Adjustment device used to adjust the knife overlap outside of the cutting station.	Information on request from DIENES	
8 Assembly tools for easier knife replacement on the knife holders	Information on request from DIENES	
9 Hexagon spanner set Sizes = 1.5 - 2 – 2.5 - 3 - 4 - 5 - 6 - 8 - 10	Order No.:	4959050345
10 Feeler gauge set Set sizes = from 0.05 – 0.3 mm with 0.05 increments, from 0.3 - 1mm with 0.1mm increments	Order No.:	0FWERKZ000016
11 Grease press with grease cartridge	Order No.:	0FFETTP000001

i Note

In addition Dienes knife cabinets, for safe storage of the knives, and Dienes knife boxes, for safe transportation of the knives, are also available on request, of course.

10 Regrinding service



Dienes Group 48-hour knife regrinding service provided by the manufacturer!

Even the best knives have to be replaced at some time.

Dienes has also made this procedure quicker and safer with sophisticated replacement systems that ensure optimum protection against injury.

The 48-regrinding service for the latest generation of CNC machines is carried out with the same strict quality criteria that you would rightly expect from knives from the Dienes group.

In addition to seminars and in-house training, the regrinding service is an important module in the Dienes Service offer.

The regrinding service includes:

- Hotline (optional)
- Collection
- Cleaning
- Precision measurement
- Group allocation
- 2-phase CNC/NC precision grinding
- "ASO" anti dust surface (optional)
- Testing
- Protocol, test report (optional)
- Shipment

Your partner at the cutting edge of competition worldwide.

For round knives:

Dienes Werke

Kölner Str. 7
D-51491 Overath
Tel. +49 2206 / 60 5 0
Fax +49 2206 / 60 5 111

For straight knives:

JOHANN KRUMM GmbH & Co.KG

Kölner Str. 7
D-51491 Overath
Tel. +49 2206 / 60 5 0
Fax +49 2206 / 60 5 111

For rotary shear knives:

Messerfabrik Neuenkamp GmbH

Neuenkamper Straße 27
D-42855 Remscheid
Tel. +49 2191 / 93 51-0
Fax +49 2191 / 34 09 06

Service Partners:

We would be glad to provide information about other service partners on request.

www.dienes.de

www.messerservice.de