KNOWLEDGE DATABASE

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MEANING OF MACHINE MODEL CODE

RACER 8S

Racer designated name:
Machine model: tubular machine
Number of embroidery heads
Head spacing (S=400 mm; W=495 mm)
Embroidery field depth (=500 mm; L=700 mm)

RACER 0124-1000 (700) SKW

Racer technical term:
Machine model: tubular machine
Number of embroidery heads
Number of needles/colours
Embroidery field width
Embroidery field depth
Additive: **SKW = Automatic bobbin changer**
JSKW = Jumbo automatic bobbin changer
SF = Fast colour change

Challenger YGF 1418-480D

Fladbed technical term:

- Machine model: Challenger
- Size of machine base: YGF
- Type of embroidery heads: 1
- Number of embroidery heads: 4
- Number of needles/colours: 18
- Head spacing; embroidery field width per head: 480
- Additive: (D = double embroidery field width due to head switching): D

SGFA 0112-1300

Fladbed technical term:

- Size of machine base: SGF
- Type of embroidery heads: A
- Additive: 0
- Number of embroidery heads: 1
- Number of needles/colours: 12
- Head spacing; embroidery field width per head: 1300

Caution:
Challenger YGF ... ≠ CYGF ...
The term „Challenger“ refers to the machine type called Challenger. Prefix „C“ signifies a standard flatbed machine that is equipped with the Challenger drive technology.

SGFA 1206-48/4 D (700)

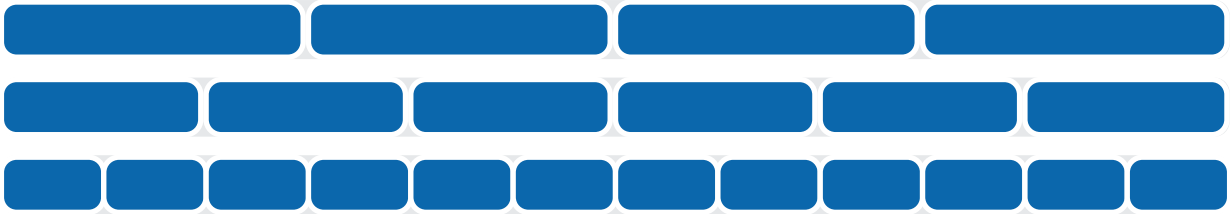
Embroidery field width:
Specification in x/4 are measurements in inch.
48/4 = 48/4“ = 12“ = 324,84 mm

repeat mm	974,52	649,68	324,84	243,63	216,56	162,42	108,28	81,21	54,14
repeat x/4	144/4	96/4	48/4	36/4	32/4	24/4	16/4	12/4	8/4

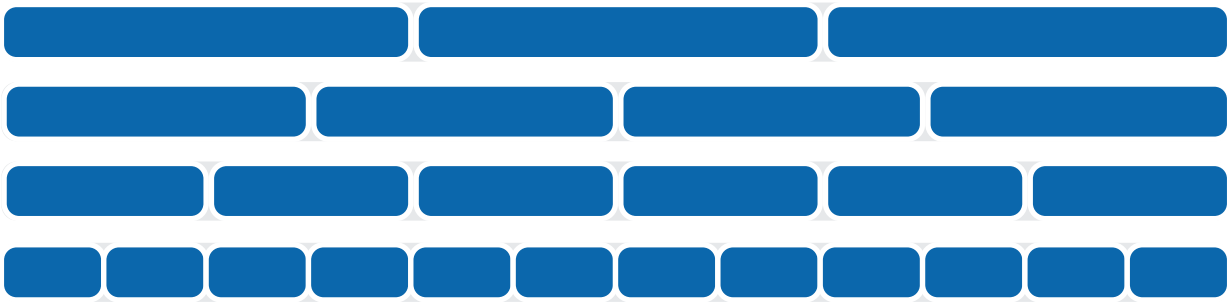
Additive Headselection:
_= Single: SGFA 1206-48/4 (700): Standard
12 Heads operation, Embroidery field: 324,84x700 mm

D = Double: SGFA 1206-48/4 D (700):
6 Heads operation, Embroidery field: 649,68x700 mm
or 12 Heads operation, Embroidery field: 324,84x700 mm

T = Triple: SGFA 1206-48/4 T (700):
4 Heads operation, Embroidery field: 974,52x700 mm
or 6 Heads operation, Embroidery field: 649,68x700 mm
or 12 Heads operation, Embroidery field: 324,84x700 mm



Q = Quadruble: SGFA 1206-48/4 Q (700):
3 Heads operation, Embroidery field: 1299,36x700 mm
or 4 Heads operation, Embroidery field: 974,52x700 mm
or 6 Heads operation, Embroidery field: 649,68x700 mm
or 12 Heads operation, Embroidery field: 324,84x700 mm



With an additive Q, the D-operation is always possible. The T-operation with additional Q is only possible when the number of heads is divisible by both three and four.

Repeating Distance:
In most cases, the head spacing is equal to the maximum embroidery field width per head. The embroidery fields of each head are repeated in alignment. Therefore, the repeating distance is a multiple of the head spacing.
For example: 3 motifs per head, head spacing 480 mm: Repeating distance; 160 mm.

MACHINE MEASUREMENTS FLATBED

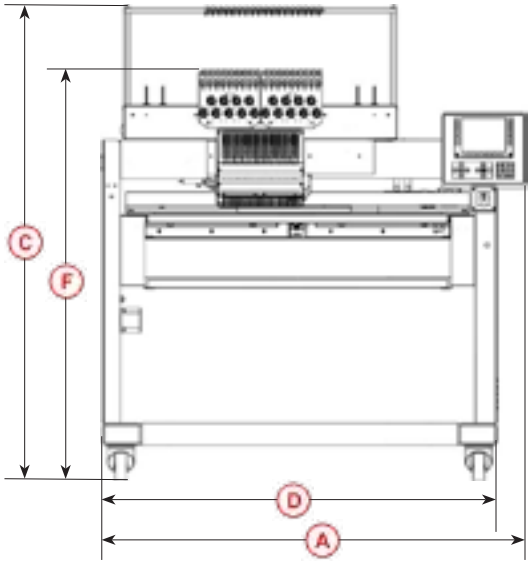
Machine length according to size of the machine base:

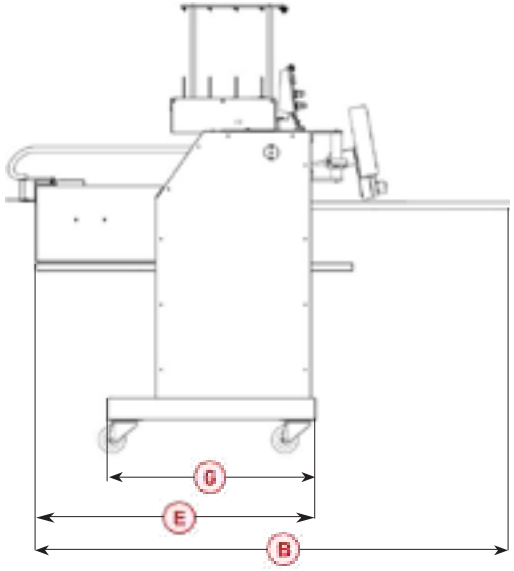
SC	3.765	mm
SG	4.045	mm
MC	5.635	mm
MG	5.725	mm
LB	6.238	mm
LC	6.385	mm
LG	6.825	mm
XC	7.595	mm
XG	7.925	mm
XH	8.170	mm
YC	8.785	mm
YG	9.220	mm
YH	9.785	mm
ZB	11.215	mm
ZC	11.550	mm

SGFA 0112-1300

CXCF II 1212-480

MACHINE MEASUREMENTS RACER





alle Maße in mm all dimensions in mm		Abmessungen max. Dimensions max.			Abmessungen min. Dimensions min.			
TYP TYPE	STICKFELD-TIEFE EMBROIDERY FIELD DEPTH	LÄNGE LENGTH	BREITE (TIEFE) WIDTH (DEPTH)	HÖHE HEIGHT	LÄNGE LENGTH	BREITE (TIEFE) WIDTH (DEPTH)	HÖHE HEIGHT	GESTELLTIEFE FRAME DEPTH
		(A)	(B)	(C)	(D)	(E)	(F)	(G)
Racer 1 W	500	1550	1330	1750	1430	830	1490	800
Racer R1 W	500	1550	1360	1640	1455	850	1500	668
Racer 1 WL II	700	1550	1825	1720	1430	1080	1500	800
Racer 1 WL	700	1550	1825	1750	1430	1080	1490	800
Racer 1 XL	700	1960	1825	1790	1850	1080	1490	800
Racer 0124-1000	700	2580	1840	1790	2470	1080	1490	800
Racer H0118-495	500	1960	1330	1640	1850	960	1500	800
Racer Z0118-495	500	1960	1330	1640	1850	830	1500	800
Racer 2 W	500	1960	1330	1750	1840	830	1490	800
Racer 2 W II	500	1960	1330	1720	1840	830	1500	800
Racer 2 WL	700	1960	1825	1750	1840	1080	1490	800
Racer 2 XL SKW	700	2580	1840	1760	2470	1840	1490	800
Racer 0218-550D SKW	700	3380	1840	1760	3270	1840	1490	800
Racer 0224-700D SKW	700	3380	1840	1760	3270	1840	1490	800
Racer R0218-700D SKW	700	3550	1815	1800	3270	1815	1500	668

Racer K0200-495	500	1960	1330	1360	1840	960	1360	800
Racer H0309-550	700	3380	1840	1650	3270	1230	1490	800
Racer 4 S Classic	500	2580	1330	1720	2470	830	1490	800
Racer 4 S	500	2580	1330	1720	2470	830	1490	800
Racer 4 W	500	3380	1330	1720	3270	830	1490	800
Racer 4 W II	500	3380	1330	1720	3270	830	1500	800
Racer R4 W	500	3380	1360	1640	3270	850	1500	668
Racer 4 WL	700	3380	1840	1720	3270	1080	1490	800
Racer 4 WL II	700	3380	1840	1720	3270	1080	1500	800
Racer 6 S Classic	500	3380	1330	1720	3270	830	1490	800
Racer 6 S	500	3380	1330	1720	3270	830	1490	800
Racer 6 SL	700	3380	1840	1720	3270	1080	1490	800
Racer 6 W	500	4360	1640	1680	4250	1170	1490	890
Racer 6 W II	500	4360	1640	1720	4250	1170	1500	890
Racer 8 S Classic	500	4360	1640	1680	4250	1170	1430	890
Racer 8 S	500	4360	1640	1680	4250	1170	1430	890
Racer 8 WL II	700	6015	2050	1760	5900	1350	1450	890
Racer 12 S	500	6015	1150	1760	5900	1150	1450	890

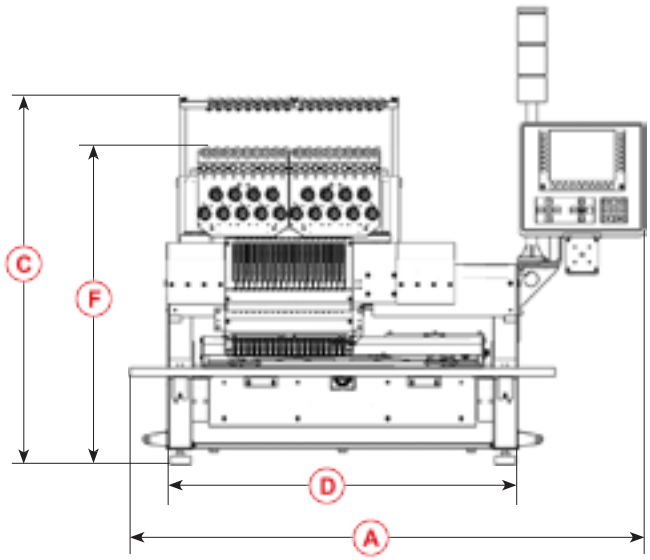
HINWEIS

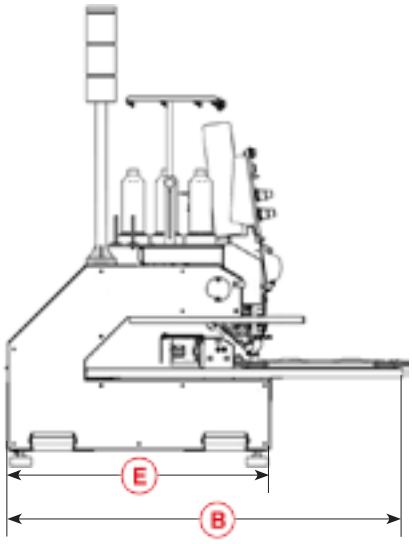
Maschinen vom Typ Racer WL können **im Notfall** noch zusätzlich zur Standarddemontage weiter demontiert werden, um die Maschine durch nicht standardmäßige Türöffnungen zu transportieren. Die Maschine kann dadurch **im Idealfall** drehend durch die Türöffnung (min. 715 mm) transportiert werden.
Zur Demontage müssen die hinteren Schutzhauben, die hintere Tischplatte und der mittlere Pantographenantrieb (Tiefe) inkl. der zugehörigen Wellen demontiert werden.
Vor Demontage des mittleren Pantographenantriebes (Tiefe) muss dieser mit Zylinderstiften mit dem Gestell verstiftet werden, um die Original-Einbauposition bei der späteren Montage wieder zu erreichen.

NOTICE

Racer WL machines can be further disassembled in addition to standard disassembly **in case of emergency** in order to transport the machine through non-standard door openings.
In the best case, this allows the machine to be transported through the door opening (min. 715 mm) in a rotating manner.
For disassembly, the rear protective hoods, the rear table plate and the center pantograph drive (depth) incl. the associated shafts must be dismantled.
Before disassembling the center pantograph drive depth, it must be pinned to the machine frame with dowel pins in order to regain the original installation position for subsequent assembly.

MACHINE MEASUREMENTS SPRINT

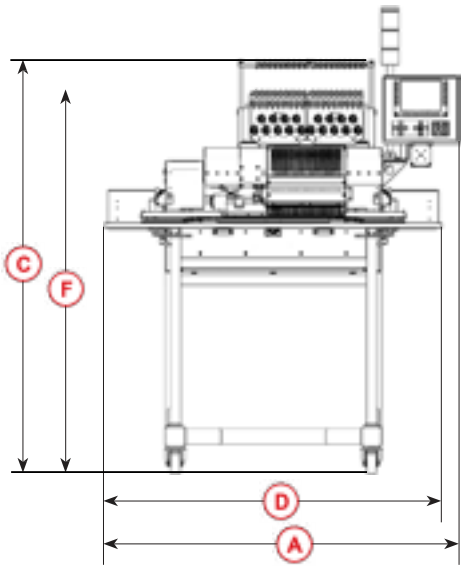


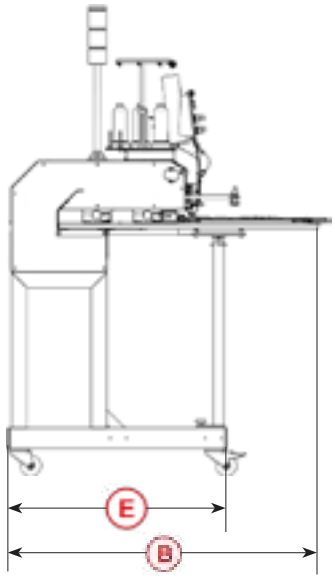


alle Maße in mm all dimensions in mm		Abmessungen maximal Dimensions maximum			Abmessungen minimal Dimensions minimum		
TYP TYPE	STICKFELD EMBROIDERY FIELD	LÄNGE LENGTH	BREITE (TIEFE) WIDTH (DEPTH)	HÖHE HEIGHT	LÄNGE LENGTH	BREITE (TIEFE) WIDTH (DEPTH)	HÖHE HEIGHT
		(A)	(B)	(C)	(D)	(E)	(F)
Sprint Classic	310	1160	943	875	860	627	750
Sprint 6	310	1160	943	875	860	627	750
Sprint 7	310	1260	940	875	860	627	750
Sprint 7 MAX	310	1340	940	875	860	627	750
Sprint 8	310	1250	960	980	895	650	785

Gewichtsangaben **Weight specification**	**Kg**
Sprint Classic/Sprint 6 Maschine mit Tischplatte Machine with table top	86
Sprint 7 Maschine mit Tischplatte Machine with table top	100
Sprint 8 Maschine mit Tischplatte Machine with table top	130
Sprint Classic / 6 / 7 Untergestell Undercarriage	37
Sprint 8 Untergestell Undercarriage	60

MACHINE MEASUREMENTS SPRINT L

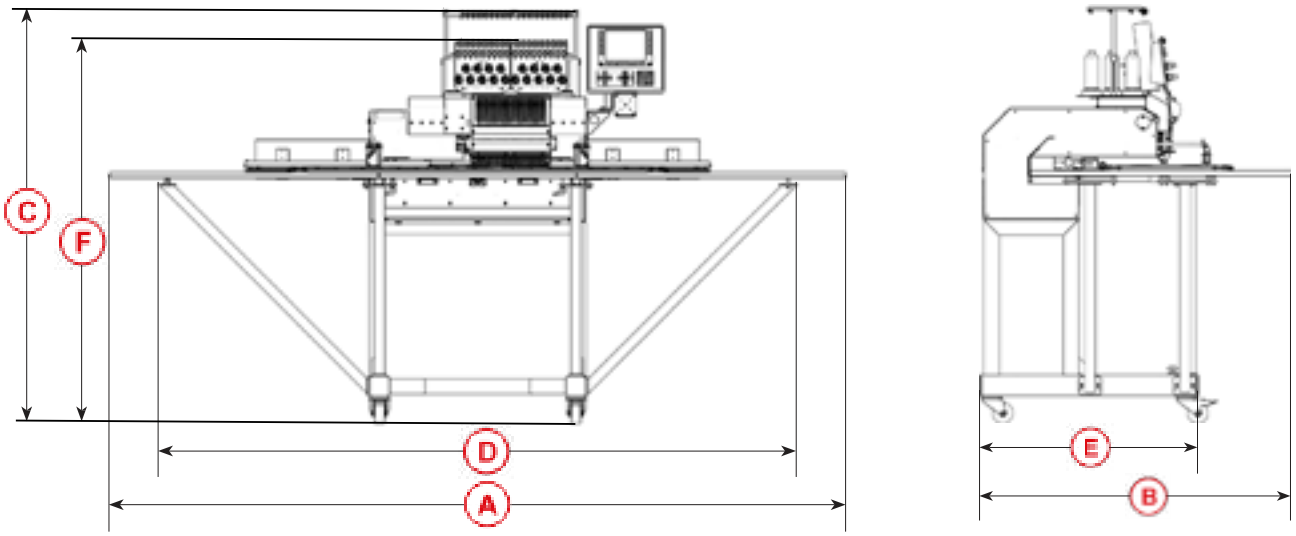




alle Maße in mm all dimensions in mm		Abmessungen maximal Dimensions maximum			Abmessungen minimal Dimensions minimum		
TYP TYPE	STICKFELD EMBROIDERY FIELD	LÄNGE LENGTH	BREITE (TIEFE) WIDTH (DEPTH)	HÖHE HEIGHT	LÄNGE LENGTH	BREITE (TIEFE) WIDTH (DEPTH)	HÖHE HEIGHT
		(A)	(B)	(C)	(D)	(E)	(F)
SPRINT 6 L	280	1340	985	1595	1340	627	1540
SPRINT 7 L	400	1410	1215	1650	1340	860	1540

Die vorderen Streben unterhalb der Tischplatte sind für Freiarmbetrieb demontierbar.

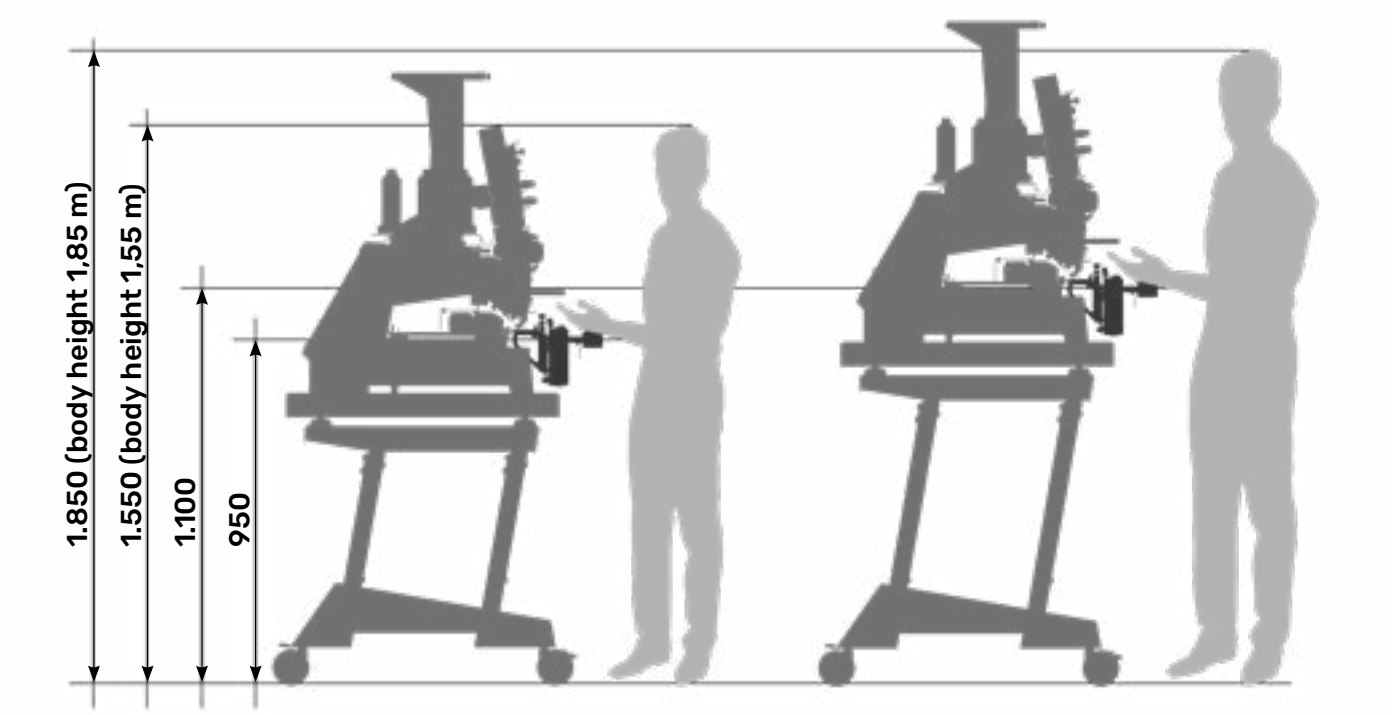
MACHINE MEASUREMENTS SPRINT XL



alle Maße in mm all dimensions in mm		Abmessungen maximal Dimensions maximum			Abmessungen minimal Dimensions minimum		
TYP TYPE	STICKFELD EMBROIDERY FIELD	LÄNGE LENGTH	BREITE (TIEFE) WIDTH (DEPTH)	HÖHE HEIGHT	LÄNGE LENGTH	BREITE (TIEFE) WIDTH (DEPTH)	HÖHE HEIGHT
		(A)	(B)	(C)	(D)	(E)	(F)
SPRINT 6 XL	400	2580	985	1595	1850	627	1540
SPRINT 7 XL	400	2925	1215	1650	2536	860	1540

Die mittleren Streben unterhalb der Tischplatte sind für Freiarmbetrieb demontierbar.
Die Seitenstreben können nicht demontiert werden!

ERGONOMIC WORKING HEIGHT SPRINT



Body height [m]	working height tubular* [mm]
1,55 - 1,65	950
1,65 - 1,75	1.000
1,75 - 1,85	1.050
1,85 +	1.100

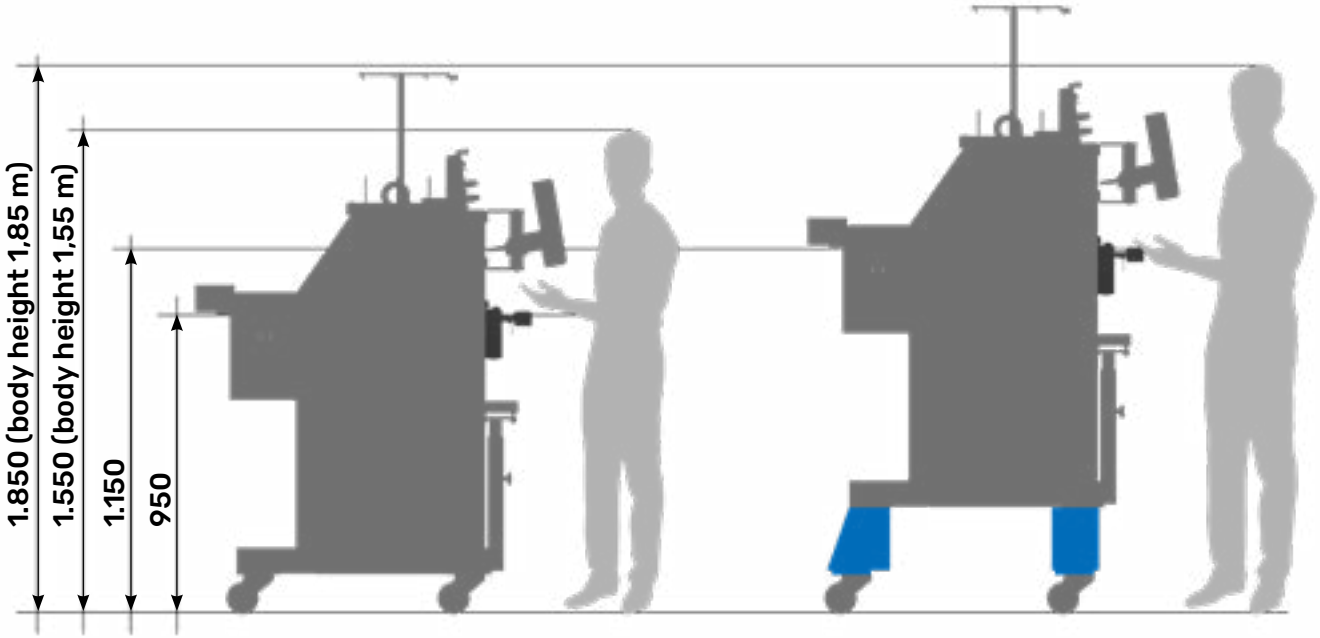
*For border frame operations we recommend the lowest working height.

We care about the health of our clients employees. A healthy posture is especially important in a full-time job. For this reason, the working height of all our Sprint models can be adjusted to the operator and offer great workplace ergonomics by default.

The base is adjustable to four heights. We recommend the adjustments in the table above.

The height of the base has to be adjusted before placing the machine on top of it.

ERGONOMIC WORKING HEIGHT RACER



Body height [m]	working height tubular* [mm]
1,55 - 1,75	950
1,75 - 1,85	1.050
1,85 +	1.150

*For border frame operations we recommend the lowest working height.

We care about the health of your employees. A healthy posture is especially important in a full-time job. For this reason, we offer two heights of machine raisers for all our Racer machines but Racer 8 WL and Racer 12S:

+ 100 mm **Art.No.: 368.999.905**
+ 200 mm **Art.No.: 368.999.904**

The base is adjustable to four heights. We recommend the adjustments in the table above.

A subsequent installation is only possible with sufficiently dimensioned lifting equipment. Therefore we recommend to order the machine elevation directly with the machine.

AUTOMATED PATCH PRODUCTION

We have developed a solution that automates the production of patches on Hook&Loop tape, by continuously emphasizing on enhancing the efficiency of our customers' manufacturing processes. This process increases **efficiency, precision, flexibility**.

STEP1 - Decorative embroidery
Mechanism keeps hook tape underneath the tubular arm. The adhesion of the hooks is preserved.

STEP2 - Applying Hook Tape
Mechanism lifts hook tape above the tubular arm, so that it is sewn with the embroidered tape.

STEP3 - Cutting patches
The system can also be paired with laser cutting solutions from leading suppliers like Willy or SEIT from Italy.

Possible tape width: 25-50 mm
With minor changes: 15-25 mm possible

Conventional Patch Production

STEP1: Emblem or logo is embroidered on backing web.
STEP2: Patches are cut out individually by hand (outsourced).
STEP3: Marking for positioning is embroidered on hook or self-adhesive tape.
STEP4: Emblems are individually hand aligned to markings and adhered.
STEP5: A separate embroidery file joins hook tape and emblem with a seam.
STEP6: Patches are cut out again by hand.

HEAD SELECTION - MULTIHEAD MACHINES

Individual heads can be switched on or off during embroidery via the head selection. This switch-off can be stored in the embroidery design and takes place automatically, without machine stop and without manual intervention by the operator.

This function increases **efficiency, and flexibility**.

Use case - Name Patches (Quicktext)
Optimized workflow for the realization of team names. Minimize production time by using individual head selection on your multihead machines. Just load a list of names in BasePac Quicktext with the corresponding logo. This logo is embroidered on all heads at the same time, after that the heads work through all names individually.

Conventional Production

STEP1: Emblem or logo is embroidered on the garment. All heads switched on.
STEP2: Machine stop in the embroidery data. Operator needs to manually switch of all heads but head number 1.
STEP3: The first name is embroidered on head number 1.
STEP4: Machine stop in the embroidery data. Operator needs to manually switch of all heads but head number 2. [...]

STENCIL SOLUTION

- A template (stencil) can be created where dimensions and settings (font, size, style) are set.
- A stencil can contain logos and text.
- A text file (.csv) with names and quantities can be loaded into the system and the machine files are created automatically.
- The files can be pushed into the embroidery machine.
- The quantity will be tracked.

ADVANTAGES OF .Z00 FILES

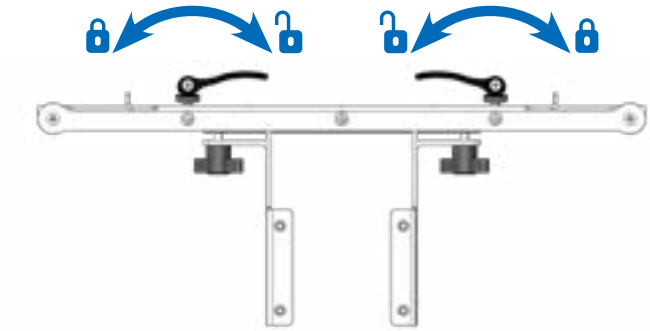
- Loading a .dst file takes about 20 sec. longer than a .z00 file. (10 designs / day > Saving of 14 hours / year / machine.)
- .dst files can be converted to .z00 to save design information for later projects saving a lot of setup time.

Storable in file:
- Needle/Thread Information i.e. automatic colour assignment
- Stitch Information i.e. min./max. stitch length
- Data Information i.e. name, date, coloured preview

Benefits for fashion industry or technical embroidery
- Commands for accessories (i.e. twin sequin device) can be stored in the file.
- Settings for the W-head and K-head can be saved and stored in each design and even be adjusted within a design.

QUICK CHANGE SYSTEM

The Quick Change System enables really fast and easy changing between different devices and frames.



This allows the general workflow to be accelerated, setup times to be shortened, and working time to be effectively better utilized.

SNAP-IN SYSTEM

The Snap-In System has positively shaped pins. These snap into the tubular frame and ensure that they do not slip during embroidery. Plate springs provide contact pressure to reduce vibration.

FAST THREAD PRESSER FOOT

ZSK machines are equipped with Fast Thread Presser Feet as standard. These are open to the rear. This means that additional threading of the yarn through the presser foot is not necessary.
Needle and presser foot would be the most frequently affected points that need to be rethreaded after a thread breakage.

INTELLIGENT PRESSER FOOT (IPF)

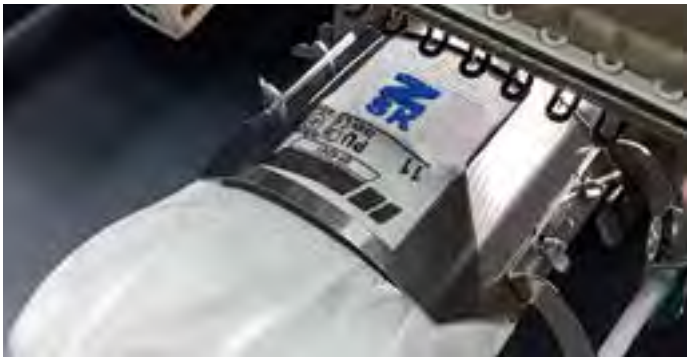
- The R-Series machines feature an actively driven presser foot.
- The presser foot is lowered prior to needle insertion and stays on the embroidery base until the needle exits the garment.
- The Intelligent Presser Foot minimizes fabric fluttering, enhancing embroidery quality.
- If the presser foot encounters a frame obstruction during descent, the machine stops and displays an error message.
- Adjust the presser foot height only via the T8 control. Mechanical adjustments may cause the presser foot to contact the needle plate, risking damage to the embroidery head.
- This halting mechanism prevents needle and „ratchet breakage," and avoids triggering the **„Snapped Back Overload Protection (SBOP)**," which would necessitate re-engagement.

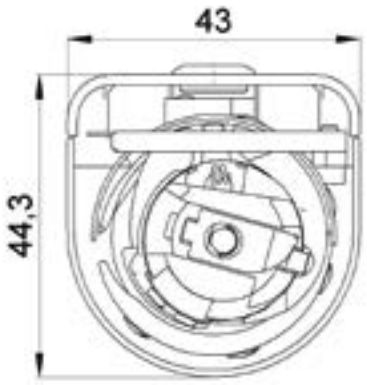
Intelligent Presser Foot

Conventional Presser Foot

SLIM TUBULAR ARM

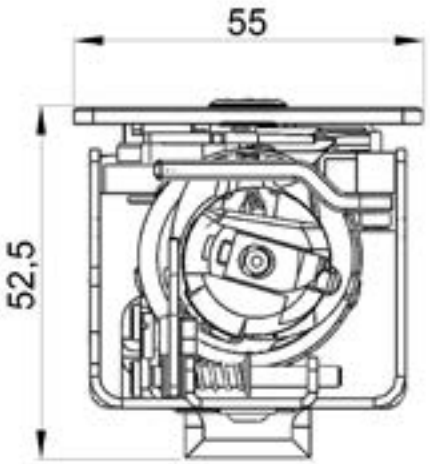
The slimmest tubular arm in the industry enables embroidery even on gloves or shirt pockets, making it particularly flexible in use. Additionally the dead zone by embroidering caps is 7 mm less in height.

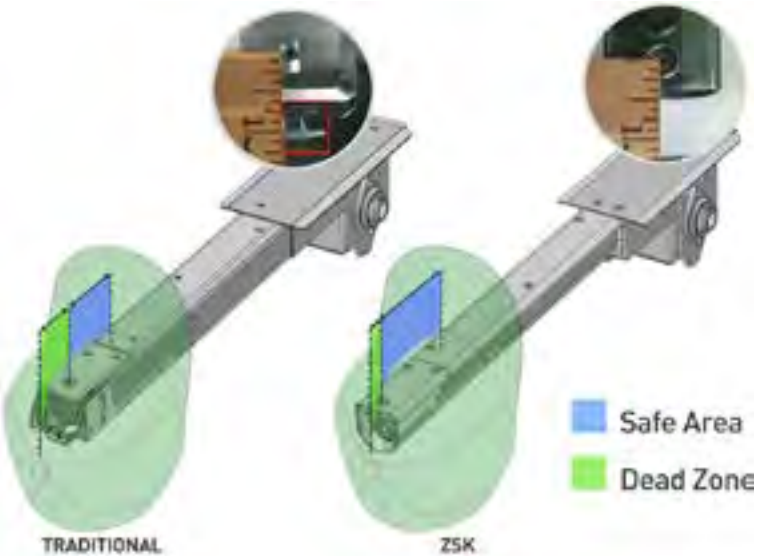




VIGOROUS TUBULAR ARM

We recommend using the vigorous tubular arm for firm and thick materials like leather. Machines with bobbin changer are always equipped with this tubular arm.



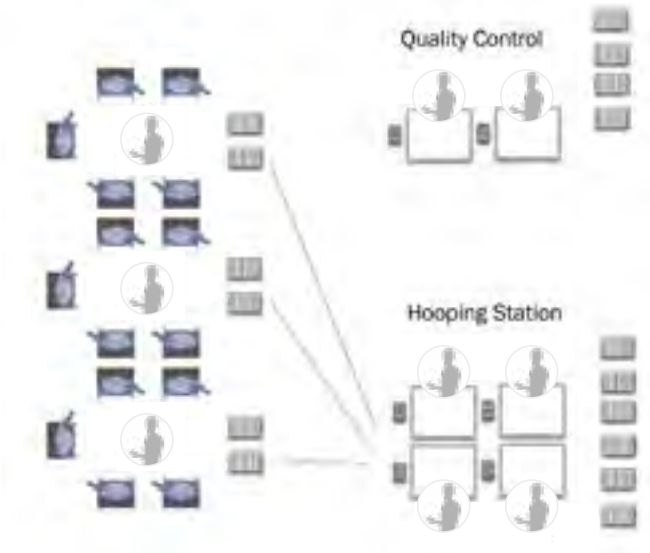


WORKPLACE LAYOUT

The operator is only in charge of operating the machines. Hooping is handled at a different station. Machines are either setup for tubular (polo, shirts…) or cap embroidery. There is no change during the day.
Ready hooped items are being brought into the machine groups together with production information.

Single head machines
We recommend setting up groups of 5 (possibly 6) single head machines per 1 operator.

Multihead machines
For multihead embroidery we recommend to create U shaped groups with 3 machines per operator.



Production Layout
The operator can focus on only one task. Hooping, Machine Operation or Quality Control.
When a new employee starts it is easier and quicker to fully utilize his time.
Operators only remain in their area of responsibility and ensure highest output and highest quality

THREAD LAYOUT

A higher number of needles reduces the overall need to change thread and increases efficiency. Therefore ZSK offers machines with up to 24 needles / colours per head.

Thread storage
To reduce the non-productive walking time of the operator, there should thread boards close to the machine.

Most customers only use about 35 thread colours. These can easily be represented on such a board.
The thread is right at the machine and can be changed very quickly.

Orders with standard colours can be offered at lower rates.

Thread layout on the machine
We recommend equipping the frontmost cones with the most common colours. These include black, white, blue, red, yellow and green. Due to the frequency of use, they must be changed most often and must be in the most accessible position.

NETWORK CAPABILITY

Why network your embroidery machine?
- Fast loading of designs and reduction of downtime between jobs
- Increase of productivity and efficiency
- Access to all of your designs from every machines
- Machine speed and colours can be set automatically in the design
- Eliminate risk of loading wrong designs via USBs
- Easy Backup to prevent loss of production in case of system failure

Loading design:

Push: The design is automatically pushed into the machine i.e. when the previous design has been completed. This is a useful feature for emblem and lettering applications. The system is controlled by a design queue.

Pull: The operator performs an action i.e. scan of a **barcode** to load a design into the machine.

PoolBox
- 50 machines per PoolBox can be integrated into your network.
- The machine network can limitless be expanded by adding more PoolBoxes.

Further Advantages of the PoolBox
- Design Data Management: Mini computer (server) for management of design folders for up to 50 ZSK embroidery machines.
- Data Collector: PoolBox acts as a Data Collector for MY.ZSK.
- Server Hardware: Server Hardware for the Easy Positioning System (EPS)

CASTORS

- Easy transport of tubular machines.
- Easy moving in your production site
- Two Brakable castors per maschine for a stable position
- Tested for vibration damping

FRAME GEOMETRY

- Q-Machines are build on a frame which is optimized for side pull through.
- Material can be pulled through without deflection.

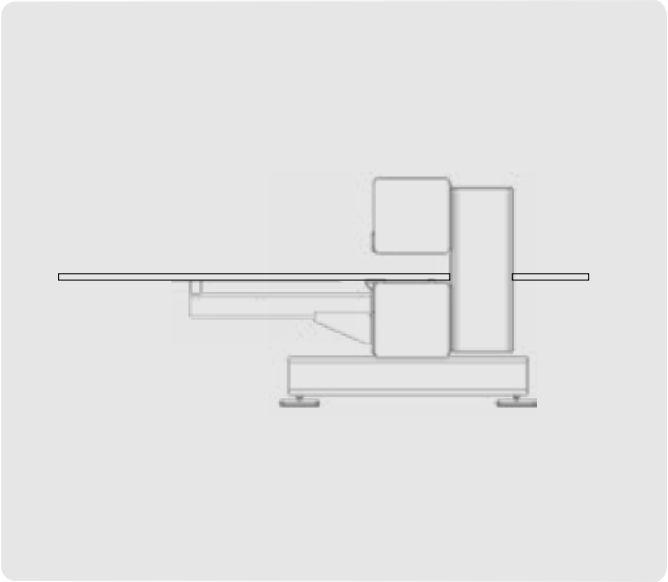
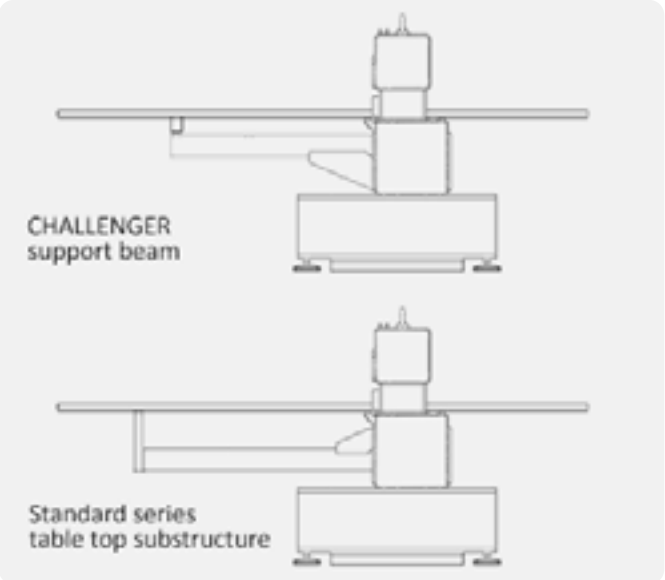
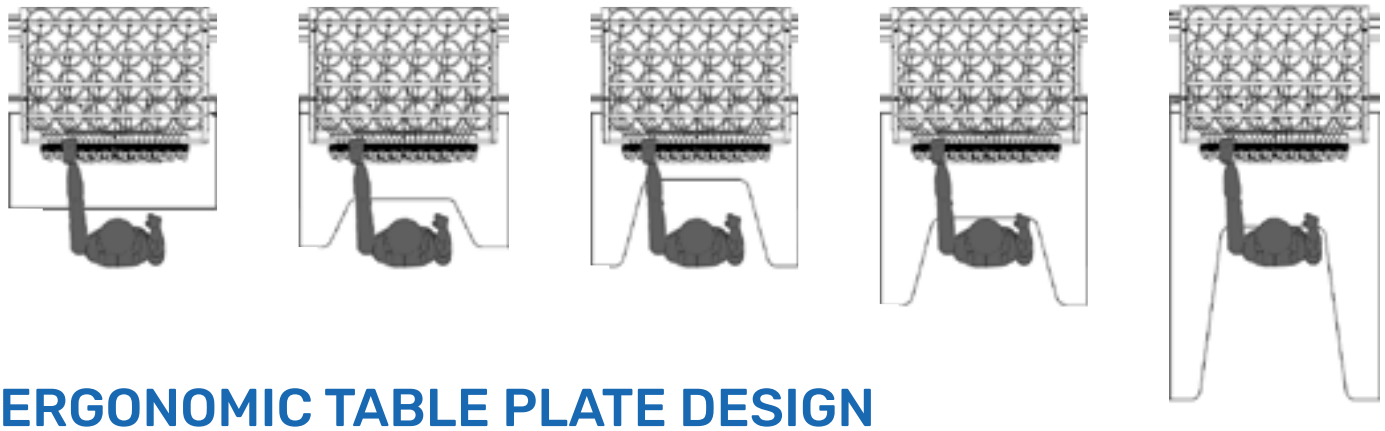


TABLE TOP HEADROOM

- More headroom under the table top of challenger machines for more comfortable bobbin changes.

Competitors may have even flatter support structures. However, our structure allows embroidery field depths of up to 3m.





ERGONOMIC TABLE PLATE DESIGN

- Fast checking of embroidery quality
- Convenient access to thread tension
- Rapid re-threading in the event of thread breakage
- Quicker cone changes.

Embroidery field depth [mm]	Cut out depth [mm]				
	ohne	250	450	600	900
500	✓				
700	✓	✓			
800	✓		✓		
1000	✓	✓	✓	✓	
1200	✓		✓		
1400	✓		✓	✓	
1500	✓		✓	✓	✓

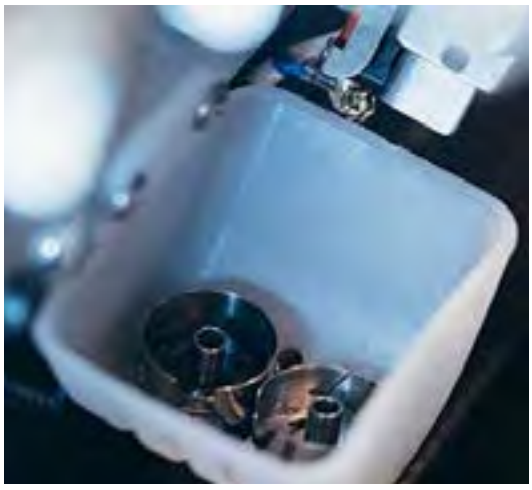
For applications with heavy borderframes or high speed applications we recommend a table top without cut outs. To ensure optimum access in these cases, we offer tabletops with one or more doors.

AUTOMATIC BOBBIN CHANGER

- Never run out of bobbin thread - less downtime!
- Automatic bobbin changes can be set to intervals of e.g. 30.000 stitches.
- Bobbin changes only take 20 sec.
- At all heads the change takes place simultaneously.
- Magazines can be changed while the machine is running.
- Suitable for F- and W-head.
- Matching thread and bobbin thread colour with **Auto Select Bobbin Changer.**

Use Case

Machine	YCF 4405
Embroidery	All-Over within pull-through
Passages	2 hours
Passages / shift	4
Shifts / day	2
Bobbin change	8 minutes (2 operators)



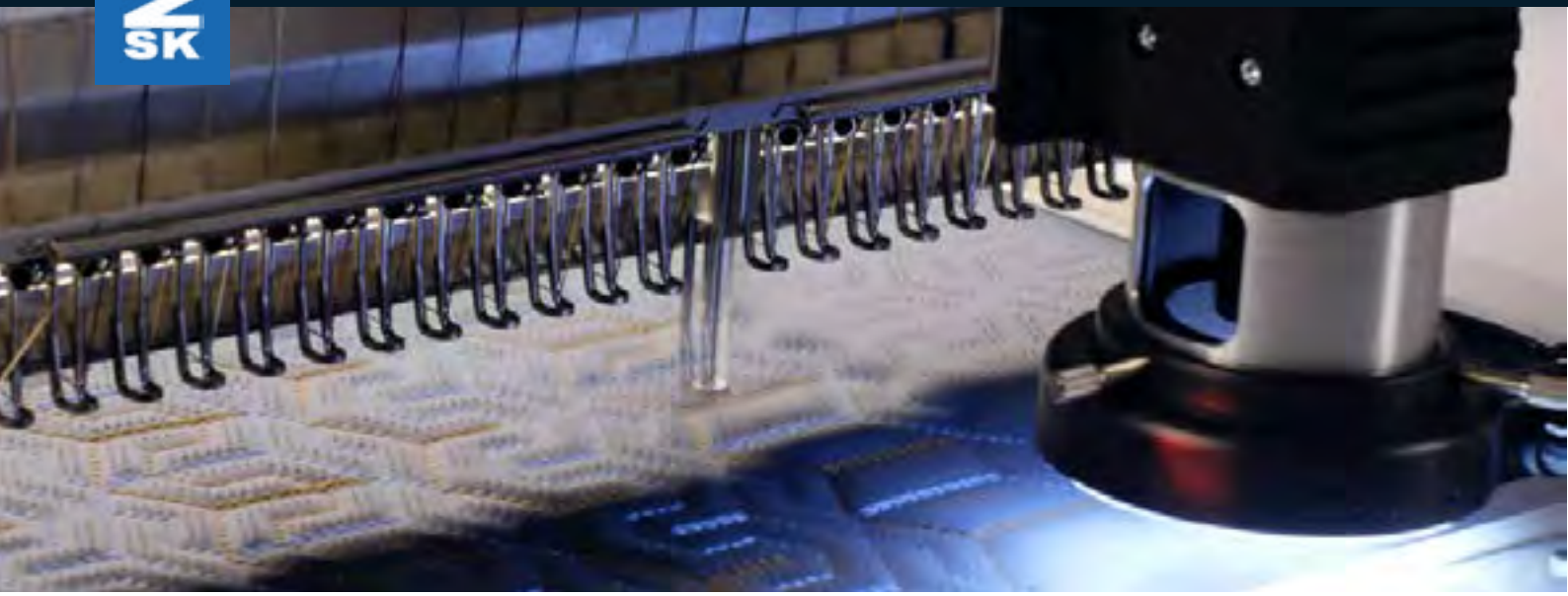
Productivity without Bobbin changer

Downtime / hour	8 minutes
Downtime / pass	2 x 8 min. = 15 minutes
Downtime / shift	4 x 15 min. = 60 minutes
Downtime / day	2 hours
Production time net.	14 hours (2 hours downtime)

Productivity with Bobbin changer

Downtime	none
Time gain / day	2 hours
Production time net.	16 hours

Time gain / day / machine: **2 hours**
Time gain / month / machine: **42 hours**
Time gain / year (252 days) / machine: **504 hours = 63 shifts (8h)**



OPTICAL POSITIONING SYSTEM OPS

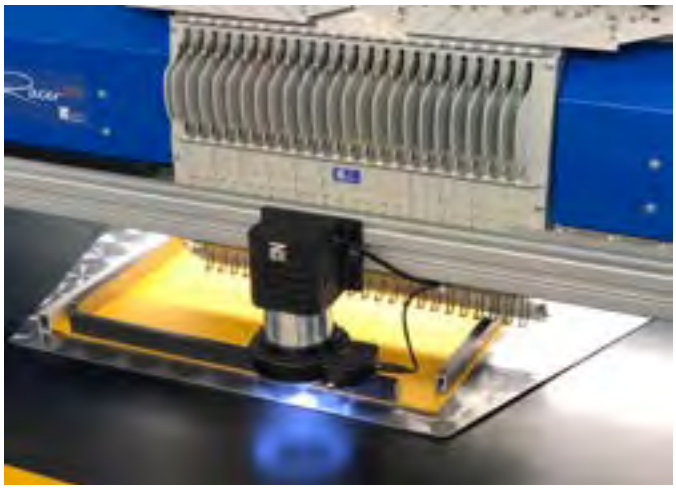
Camera system for accurate embroidery and quilting positioning.
Important for **precise seam placement,** especially in the automotive industry with perforated leather.

- Fully automatic detection of perforation
- Semi-automatic detection of embossings
- Up to 10 scan points per seam
- Seam correction by compression, stretching and rotation

Re-measuring workpiece after each seam for desired position.

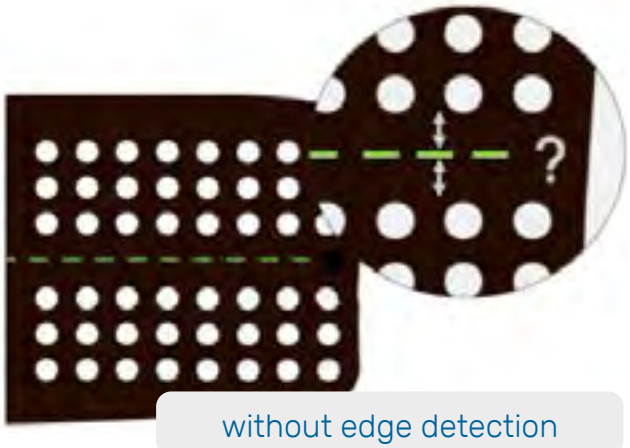
Material changes due to:
- thickness
- temperature
- lacquer
- material contraction during stitching

Requirements:
- Single Head machine
- EPCwin
- Training for OPS2 and EPCwin

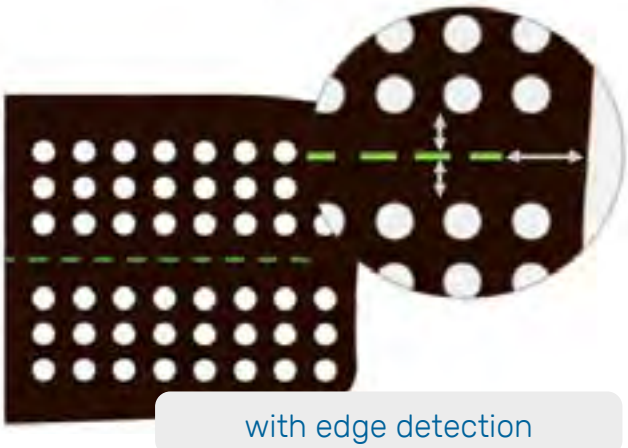


OPS2 scope of delivery:
- Camera
- Laptop

Optional features:
- Ergonomic T8 mount
- Scanner mount
- Camera protection
- Area Light

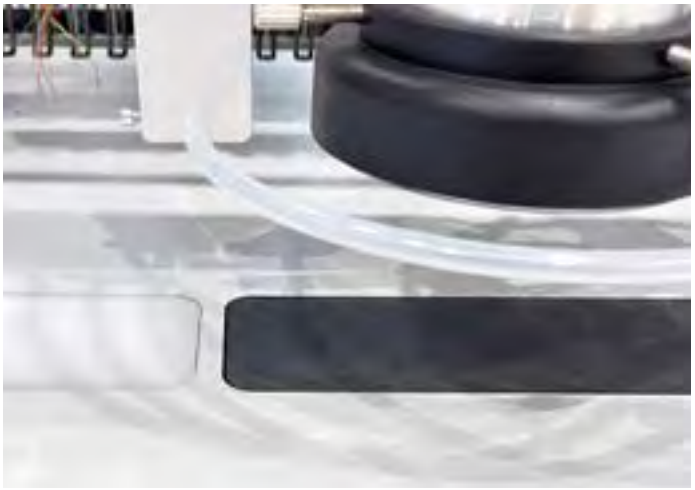


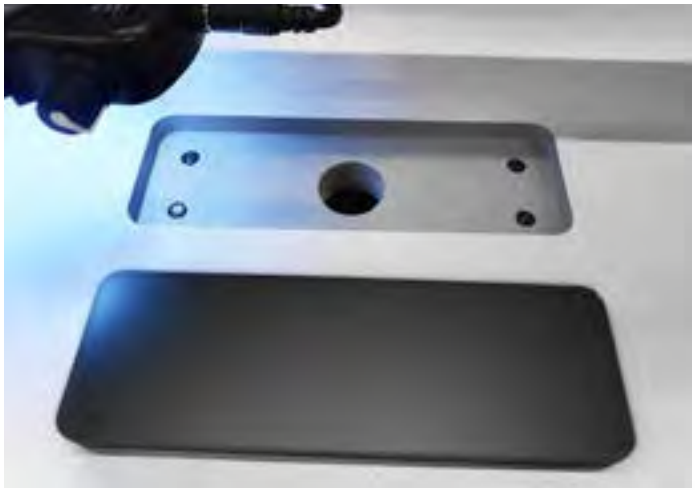
without edge detection



with edge detection

Edge detection
- Edge detection using contrast plates and software
- Enables detection of perforation gaps and leather edges
- Allows alignment of the seam with the perforation and defined distance from the leather edge.





Contrast plates
Contrast plates available in black and white for optimal contrast between the material and tabletop

Area light: Art.No.: 361.036.903
Optimal illumination for the best possible contrasts.
Ideal for leather edge detection.
Retrofitting existing OPS2 camera system possible.

Camera protection: Art.No.: 361.036.902:
To avoid unnecessary recalibration due to impacts, e.g. by incautious opening of the frame cover.

OPS III

Elevating Automotive Interior Precision
The primary evolution from OPS II to OPS III lies in how the machine „sees“ the material. While OPS II relies on visual contrast (2D), OPS III utilizes topographical scanning (3D/Height), unlocking completely new design possibilities for automotive interiors.

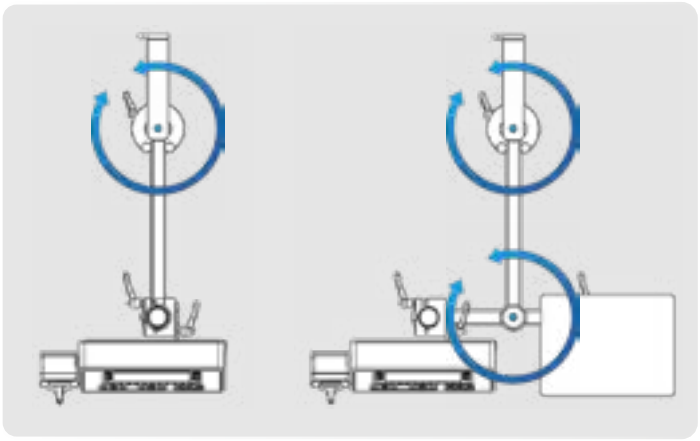
Feature	OPS II	OPS III
Vision Technology	**Static Black & White Photo** Takes a snapshot and applies filters.	**Line-Scan Camera** Scans the surface topography dynamically.
Detection Method	**Contrast Recognition** Relies on light vs. dark (holes vs. material).	**Height/Structure Recognition** Detects variations in material height.
Primary Capability	**Perforation Only** Excellent for standard perforated leather.	**Perforation + Embossing + Welding** Recognizes 3D surface structures.
Design Limitation	Cannot detect embossing or tone-on-tone textures (blind to height).	**No Limitations** Aligns embroidery to embossed logos, welded lines, or prints.
Edge Precision	Standard positioning based on holes.	**Advanced Edge Detection** Measures cut part edges for exact back-tack positioning.

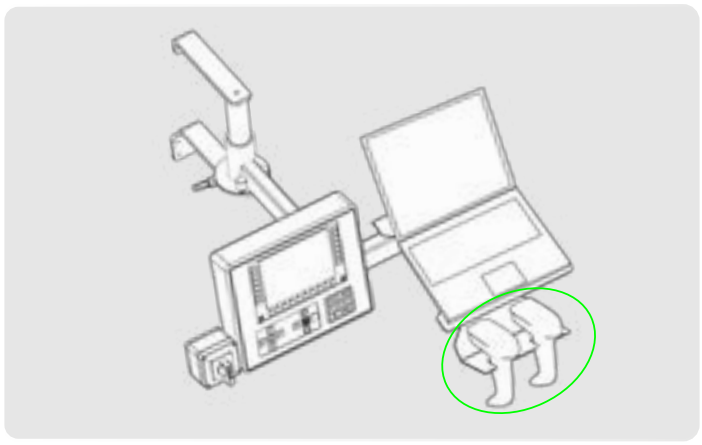
ERGONOMIC T8 MOUNT

- Ergonomic machine operating
- Operating close to the embroidery material
- Swivellable to desired position
- Adjustable to desired height
- Modular mounting system
  Single and Twin mount available
- Space-saving, as no additional table for a laptop is required.

Single mount RACER:
Recommended for large embroidery field depths

Twin mount RACER:
Recommended for parallel working with laptop and T8 (e.g. when using camera systems)





Twin barcode scanner mount:
Art.No.: 361.001.852:
- holds one or two barcode scanners
- Scanners are always in reach
- Twin mount RACER required

Twin mount flatbed:
Art.No.: 270.001.948:
- Suitable for current CHALLENGER and FLAT SERIES machines.
- Recommended for parallel working with laptop and T8 (e.g. when using camera systems).

TABLET SOLUTION

- Touch Screen Monitor with customer specific applications
- Keeping track of Maintenance processes
- Access to manuals or process data

There is a possibility to retrofit the ergonomic T8 mount with accessories such as notebook holders, tablet holders, and barcode scanners, etc.

However, whether a retrofit is possible depends on the type of machine and the year of manufacture. Each case needs to be examined individually.

PNEUMATIC

Connection
Frames can be connected manually or via a pneumatic connection. The second option reduces downtime and increases efficiency and usability.

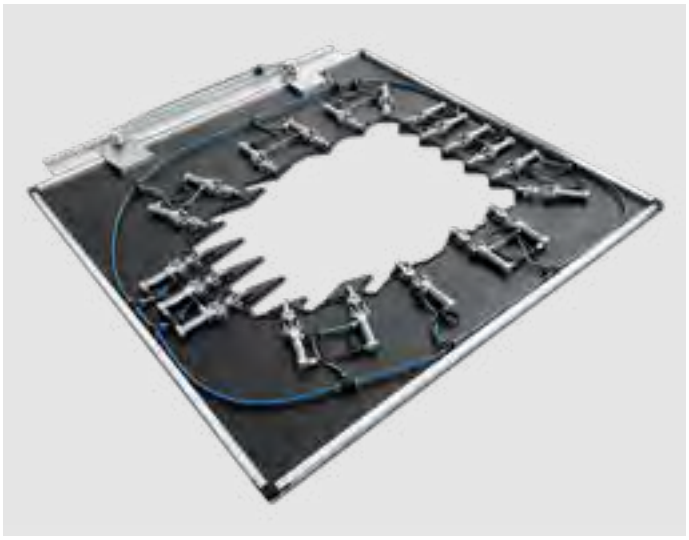
Clamping
- Closing all clamps with one single operation.
- Significantly increases efficiency in production.
- Ensures that all clamps are closed, preventing: scrap parts, collisions.

Operating
Pneumatic clamps can be operated by hand valve or by electric foot pedal.

Pneumatic installations require compressed air at 6 bar.

CUSTOMIZED FRAMES

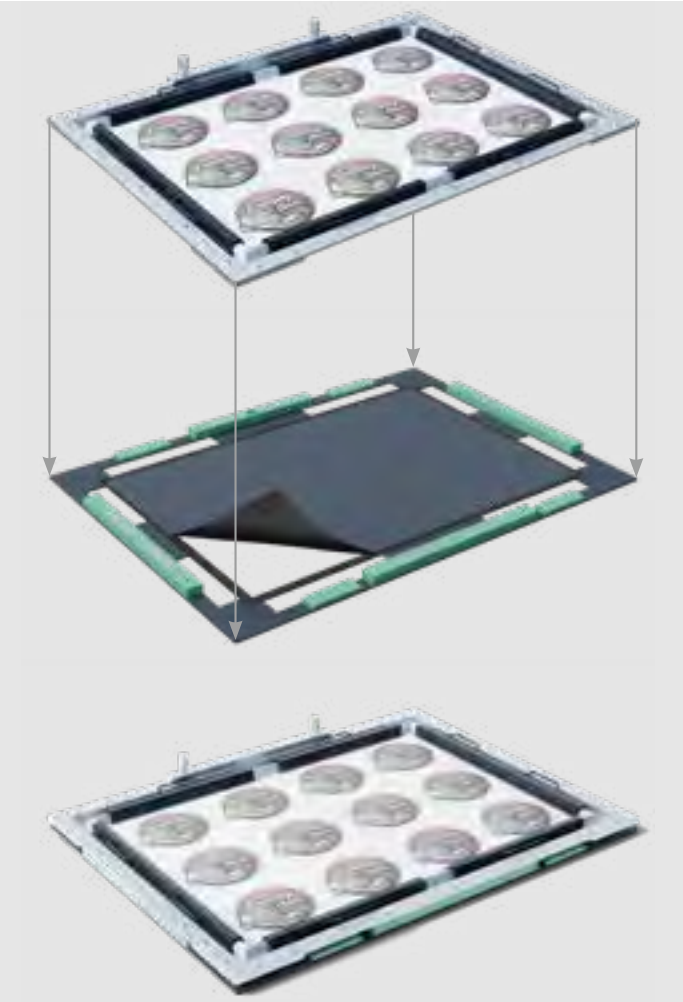
- For single or multi-layer materials (e.g. leather, foam and fleece).
- Ideal for automotive applications.
- Adapted to material border, thus less waste of leather.
- Lightweight GFRP frames.
  Higher embroidery quality due to lower mass driven by the pantograph.
- Compatible with OPS2 camera.



TOWEL FRAME

- New Towel Frame for wide-area embroidery on towels
- Embroidery across the entire towel width within a defined corridor
- Eliminates the limitation of small, pre-defined embroidery zones of standard single frames
- Suitable for flatbed and Racer machines with >700 mm embroidery field depth
- Maximum embroidery area: 558 × 155 mm
- Embroidery width adjustable 54,5 - 155 mm
- Designed for Z-connection

HOOK&LOOP FRAME



- Hook material stays fully intact, maintaining its strength and functionality.
- Each patch gets a perfectly positioned seam thanks single frame and embroidery file.
- The process is simple, efficient, and ensures professional results every time.
- Optional post-processing with laser possible.

This approach guarantees consistent, high-quality patches with hook tape.

Process:

1a. Embroidering Decorative Patches
1b. Positioning of Hook Material
2. Connecting Embroidery to Hook Tape

HOOPSTATION (EASY POSITIONING SYSTEM)

- Project your embroidery designs onto the HoopMaster and the garment.
- Use integrated selection of virtual MightyHoops.
- Fast, accurate and repeatable hooping.
- No loss of time due to tracing.
- No needle breakage due to contact with a frame.
- Digital rulers and grids.
- Saving templates and operator settings.
- Embroidery designs can be loaded by barcode.

- Exclusive ZSK feature
  .z00 files can be moved in the frame and a new .z00 file is created which can be loaded on the machine.

HoopStation
Website

Easy Hooping
Video

Functions
Video

SHORTCUTS (BARCODES)

Features of servo driven machines

- Load your design with its starting point, stops and head selection from network using barcodes.

- Load the corresponding import settings also by barcode (e.g. design rotating for cap embroidery)

- Load frame with field limitation and center using barcodes.
  No more tracing, no more needle breakage due to contact with the frame.

POWER FAILURE BACKUP

Feature of servo driven machines

- Your machine saves the current pantograph position in case of a power failure. The embroidery process can be continued without any displacement.

EASY ALIGN

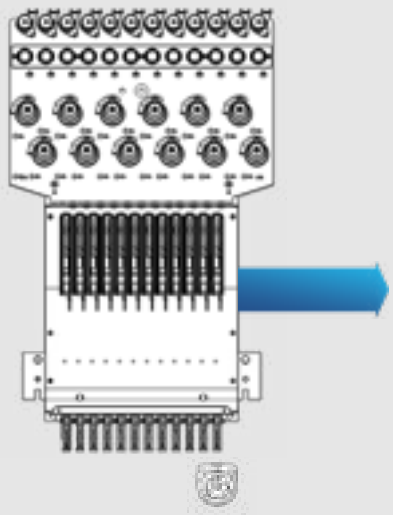
Feature of servo driven machines

- Rotate your design along two points on the T8 controller to align it to non properly hooped items.

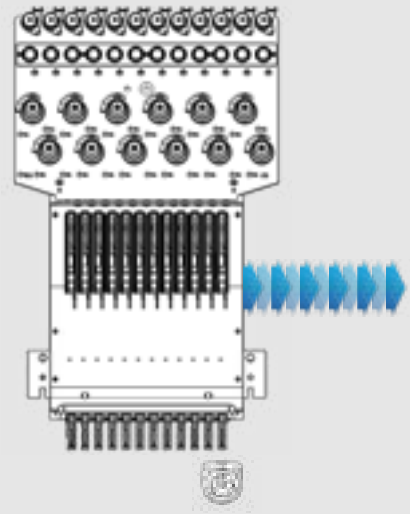
- Especially helpfull, when garment requires very precise placement.

FAST COLOUR CHANGE

While the conventional colour change changes needle by needle, the fast colour change proceeds steplessly. When changing from needle 1 to needle 12, the fast colour change is about three times faster.



Fast Colour Change



Conventional Colour Change

FAST CATCHER

The fast catcher is about 50% faster than the conventional catcher.

Use Case

Stitches / hour	40.000
Colour changes / hour	28
Catcher operations / hour	28
Savings / hour	126 seconds
Savings / day (2 shifts)	2.016 seconds
Savings / year (252 days)	17,5 shifts (8 hours)

Depending on the design, customers can achieve savings of up to 10%.

THREAD K-HEAD

- 6 or 12 thread colours
- Different thread tensions are needed for chain and moss embroidery. Switching of the thread tension is now controlled by the embroidery pattern and is thus fully automated. ➕

Thread racks for the K-head
In addition to the conventional yarn racks, there are two more opportunities:

Art.No.: 302.009.907
Suitable for cones up to 190 mm in diameter and 170 mm in height.

Art.No.: 302.009.905
Angled feed enables the use of large cones and the feeding of several strands of material via one eyelet.

This rack is used, for example, for feeding very thin, conductive yarns for e-textiles.

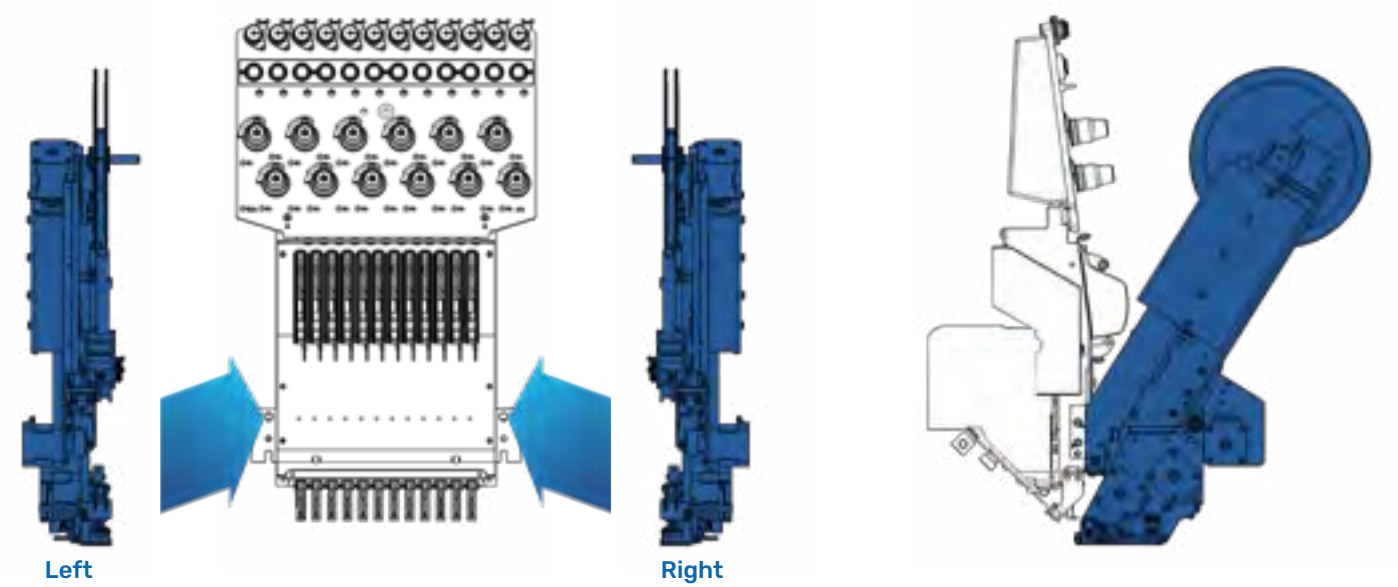
Retrofit kit switchable thread tension K-Head
Different thread tensions are needed for chain and moss embroidery.
The thread tension can be switched on and off by the embroidery pattern and is thus fully automated.

Requires compressed air at 6 bar.
Retrofit kits for 6 and 12 colours available.

Kit for 6 colours **Art.No.: 309.998.903**
Kit for 12 colours **Art.No.: 309.998.905**

DEVICES

Regardless of their number of needles, F-heads can be equipped and extended with additional devices. Many of the devices are available in right and left versions. A center solution allows up to 3 devices to be installed on 18 or 24 needle heads.



Left

Right

- Sequin Devices
- Bead Devices
- Cord Device
- Hot Air Cutter
- Laser Device (Seit)
- Boring Device
- PCB Placement Device
- Cam Stitch (GMI)
- Cord/Loop Device
- 3D Loop Device

SEQUIN DEVICES

- Embroidery speed: 1.000 RPM
- All sequin devices are powered by stepper motors. No air connection required.
- Adjustable to different hole spacing
- Three twin devices enable embroider patterns with up to six sequins.
- Patterns with up to 12 different sequins are produced by D-drive (double travel).
- Retraction of the sequin foot for thread trimming improves the performance compared to lifting the entire device.
  Preconditions: MCP35 with CON-Module; Twin Sequin Device

Type	Single	Twin	Sequin sizes [mm]	Area of application
T7		✓	2-9	Standard sequins
T8		✓	2-9	Supporting low quality sequin reels
V6	✓		3-9	**Standard sequins**
V9	✓		3-19	**Standard sequins - optimized handling**
Rhinestone	✓		3-9	Rhinestones
Function	✓			LEDs, thermal sensors, RFID chips, antennas, Bluetooth chips or even entire microcontroller circuits

Modifications compared to previous versions

- Adjustability without tools - Optimized handling
- Higher embroidery speed - Older models 700 RPM or 850 RPM
- No more air connection required
- More precise cutting of the reels - Higher quality
- Retraction of sequin foot - More efficiency

BEAD DEVICES

Embroidery speed:	800 RPM
Possible bead diameters:	2/2.5/3.0 mm
Bead height:	1.5 to 1.8 mm.
Minimum diameter bead hole:	0.9 mm

- Single- and Twin-Bead device available.
- All bead devices are powered by stepper motors.
- No air connection required.
- Two twin devices enable embroider patterns with up to four beads.
- Patterns with up to 8 different beads are produced by D-drive (double travel).

CORD DEVICE

Try our ZigZag EP1.2 cord device to work precisely with fancy yarns, cords, and necklaces.
This patented equipment allows for secure laying and crimping, and you can even add sequins to your embroidery.

Cord device for technical embroidery
Suitable for Tailored Wire Placement

HOT AIR CUTTER

- Creating 3D cuts
- Engraving fleece products
- Especially suitable for synthetic materials
- Suitable for tubular machines

LASER DEVICE

- Laser cutting of applications
- Multilayer application + reverse application
- Laser boring
- Adjustable intensity and cutting speed
- Separate laser control unit triggered by commands in the embroidery design

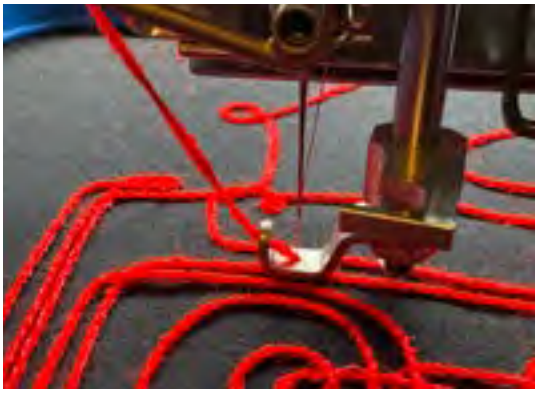
BORING DEVICE

The borer is a stitch tool with four sharp edges that bores a hole in the fabric.
The needle and the thread open the hole and embroider around it.

CORD/LOOP DEVICE

- Inexpensive way to imitate the chenille look
- For ZSK embroidery machines with F-head
  Note: This setup occupies needles 11/12 or 17/18 on your embroidery machine.
- Eight different feet are available for embroidering different thread or cord thicknesses, for material thicknesses from 0.9 mm to 3.0 mm.
- The cord/loop device is supplied with two feet (1.3 mm / 1.5 mm) as standard.

Left: Art.No.: 270.012.911
Right: Art.No.: 270.012.912



3D LOOP DEVICE

- World first – 3D loop effect for cap embroidery
- Create striking 3D loops on border frame, tubular, and cap embroidery.
- Easily adjustable loop height, programmable directly during digitizing with the .z00 transport code.
- Can be retrofitted to existing machines (models on request).
  Note: Special Software and Sequin Device Preparation required.
- Use two colors in a single design with the left and right device.

Left: Art.No.: 270.012.923
Right: Art.No.: 270.012.924

PCB PLACEMENT DEVICE

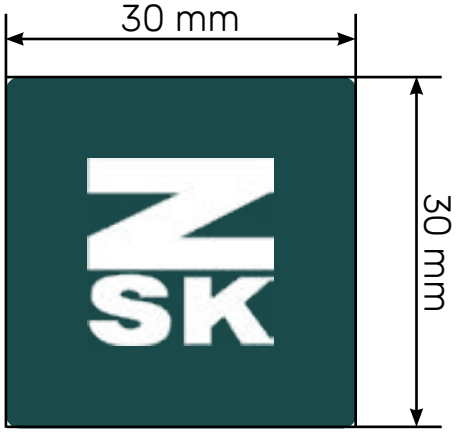
PCB Placement Video

- Automatic PCBs placement on your fabric by the high-accuracy robotic feeder.
- The boards are stored in a magazine.
- The circuit boards are then fixed to the fabric by thread and needle.
- The electrical connection of the PCBs can be embroidered by a conductive thread automatically.

The embroidery machine can complete electrical circuitries including PCBs, sensors, actors, and tracks in a fully automatic and highly scalable fashion.

Conventional Production

STEP1: Embroidering guidline for placing the PCB on the fabric.
STEP2: Manual placement of the PCB on the fabric by using double sided tape.
STEP3: Connection of the PCB via separate embroidery file.



Standard size PCB boards: 30x30 mm.
Deviating sizes may be possible.
Please consult for further information.

CAM STITCH (GMI)

CamStitch (GMI)
Video

- A camera shoots a picture of the appliqué, patch, print or pre-embroidery on the hooped garment.
- Outlines for fixing appliqués can be created automatically.
- Placing a second embroidery design next to it without offset problems.
- Combining print and embroidery.
- Additional Laptop required. Ergonomic T8 and Laptop mount recommended.

Conventional Production of Appliqués

STEP1: Embroidering guidline for placing the appliqué on the fabric.
STEP2: Precise placement of the appliqué on the fabric by using double sided tape.
STEP3: Embroidering manually punched outlines.

COLOREEL

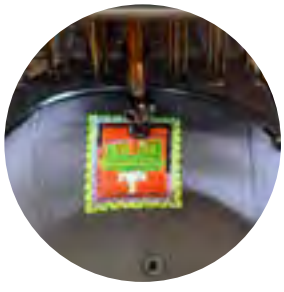
- Exactly the right colours:
  The Coloreel unit offers unlimited colours and always provides exactly the right colour when needed.
- Amazing colour effects:
  Rapid colour changes or smooth transitions between any solid colour.
- Increased productivity:
  Only one thread reel, no unnecessary trims and lock stitches give faster production.
- No thread waste:
  Dyeing only the amount of thread required reduces waste.

Coloreel Connection Box

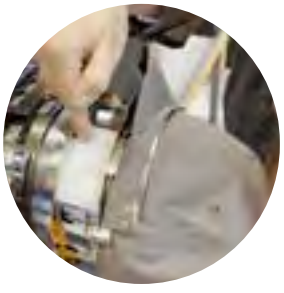
- Direct communication between Single Head ZSK and Coloreel for significantly more precise synchronization compared to the simple Coloreel stitch counter
- Exchange of stitch position
- Allows better repeatability of design quality and colours

Coloreel Toolbox Solution

- Sharp colour changes:
  Colour transitions outside the embroidery area (waste area) for sharp colour shifts within the design.
- Easy use of existing designs:
  Add Coloreel to existing embroidery files without creating separate punch files – saving time and integrating seamlessly into your workflow.



Sharp Color Transitions



Waste Area

PREMIUM CAP DRIVE

- Easy connect system
- Extra rigid connection for even more precise embroidery results
- Upgrade for existing machines
- Suitable for all Racer and Sprint models
- Different connections Sprint and Racer!

Art.No.: 361.028.944
Premium Cap Drive RACER

Art.No.: 361.028.951
Premium Cap Drive RACER 6W, 8S

Art.No.: 360.028.914
Premium Cap Drive SPRINT

Art.No.: 360.028.915
Premium Cap Drive SPRINT 8

Art.No.: 360.998.913
Upgrade Standard to Premium Cap Drive RACER

Art.No.: 361.998.906
Upgrade Standard to Premium Cap Drive SPRINT

Cap frame with spring tension element

SPRINT

RACER

SPRINT
Upgrade Standard
to Premium

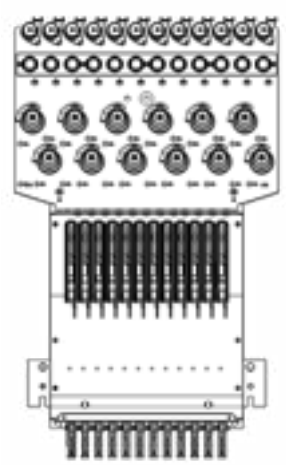
RACER
Upgrade Standard
to Premium

Cap frame with spring tension element
- Easy clamping of the caps
- Prevents excessive or insufficient clamping when fastening the caps
- Tolerates different material thicknesses of the caps
- Prevents damage to the caps
- Standard since 01/2025
- Embroidery field depth max. 90 mm (70 mm before software release (19-03-2025)
- Embroidery field width max. 360mm

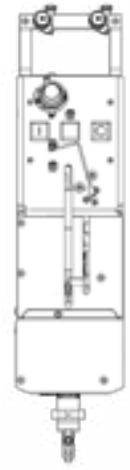
Art.No.: 571.408
Upgrade Clamping Ring

Art.No.: 361.028.946
Cap Frame (Optimized design, compatible)

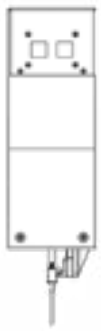
EMBROIDERY HEADS



F-Head



W-Head



K-Head

R-Head

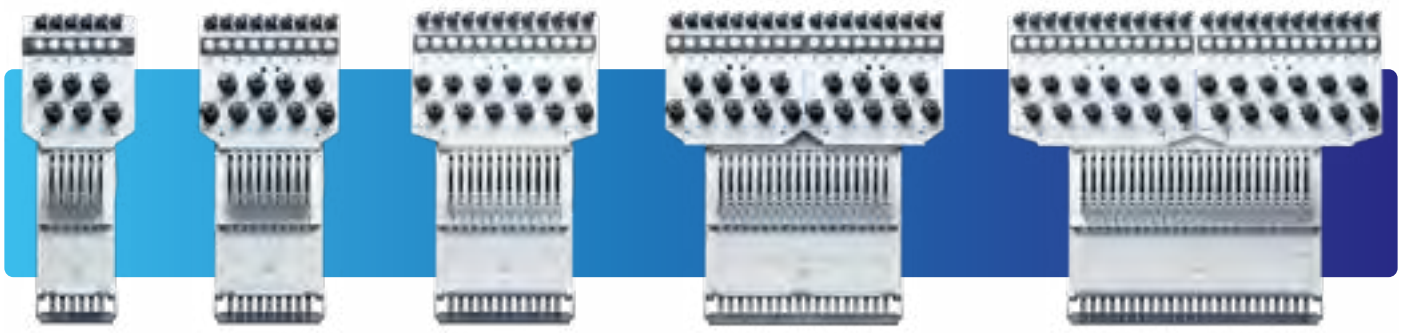
Possible Combinations

F-Head + K-Head = H-Machine
F-Head + W-Head = Z-Machine
F-Head + K-Head + W-Head = V-Machine

Due to the shaft position, the R-Head can only be combined with the K-Head!

Combination machines

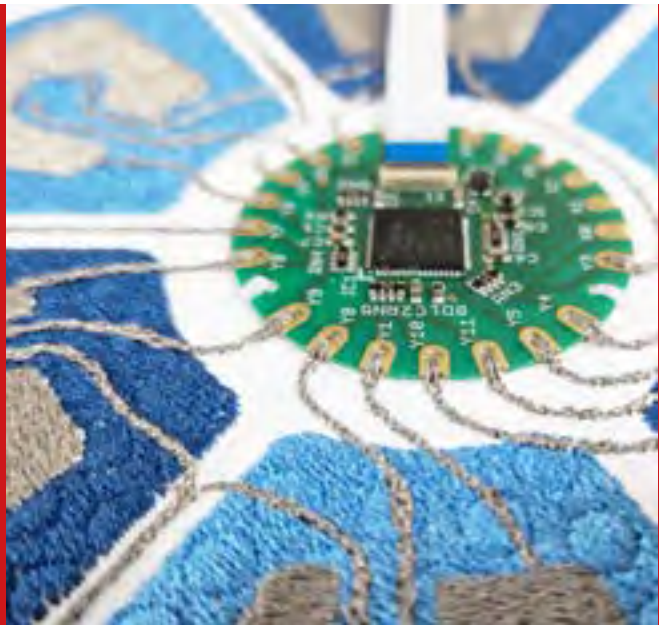
F-HEAD



- Standard embroidery head for decorative embroidery
- Available with 6, 9, 12, 18 and 24 needles / colours
- Embroidery speed up to 1.200 RPM
- Base for additional devices (e.g. sequins, beads)

F-Head for technical embroidery

- Traditional yarn for decorative purposes
- Create functional fabrics by using conductive thread.
- Automated implementation of electrical connections, LEDs and / or RFIDs through Function Sequin Device.



F-HEAD OPTIMIZATION

- Noise reduction by optimized needle bar drive and sliding surfaces.
- Enhanced embroidery quality due to optimised precision:
  1. Improved thread feeding, due to longer take up lever.
  2. Improved bearing for needle package 9N and 12N.
     Bearing for 6N, 18N, 24N already geometrical optimised.

Parts:

- Retrofitkit **Art.No.: 270.998.993**
  - Cam **Art.No.: 270.003.894**
  - 2x Screw M3x6 **Art.No.: 307.002**
  - Magnetic holder **Art.No.: 270.003.895**

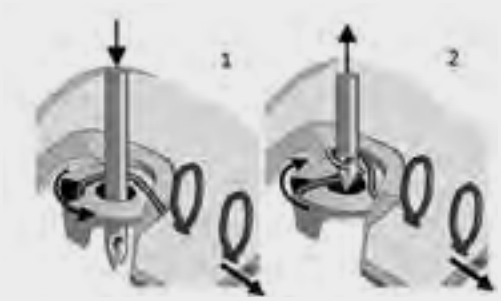
- Lead **Art.No.: 270.003.431**
  - Thread take up lever (incl. sleeve) **Art.No.: 280.003.922**
  - Thread take up lever **Art.No.: 270.003.893**

- Shorter needle block
  This offers the advantage that stitches can be made closer to the frame and the embroidery field can be used more efficiently.
  Especially for the automotive sector and in combination with our customized frames, this is a major advantage.

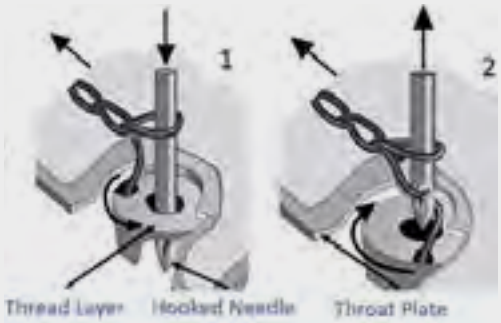
K-HEAD

- Embroidery head for chain and moss embroidery.
- Embroidery speed up to 750 RPM
- Available with 6 or 12 thread colours
- Fully electronically driven - customizable stitch formation
- Different thread tensions are needed for chain and moss embroidery.
  Fully automated switching of the thread tension via the embroidery pattern.
- Correct combination of thread, needle, fabric presser inserts, etc.

Moss embroidery



Chain embroidery

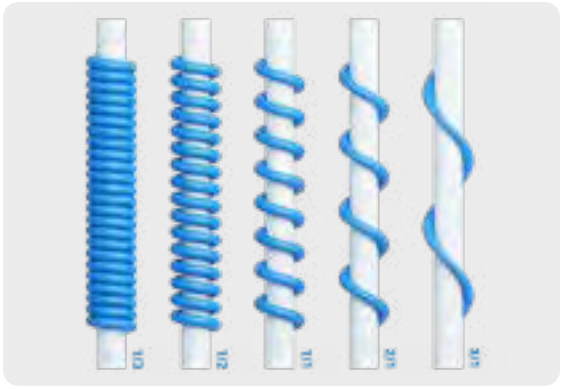


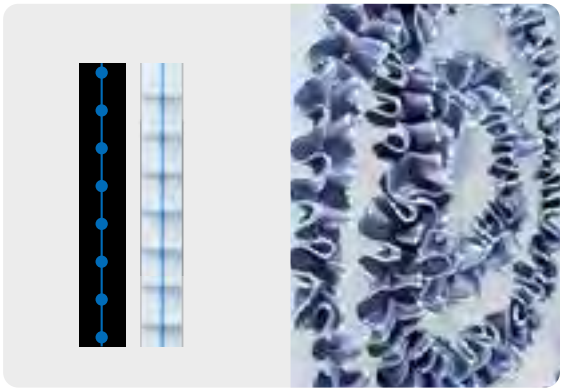
K-Head for technical embroidery
- Creating voluminous and soft surfaces
- Producing high surface area sensors required for smart or medical textiles with conductive thread.

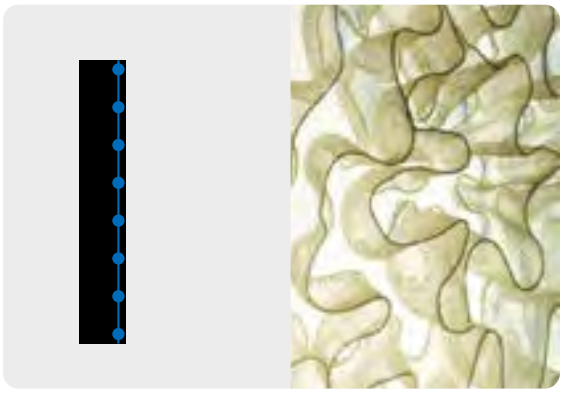
Examples of application
- Workwear with integrated electrodes for ECG or EEG for e.g. long-term monitoring.
- Custom-fit and high-individualized textile electrodes.

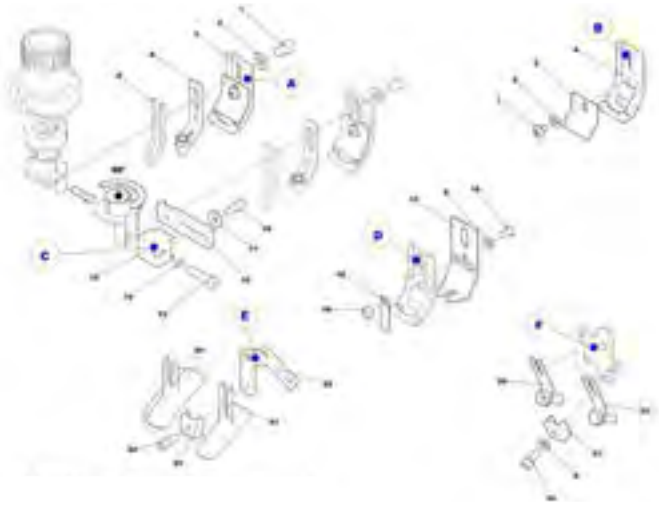
W-HEAD

- Embroidery head for cording, taping and coiling + standard embroidery
- Embroidery speed up to 850 RPM
- Coiling with adjustable winding density
- Unwinding fuction
- 15 different zigzag pattern
  Parameters allow the user to adapt these designs to the supplied media, for example by adjusting the pantograph stroke.
- 3D Effects with frill and sideways embroidery

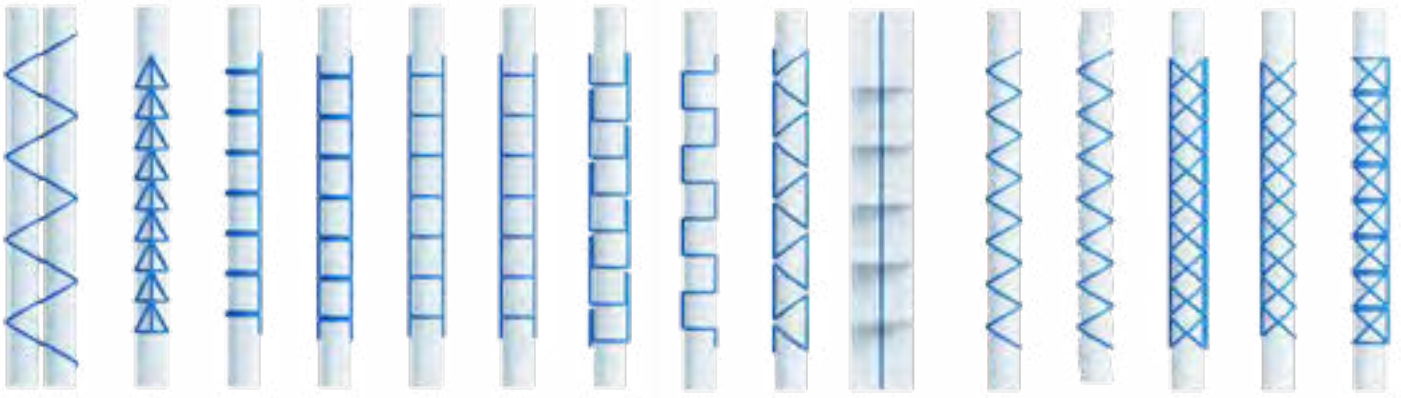








- We offer a **selection of different feet** to ensure the perfect placement of the seam on the medium and to allow effect embroidery.



W-Head for technical embroidery

- The W-Head is the most important embroidery head for technical embroidery.
- It allows the laying of:
    - Fibers (Tailored Fiber Placement - TFP)
    - Wires (Tailored Wire Placement - TWP)
    - Tubes and cables (TTP)

Tailored Fiber Placement

- Drastically reducing waste of material (400%), production costs (30%) and production time.

- High precise positioning of fibers making preforms with localized reinforced areas

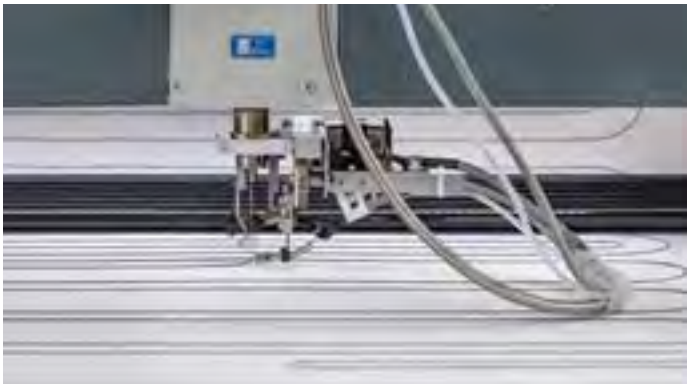
- Combining multiple fibers within the same preform

- Create different thicknesses (up to 7mm) within the same preforms

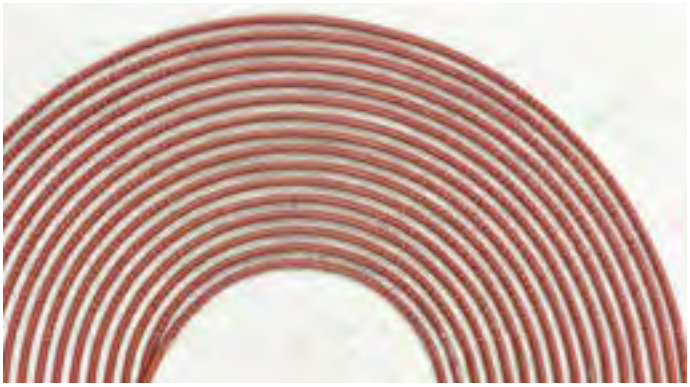
- Highly automated and scalable technology - up to 20 components at the same time

Areas of application:

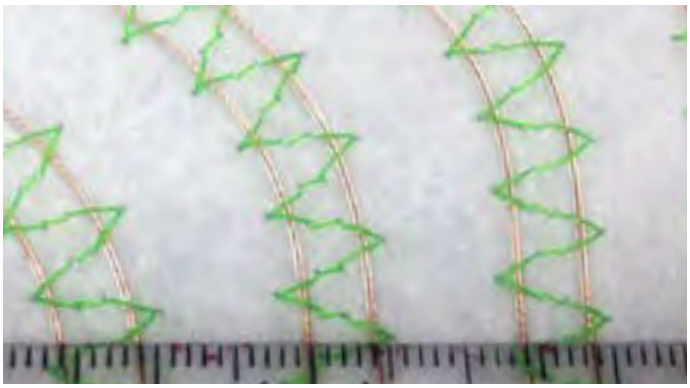
- Car and bicycle rims, arms for suspensions, shoe soles
- Protective equipment (e.g. helmets)
- Wind turbines



Tailored Wire Placement
- Possible diameter: 0.07 mm - 12 mm
- Stainless steel, copper, coated wires, optical fiber cable,hybrid wires such as stainless steel and PES
- Due to embroidery technology - many different geometries can be laid out.



Areas of application:
- Heated clothing
- Infrared heating systems
- Luminous textiles to improve security or comfort
- Embroidered sensors or antennas



Tailored Tube Placement
- Possible diameter: up to 12 mm

Areas of application:
- Integration of tubes into textile reinforced concrete
  e.g. for heat exchange systems
- Suits and vests with tubes for cooling
- Pipe systems for fluids of any kind applied to textile or flexible material
- Ducts for electrical cables and connections

R-HEAD

R-Head features first and second order mass balancing
Reduces torque around the upper beam and vibrations

Enables more precise interaction between needle and hook

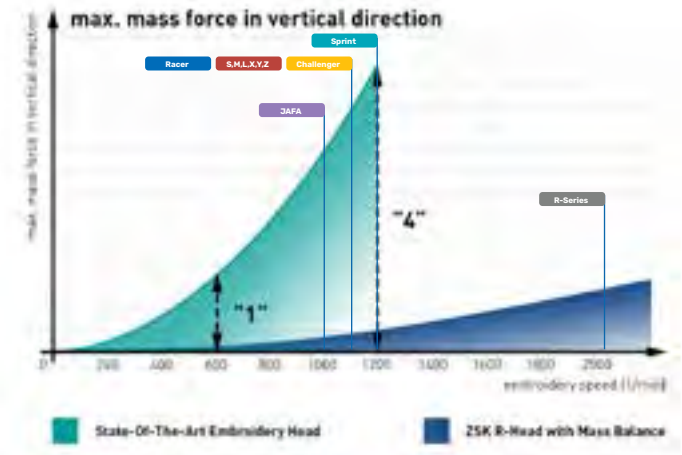
Optimized embroidery quality

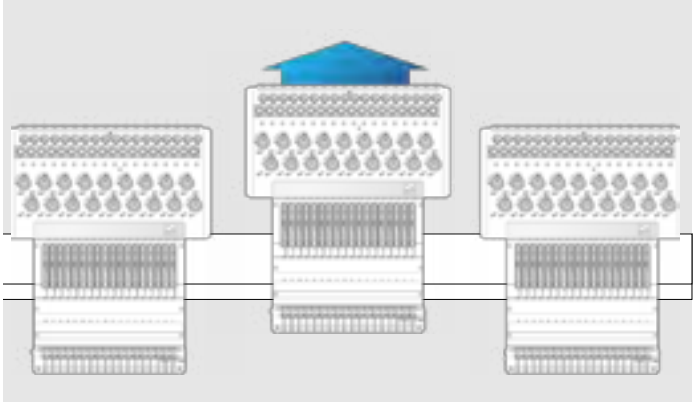
Embroidery speed up to 2020rpm

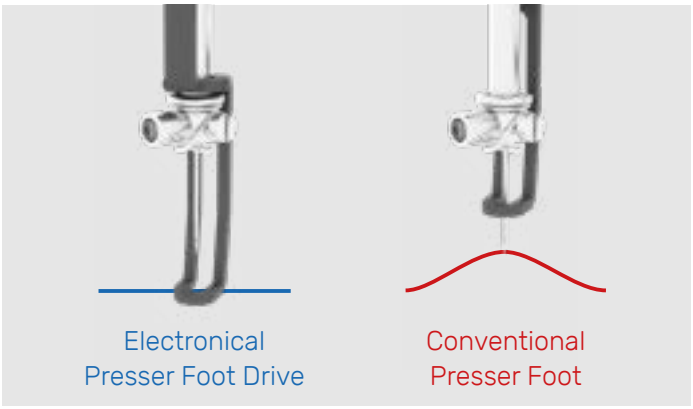
Significant noice reduction

Facts

- Like the F-head, the R-head is intended for standard and decorative embroidery.
- 18 needles / colours
- Embroidery speed up to 2.020 RPM
- Optimized embroidery quality
  - Less skipped stitches
  - Less thread breaks
- Intelligent Presser Foot (IPC)
- Individual needle thread clamps
- Exchangeable embroidery head for highly efficient maintenance
- Snapped Back Overload Protection (SBOP)







SNAPPED BACK OVERLOAD PROTECTION

Facts

- The Snapped Back Overload Protection (SBOP) feature automatically disconnects the drive if the needle bar is blocked, preventing damage.
- Reestablishing the connection between the drive and the needle bar is effortless and does not require dismantling the needle package or spare parts.

COMBINATION MACHINES

Possible Combinations

F-Head	+	K-Head			=	H-Machine
F-Head			+	W-Head	=	Z-Machine
F-Head	+	K-Head	+	W-Head	=	V-Machine

Due to the shaft position, the R-Head can only be combined with the K-Head!

Facts

The combination machines are offered as Single and Multihead Machines in a variety of Head Distances and Field Depths.
Machines can be equipped with 6, 9, 12, 18 and 24 Needles on the F-Head (depending on Head Distance) and 6 and 12 Needles on the K-Head.
The minimum head distance between different head types is 275mm.

RACER Z0118

- F-Head to run Tubular and Cap embroidery
- Both heads can operate together in Border Frame mode
- W-Head – tubular operations possible
- W-Head allows Cording, Taping and Coiling

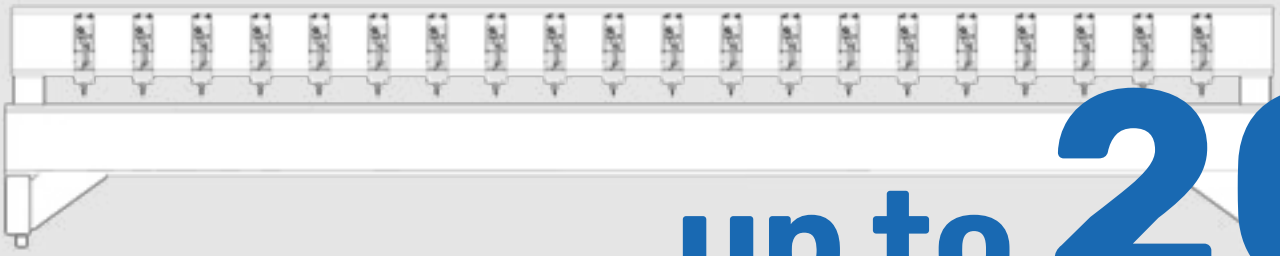
RACER H0118

- Split Table to enable F-Head to run Tubular and Cap embroidery
- Both heads can operate together in Border Frame mode

UP-SCALING

Possible number of embroidery heads

- Flatbed machines: 1-56 heads
- Tubular machines: 1-12 heads
- W-head machines: 1-20 heads



up to 20

components at the same time

Embroidery field size

ZSK offers machines with the largest field size per laying head. The repertoire of ZSK technical embroidery machines ranges from the smallest machine with a laying field size of 600 x 400 mm to the largest of 2.400 x 2.100 mm.

In case of multi-head machines, automatic head switching allows laying fields up to 9.000 x 3.000 mm (27 m²).

Even larger, almost limitless laying fields are possible by using automated **pull-through systems**.

PULL-THROUGH SYSTEMS

Automation

Large Embroidery field

Roll2Cut - Fabric is taken from a roll and fed to the embroidery machine. Once the embroidery is complete, the product is cut into specific pieces and stacked in front of the machine.

Another Roll2Cut System is semi automatically processing with a side to side pull-through.

Roll2Basket - Fabric is unwound from a roll and fed for embroidery. The embroidered strip material is collected in a collection container (Basket).

- Max. roll diameter: 400 mm
- Material thickness: 0,2 - 5,0 mm
- Embroidery field: 150 x 200 mm
- Embroidery Speed 900 RPM

Automatic Winding Station

Type	Max. material width	Min. head distance	Material storage	Compressed air required?
Roll2 Basket + Basket	10 – 150 mm	400 mm	In a container	YES
Roll2Basket + Automatic Winding Station	10 – 150 mm	400 mm	On Winding Station	YES
Roll2Roll Guiding	190/160 mm	495 mm	On a roll	YES
Roll2Roll Clamping	190/140 mm	495 mm	On a roll	YES

Roll2Roll - Semi and fully-automatic embroidery production on belts, tapes and other textile rolls. Multiple materials, i.e. cloth and felt, will be supplied, then embroidered and finally rolled up again at the front of the machine – completely automatically.

- Pull through back to front and side to side
- Various dimensions (single- and multihead)
- For textile and technical embroidery
- Pneumatic clamping and tensioning
- Stamps close to the needle secure **high accuracy of the fabrics position during retensioning.** Pull through back and forth leads to a possible embroidery field multiple times the depth of the frame.
- Custom solutions (e.g. storage magazine)

INLINE SOLUTIONS FOR TAPES AND PATCHES

Use the ZSK Roll2Roll technology to integrate embroidery in an efficient inline production process.

1. Embroidery
- Embroidering on tape/ribbon in a Roll2Roll process **or**
- Embroidering patches on SPRINT 7 Patch Solution

2. Quality control (optional)
- Roll2Roll process for checking on ribbon and embroidery quality on Willy Italiana Checklabel.
- Marks defects in ribbon or embroidery without stopping the continous process.

3. Cutting (optional)
- Cutting patches to desired shape on Willy Italiana Laserlabel

more info:
willy.com

Defining cutting line

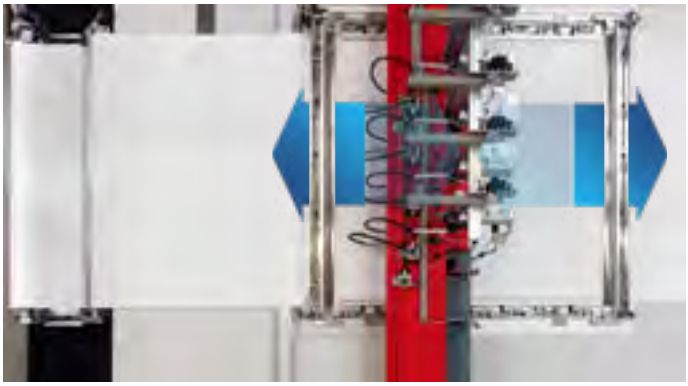
- Camera system detects outlines of the patch automatically
  No CAD data input required, unless the patch is intended to have a different contour than the motif.
- The user selects the contour for cutting, which doesn't necessarily encompass the entire design. Detection necessitates a closed contour.

- Cutting distance to label can/has to be set on the machine.
  To avoid damaging the embroidery, the laser's cutting distance is adjusted according to the design and the nature of the thread.

Further information

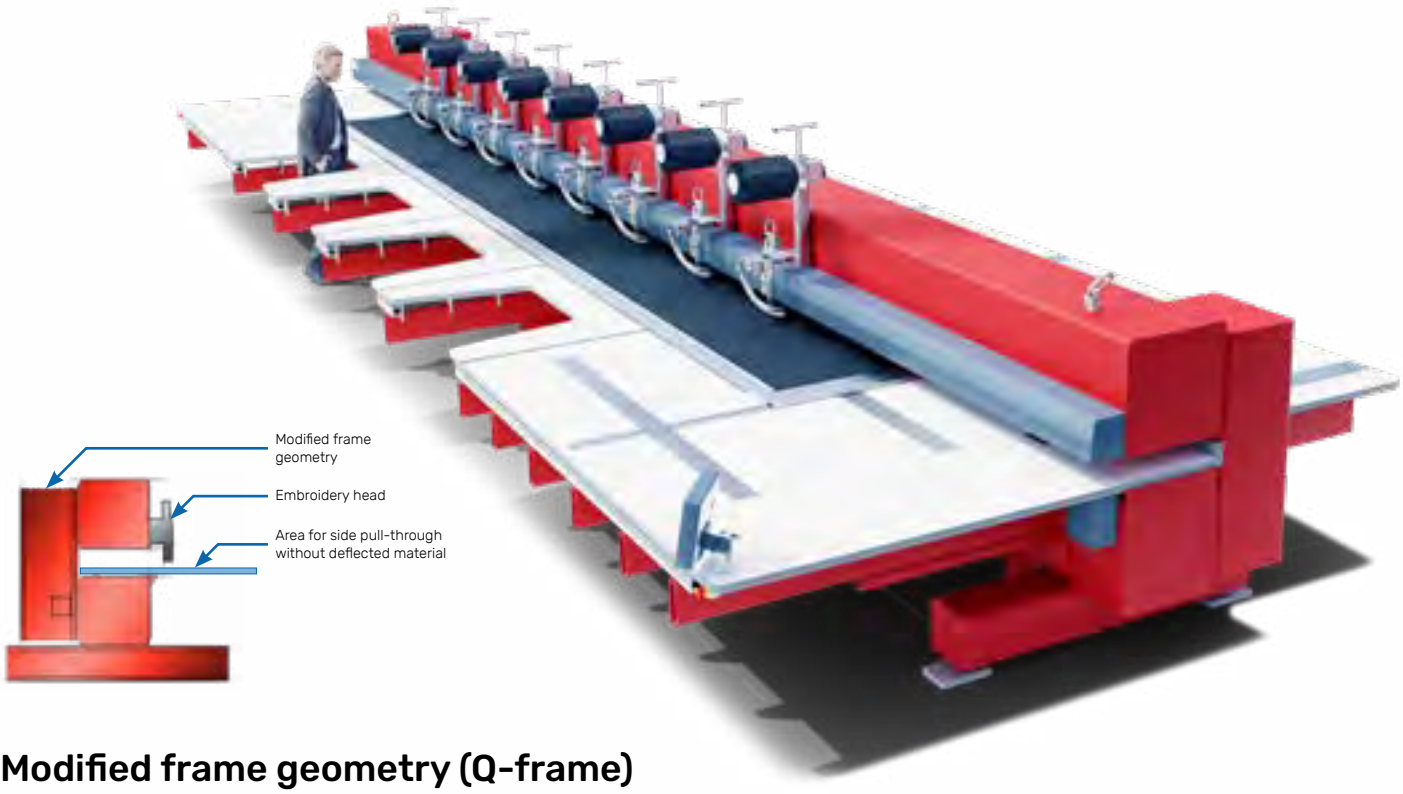
- Working area LxW: 260x200 mm
- Suitable materials: Textile ribbons, Hook&Loop tape
- Non suitable material: Natural fibers
- STEP2 and STEP3 can be connected into a continous inline process.

High accurate retensioning
- Stamps close to the needle secure high accuracy of the fabrics position during retensioning.
- Pull through back and forth leads to an almost infinite embroidery field

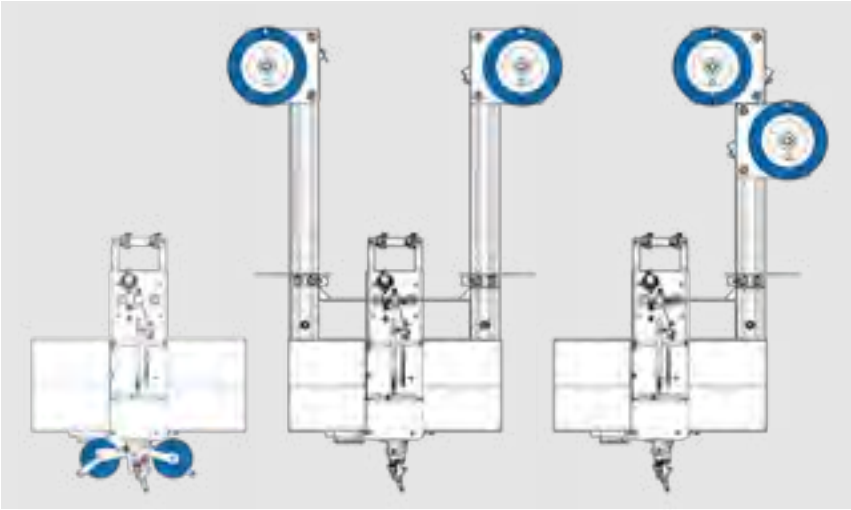


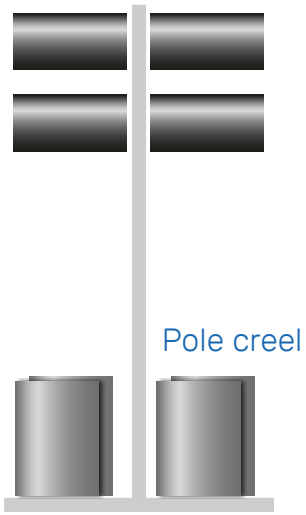
Areas of application:
Heating solution on large scale parts. Electrical connection needs to be on one side.

Size of the part is not limited by the size of the embroidery frame.



Modified frame geometry (Q-frame)
Due to the modified frame geometry, the new side pull-through principle does not cause material deflection.





Pole creel

MEDIA SUPPLY

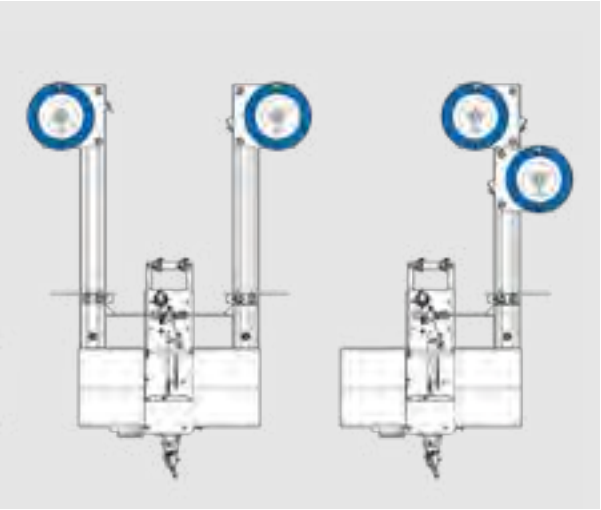
- Active supply unit for tapes, wires or fibers. Up to four wire or fiber strands per head can be fed via a creel from behind the machine.
- Easy access due to portal or pole creel for changing the rolls.

- Laying volume (Fast Laying + HV): **up to 1,433 kg/h**
  Roll size: **5 kg**
  Roll changes per shift: **2-3 /head**

- The Easy Access Supply Creel eliminates the need to climb onto the tabletop to lift the heavy rolls.

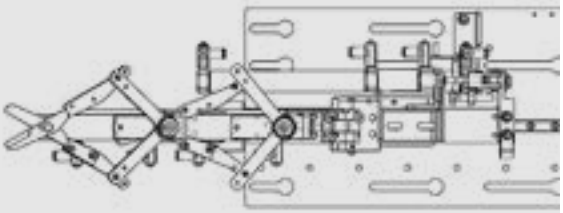
Portal creel

Automated unwinding
- When material is fed from above, the inward rotation of the laying unit would be limited to 360 degrees.
- The automatic unwinding function of the W-head eliminates this limitation.
- This solutions enables laying in spirals for example.



Automated fiber/wire cutter
- The pneumatic trimming system cuts all kind of fibers and even stronger wires.

Wire hit detection
- If a laid wire is hit by the needle the machine stops and indicates the affected laying head.
- The defective part can be marked to be removed.
- In many branches like in the production of heated car seats this function is obligatory.



Automated fiber/wire cutter

Thread end detection W-Head
- End of thread is detected directly at the cone.
- Prevents need for new threading
- Optimized upper thread guidance
- Quick upgrade for existing machines

Art.No.: 270.050.900

Thread end detection W-Head

Carbon protection
The electronics of the machine are protected against carbon dust, to ensure the durability of the components.

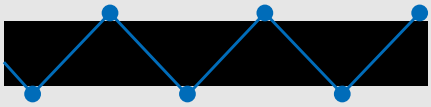
- Filter for carbon dust
- Sealed control panel housing
- Sealed machine racks
- Protective lacquer for circuit boards outside the control panel housing

FAST FIBER/TAPE LAYING

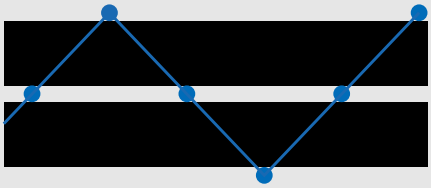
- Fibers (or tapes) are laid at high speed without stitches.
- This method can be used in any angle but the fibers need to be laid in a straight line.
- In curves or turns, the fiber is fixed by stitching.
- Reasonable especially for large components
- Patented technology.
- Laying volumen: up to **0,762 kg/h**

HIGH VOLUME TFP/TAPING

- Parallel placement of two or more fiber strands or tapes.
- Doubles the placement volume of fibers/tapes.
- Patented technology, drastically increasing productivity for mass production.
- Laying volumen: up to **0,852 kg/h**



Standard Technology
for laying one fiber strand



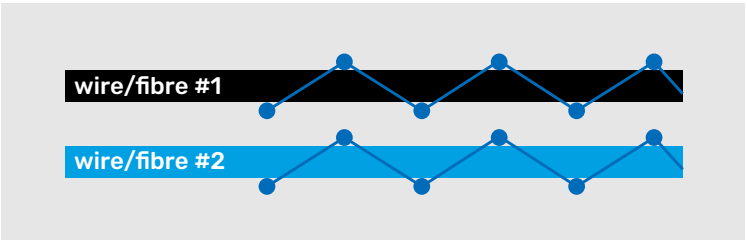
High Volume Method for laying
multiple fibers/tapes

Combining Fast Fiber Laying + High Volume up to **1,433 kg/h**

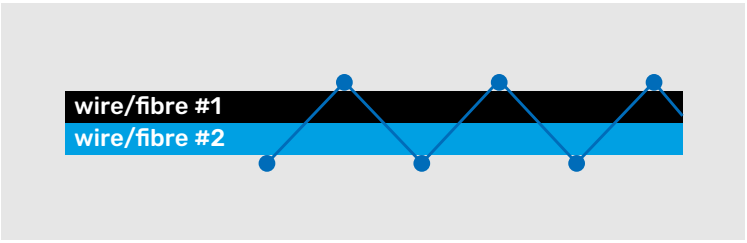
up to
300%
increase in performance

POSSIBILITIES OF WIRE/FIBRE PLACEMENT

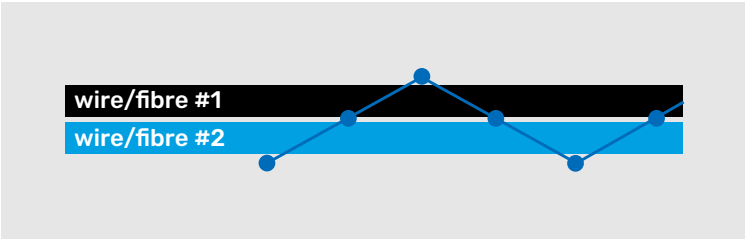
1. Single Wire/Fibre Placement



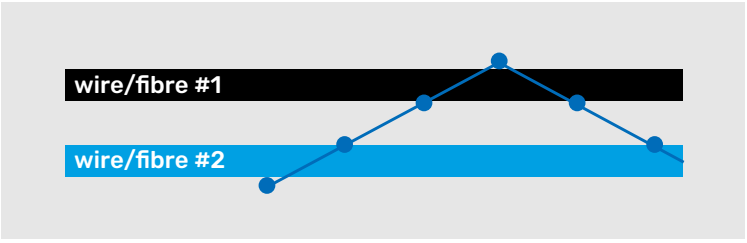
2. Parallel Double Wire/Fibre Placement (no stitch between)



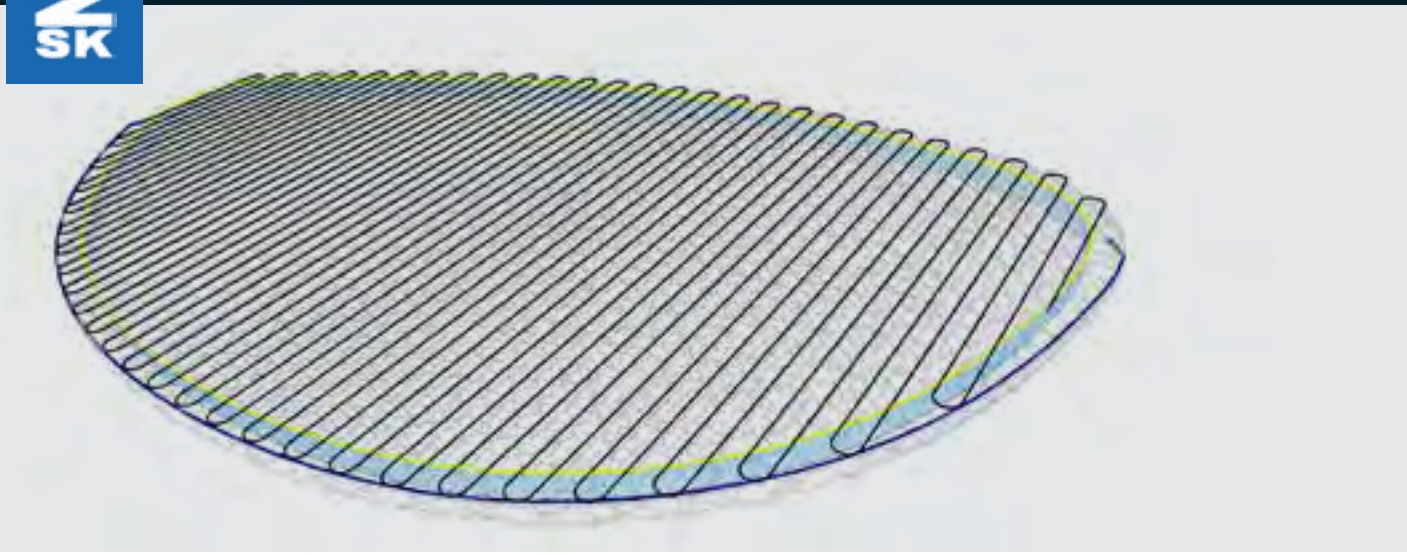
3. High Volume (HV) Wire/Fibre Placement (with one stitch between)



4. Defined Double Wire/Fibre Placement (with two stitches between and defined distance)



Distance of wires/fibres depending on wire specifications: **1-5 mm** (wider spacing on special request)



CAESA® TFP SOFTWARE

1. CAD Software
- Construction of component geometry in your preferred 3D CAD software e.g. in SolidWorks

Export file format: .dxf, .stl

2. CAESA® TFP Software
- Automated creation of Lay Ups (based on layer thickness)
- Adjusts direction and spacing of fibers
- Exports layers or full parts as a line “ready for EPCwin”

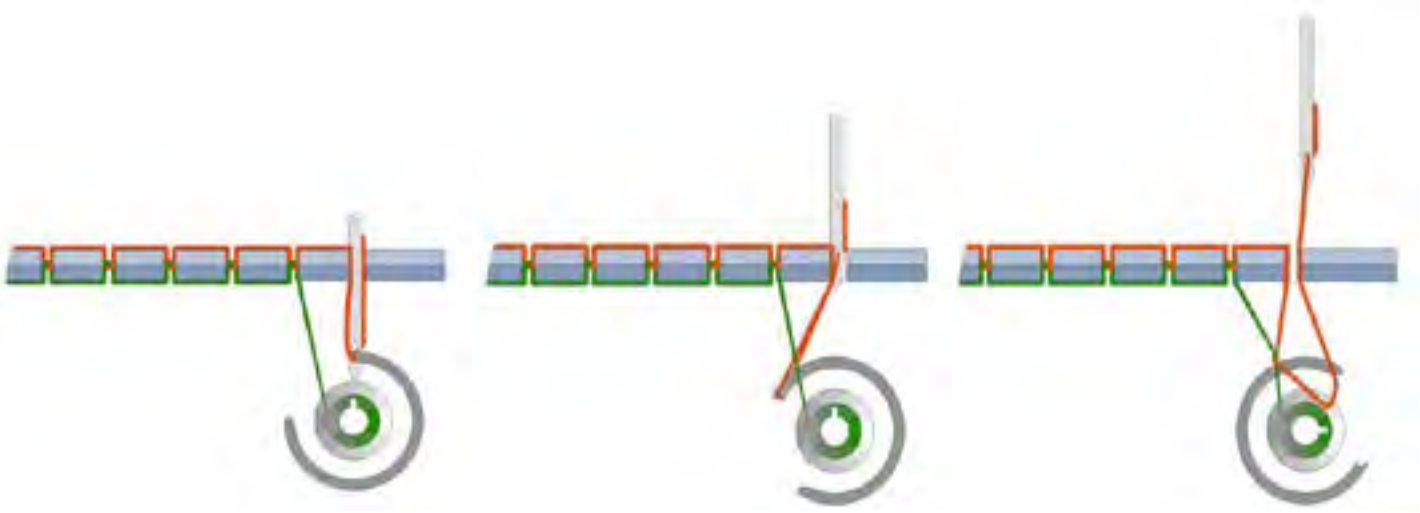
Export file format: .dxf

3. EPCwin Digitizing Software
- CAD software for adding parameters and stitch detail for embroidery machine file

Export file format: .z00

ZSK Embroidery Machine

STITCH FORMATION STANDARD EMBROIDERY



THREAD TENSION STANDARD EMBROIDERY

A. Bobbin thread tension:
For traditional embroidery, we recommend a 150/180 bobbin thread.
Recommended thread tension:
150 thread / 180 thread: 25-30 g.

For checking and adjusting the thread tension we offer two thread tension gauges:

Mechanical: **Art.No.: 570.632**
Electrical: **Art.No.: 570.800**

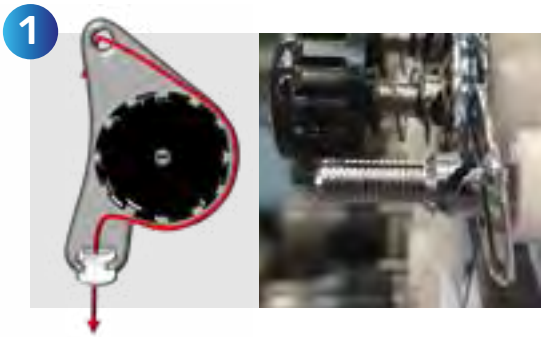
Hint:
The thread should not be taken out of the marked deflection point.

Hint:
If magnetic bobbins are used, the leaf spring must be removed from the bobbin cases.

B. Upper thread tension:

1

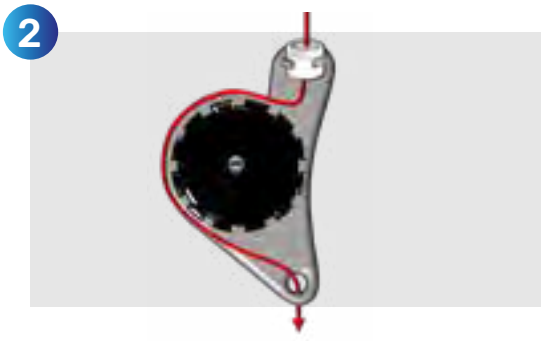
Upper thread tension: Thread run as shown.
Exception: 18-needle thread tensions.
Here, the thread will still be placed in the slot of the thread tension bolt.



The tension on the thread stand thread tensions should be just strong/high enough to calm the thread and loosen loops from metal yarns.

2

Middle thread tension - main tension:
Thread run as shown.
This is where the actual thread tension is set.



3

After the wheel of the bobbin thread monitor has been wrapped (clockwise), it goes past the guide pin on the left to the roller tensioner. Thread path as shown.

Rule of thumb:
10% of the thread tension at the thread stand (1)
70% at the middle thread tension (2)
20% at the roller tensioners (3)

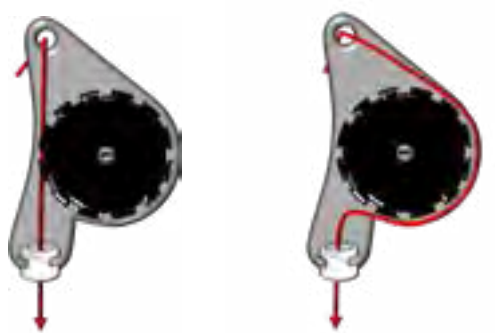
Even though it is the largest adjustment knob, the roller is not the main tension, but should be as soft/weak as possible.

Between the thread tensions on the thread stand and the thread tension units, there is another row of thread tensions on leather machines. past the thread tension using the guide eyelets.

4

This thread tension is not used for normal embroidery thread. The thread is simply guided past the thread tension using the guide eyelets.

This thread tension is used for extra thick threads (20's and thicker) to create 3D effects in leather and upholstery material.



The additional thread tension row is not part of the standard machine design.

C. Upper thread tension with One-Touch-System (OTS):

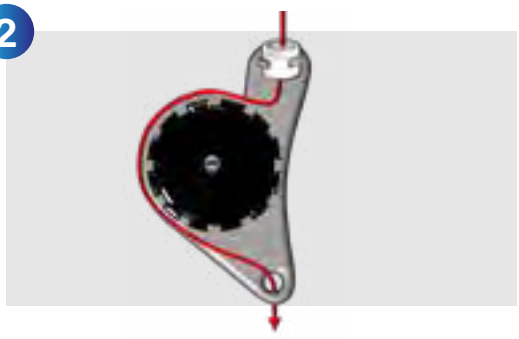
In the One-Touch-System thread tensioning, only the roller tension is used in daily operation. The modified roller tension can be easily identified by the **blue** ring. After adjusting the upper and middle thread tension once, these remain unchanged throughout the rest of the process.

1

1 2

Set Pre-Tension 1 and 2 in such a way that they generate approximately 60 - 70 cN thread tension.
For machines with only one adjustable Pre-Tension: Set the Pre-Tension so that it generates approx. 60 - 70 cN thread tension.

2



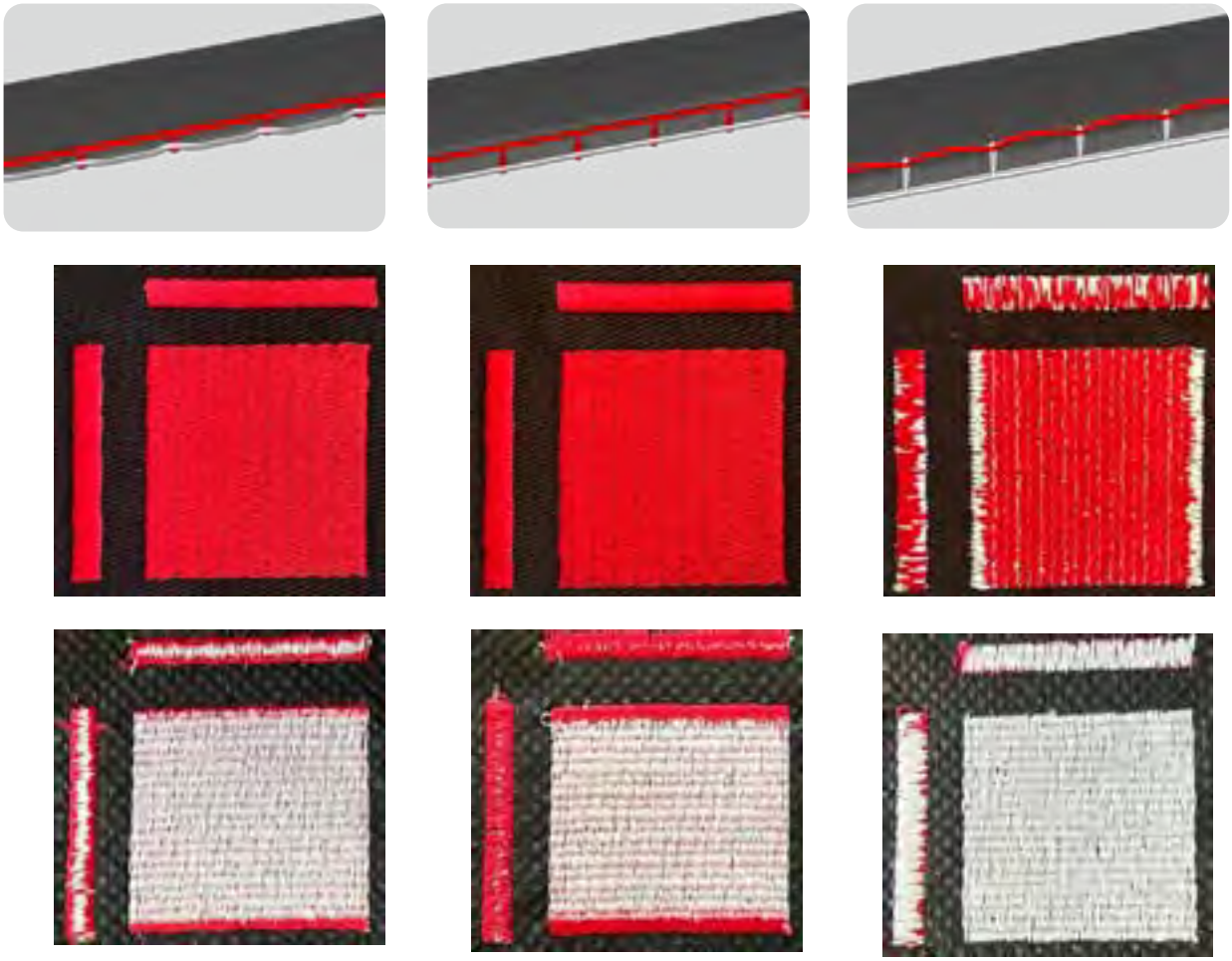
3

The exact thread tension will now only be adjusted using the roller tension.

3

Upper thread tension with One-Touch-System (OTS):

1. Open the roller tension completely so that no upper thread tension is generated at this point.
2. Set tension 1 and 2 in such a way that they generate approximately 20% … 30 % of the upper thread tension.
3. Adjust the desired thread tension with the roller tension.
4. **Test:** There must be no jerking when pulling off the upper thread. The thread tension must be very even.
5. From now on, the tensioners 1 and 2 must no longer be turned. The upper thread tension is only adjust using the roller tension. = One-Touch System (OTS)



Perfect

Bobbin thread too tight or upper thread too loose

Bobbin thread too loose or upper thread too tight

The thread tension is perfect when the material / embroidery base is not pulled together and you can see about 60% of the underthread in satin stitches.

THREAD TRIMMER ADJUSTMENT

Start stitches after trimming:
The default configuration is 3 stitches. The purpose of this function is to split any stitch longer than 3 mm among the specified number of stitches to enhance tacking performance.

Slow Start stitches:
Embroidery can be started with a defined number of slow stitches. Automatic slow speed during tacking. Some yarns require a low speed at the start of embroidery to achieve a better tacking result.

Disable thread sensing:
Deactivates the thread breakage sensor for a specified number of stitches.

Displacement after trimming:
To prevent the feeler arm from getting stuck during tacking when no pantograph movement follows thread cutting, a pantograph movement toward the pattern's center is performed. This is due to the design of the lower thread breakage sensor. Although these sensors are uncommon now, this setting can clear any leftover thread from the stitch hole before resuming embroidery.

Switch pantograph movement on/off:
When the current thread cutting system is in use, an automatic pantograph movement occurs during cutting. This movement happens when the hook knife is paused after capturing the upper thread. It presses the lower thread against the stitch hole, providing tension, which improves the hook knife's grip and enhances cutting safety.

IN-HOUSE PARTNER

3E Smart Solutions
Embroidery • Electronics • Engineering

3E Smart Solutions
Development partner for smart and e-textiles

- Flexible process allows joining and exiting at any stage.
- Support from idea generation to product launch.

- Workshops and Trainings:
  + electrical engineering
  + e-textiles development
  + embroidery machine operation

Idea Generation

Concept Development

Prototyping

Co-Development

In-House Small Batch Manufacturing

Large Scale Manufacturing

Quality Control

3E Smart Solutions
Magdeburger Str. 38-40
47800 Krefeld, Germany

Mail: info@3esmartsolutions.de
Web: www.3esmartsolutions.de

UNWIND3D

Unwind 3D
Development partner for thermoplastic composites.

- Setting new standards for the manufacturing of innovative, more sustainable and cost-effective products in the fields of heated textiles and composite products

- Technologies to produce small to medium size composites parts, from development to mass production.

- Know-how is the result of several years of research and industrial projects work while keep exploring, daily, for new thermoplastic materials; from fibres, prepregs to binding agents.

Discovery

Engineering / Consultancy

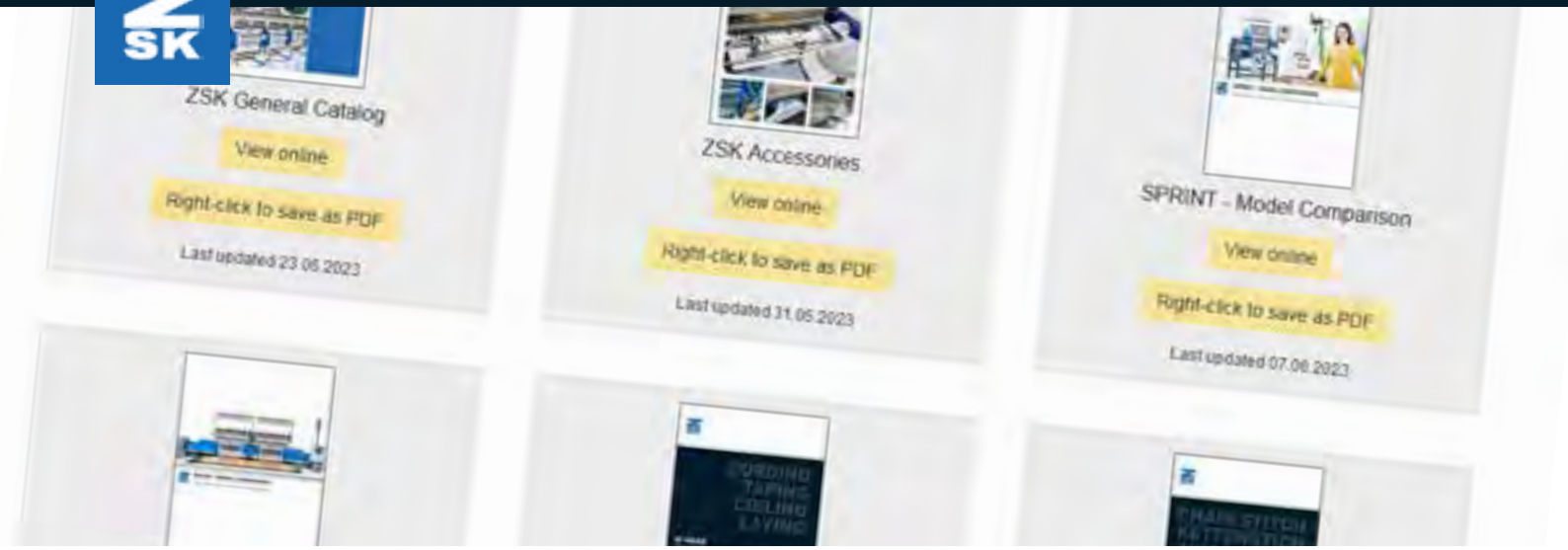
Product Development

Production

Continuous Support

Unwind 3D
Magdeburger Str. 38-40
47800 Krefeld, Germany

Mail: info@unwind3d.com
Web: www.unwind3d.com



WHERE TO FIND?

Catalogs
Catalog overview

Image Databank
Pictures; Embroidery designs

News & Innovations
Confluence; ILIAS

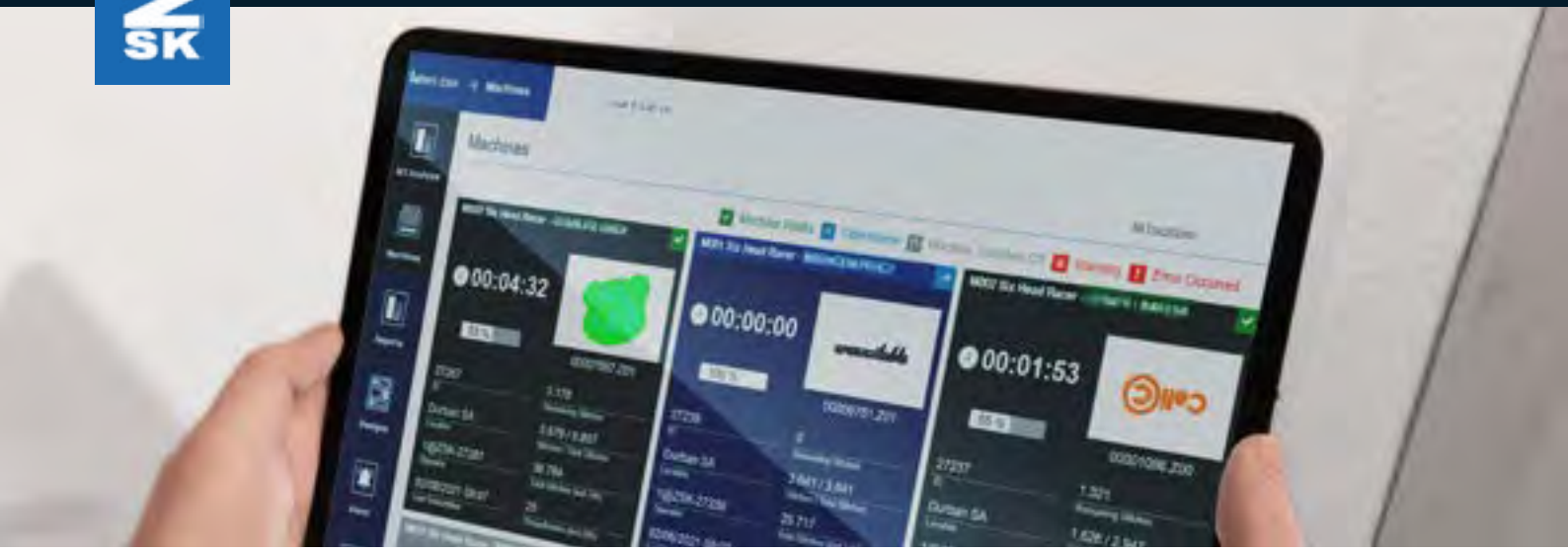
Online Shop
Order Parts online

How to?
Help at a glance

Downloads
Spare Part Catalogs; Manuals

Video Tutorials
ZSK Youtube Channel

Video Tutorials
Digitizing Acadamy



MY.ZSK

Cloud-Based License

- All production data (not stitch data) is transferred to the MY.ZSK cloud.
- Regular updates of the system.
- Annual maintenance fee for use of the system and data storage.
- Analysis tools can be accessed from mobile devices.

Local License

- Data remains within the local network and is stored on the server.
- No regular software updates. Updates can be customer specific.
- Data can be used by external analysis tools.

TERMINAL

Kickstart your embroidery production! ZSK Terminal Terminal

You are tired of translating stitch files for your embroidery machine? Save precious time for preparing embroidery files and get your ZSK machine up and running in no time.

Make the most of your machine park – ZSK Terminal Pro Terminal Pro

Get your embroidery jobs done with your zsk machine park more quickly and effectively, by reducing time in between the run time of your machines and treat your machines with some love with help of interactive maintenance.

Design Stock Terminal Terminal Pro

- Variety of embroidery designs ready to be sent to the machine.

Converter Terminal Terminal Pro

- Loading your own .DST files,
- Assigning colours to sections in .dst file.
- Provision of a .dst file corresponding to your colour assignment on the machine,
- Changing colours in existing .z00 file.

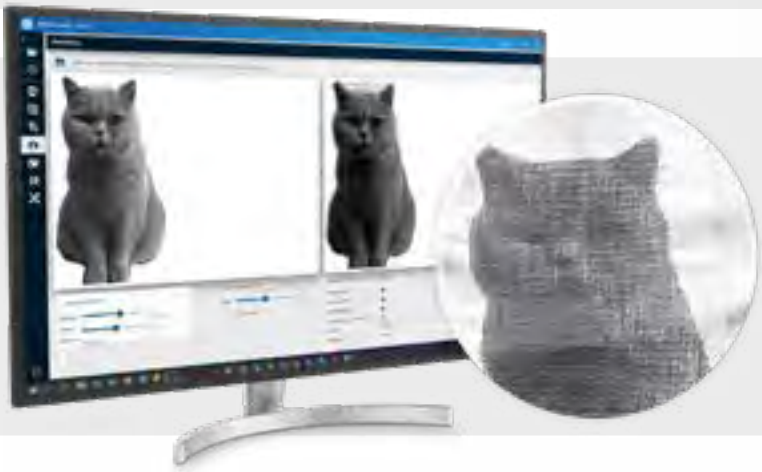


Photo Stitch Terminal Terminal Pro

- Converts your photos into stitch data.
- Works best with cropped objects.

Projects

Terminal Terminal Pro

- Management of projects,
- Files, descriptions and comments
- Generation of a thumbnail for the file.
- Displaying PDFs and images stored in projects in ZSK Terminal.

Easy Text

Terminal Terminal Pro

- Add text to embroidery file.
- Define size, font and colour.
- Save the edited file as a monogram template.

Maintenance

Terminal Pro

- loading your own .DST files,
- Assigning colours to sections in .dst file.
- Provision of a .dst file corresponding to your colour assignment on the machine,
- Changing colours in existing .z00 file.

Machine Matching

Terminal Pro

- Management of machines and orders.
- Processing file queue.
- Automatic thread cone matching.

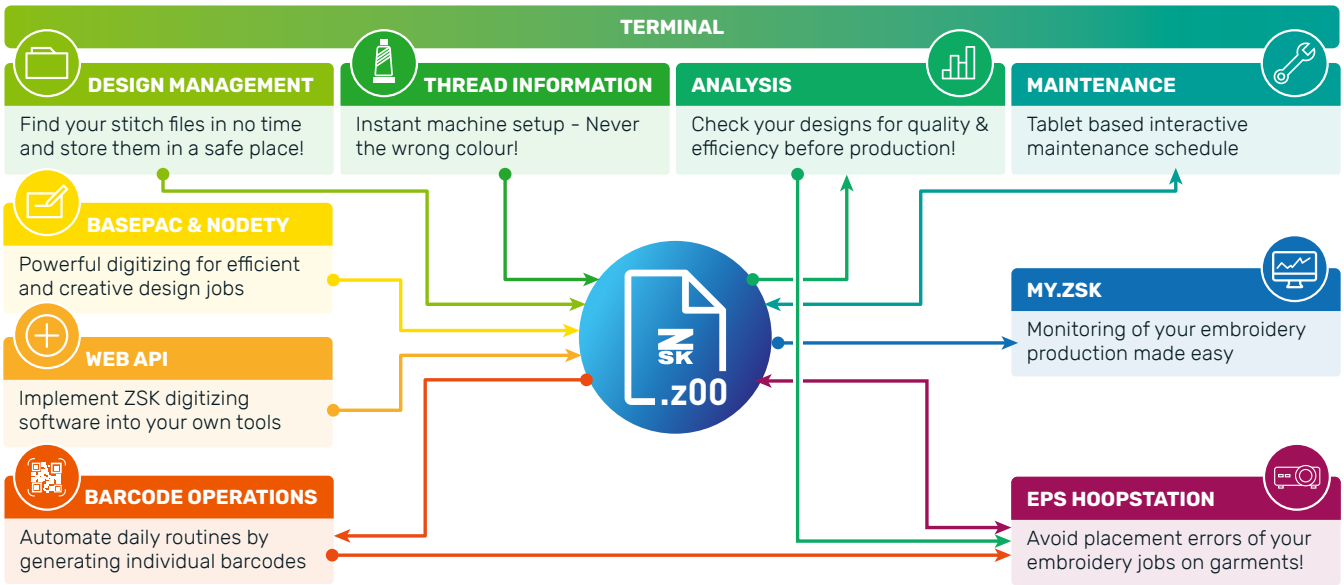
TRANSPORTCODE .Z00

The transport code (.Z00) is tailored for ZSK embroidery machines.

Machine-Specific Optimization:
The transport code includes detailed machine-specific instructions that maximize the performance of your ZSK machine. This ensures every stitch is executed with the precision and quality that ZSK is known for.

Advanced Stitching Techniques:
.Z00 files support unique ZSK commands for complex, refined designs that highlight your embroidery skills.

Enhanced Thread Management:
The transport code seamlessly integrates thread colour information, simplifying the setup process and ensuring the designs look exactly as intended.



Design Management:

- Quick design finding and secure storage.
- Transport code stores stitches, machine commands, and additional searchable information.
- 3D view in design colours available.
- Additional modules: Design Stock, EasyText and Converter

Thread Information:
- Instant machine setup with correct thread colours.
- Thread cones scanned via barcode before needle placement.
- .z00 file updates design colours to match machine setup automatically.

Analysis:
- Enhances embroidery workflow with precision.
- ZSK Transport Code stores design size, density, and stitch count.
- Analysis tool determines stitch density and provides accurate cost estimates.

Maintenance:
- Maintenance instructions displayed on a tablet via transport code.
- Easy recording of maintenance tasks.
- KPI status of design shown graphically for monitoring and quality assurance.

BasePac & Nodety:
- Powerful digitizing for creative and efficient embroidery designs.
- .z00 code includes precise machine commands and stitch sequences.
- Scanned embroidery results fed back into software for continuous improvement.

GiS API:
- API for integrating ZSK intelligence and digitizing quality into workflows and webshops.
- Tools for lettering and design preview using .z00 stitch files.

Barcode Operations:
- Quick and easy machine operations via barcode.
- Scanning designs, thread cones, frame recognition, and OPS II camera system parameter input.
- Reduced setup times and elimination of operating errors.

My.ZSK:
- Monitoring software and stitch codes created under one roof.
- Real-time production monitoring and analysis.
- MY.ZSK cloud-based or on-premise solution for improved production efficiency.

EPS HoopStation:
- Easy and accurate design positioning in hooping frame for all skill levels.
- Visual alignment to preset grid or custom guidelines.
- Positioning data saved with stitch data into transport code for hassle-free embroidery.

FIND THE CORRECT SOFTWARE

Who is your client?

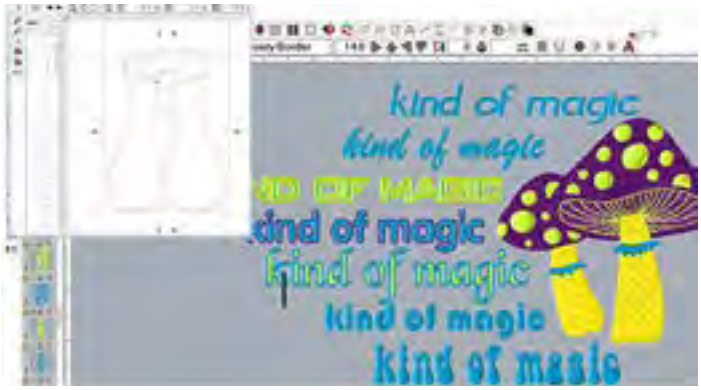
	Automotive		Technical Embroidery			Home Textiles		Garment		Marketing		
Company structure	Mass production	Customization Mid size companys	R&D/ Lab/ Universities	Mid size company / sampling / prototyping	Mass production	Middle size Company's / traditional Embroidery	Mass Production	Luxury Goods / traditional Embroidery	Mass production	Start-Ups / DIY	Workwear	Promotion
Time Money Quality Exp.	●●○○○ ●●○○○ ●●●○○ ●●●●○	●●●●● ●●●○○ ●●○○○ ●○○○○	●●○○○ ●●○○○ ●●○○○ ●●○○○	●●○○○ ●●○○○ ●●○○○ ●●○○○	●●○○○ ●●○○○ ●●○○○ ●●○○○	●●○○○ ●●○○○ ●●○○○ ●●○○○	●●○○○ ●●○○○ ●●○○○ ●●○○○	●●○○○ ●●○○○ ●●○○○ ●●●●○	●●○○○ ●●○○○ ●●○○○ ●●●●○	●●●○○ ●●○○○ ●●○○○ ●○○○○	●●●○○ ●●○○○ ●●○○○ ●●●●○	●●●○○ ●●○○○ ●●○○○ ●●●●○
Final Product	Interior, Headrests, Car seats, Dashboards, Car seats, ...	Individual customized products	Smart textiles, TFP, TTP, TWP	Smart textiles, TFP, TTP, TWP	Smart textiles, TFP, TTP, TWP	Curtains, pillowcases, Bedding, Tablecloth, ...	yardage goods	Haute Couture, Traditional costumes	Fashion & garment manufacturer	Ready made garments, Accessories	Ready made garments, patches, Accessories	Ready made garments, patches, Accessories

What do they need?

Profile	Mass Prod.	Customization	R&D	Sampling	Mass Prod.	Middle Size	Mass Prod.	Luxury & Trad. Emb.	Mass Prod.	Start-ups & DIY	Workwear	Promotion
Software	EPCwin	EPCwin	EPCwin	EPCwin	EPCwin	BasePac Base or Premium	BasePac Premium Or Professional	BasePac Professional	BasePac Premium	BasePac Base	BasePac Base	BasePac Professional
Additional Software	Terminal	Terminal Pro	-	-	Terminal Pro	Terminal	Terminal Pro	EPCwin	Terminal Pro	Terminal	Terminal Pro	Terminal
Training	5 days Face2Face	5 days Face2Face	5 days Face2Face	5 days Face2Face	5 days Face2Face + Online Training	Youtube + Online Training	Youtube + Online Training or Face2Face	3-5 days Face2Face	3-5 days Face2Face + Online community	Youtube + Online Training + Online community	Youtube + Online Training + Online community	Youtube + Online Training + Online community
Buying Trigger	Quality, „we make it possible", Full solution	Quality, „we make it possible"	„We make it possible" Full solution	Flexibility, Full solution	Full solution	Connectivity Efficiency	Full solution	Quality, Full solution	Price, Efficiency, Full solution	Price, Flexibility	Efficiency,	Quality, Flexibility

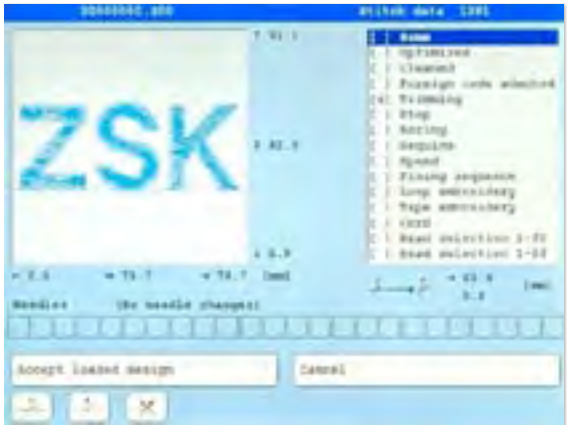
MONOGRAM FUNCTION

Monogram functions are available in EPCwin, BasePac, ZSK Terminal and in basic directly in the T8 controller. Thus it integrates ideally into your workflow.



Embroider monograms or add monograms to logos or other embroidery designs.

Use any of the 100 pre-installed fonts, convert any True Type font from your PC/Mac, edit existing fonts, or even create your own fonts freehand or based on an image.



SAFETY FEATURES

- Our machines are already set up to meet high safety standards and comply with legal requirements.
- We also offer optional equipment that allows you to tailor the safety of your system to your in-house needs.
- For individual solutions, please contact your personal contact from our company. We gladly implement special solutions according to your conditions.

Standard features

- Additional emergency stop
- Status light (R-Series)
- Protectors for thread take-up lever
- Simple operation mode (T8)

Optional feature

- Light barrier
- Light curtain
- Key lock system **Art.No.: 396.200.052**
- Status light
- **My.ZSK** status indicator
- Protective cover
  18 Needle Head 1: **Art.No.: 285.003.920**
  18 Needle Head 2: **Art.No.: 285.003.917**
  24 Needle Head 1: **Art.No.: 281.998.901**
  24 Needle Head 2: **Art.No.: 281.998.900**
- Hook protection JAFA **Art.No.: 360.002.944**

Protective hoods:
Responsible for the Design of a safe machine is the manufacturer.
Responsible for the safe use of a machine is the operator.

According to our responsibility and the CE guidelines, protective hoods cannot be removable without tools.

Pos Pos		Bezeichnung Description	Nr. No.	Nr. 2 No.2
001		Zyl-Schraube M4 x 6 DIN 912	Z-000-0134	307 009
002		Scheibe B 4,3 DIN 125	Z-000-0355	380 016
Ⓐ		Bändchenfuß kpl. / Tape foot complete		
003		Bändchenfuß kpl. B = 1,5 mm	Z-002-3589	310 023 949
003		Bändchenfuß kpl. B = 2,0 mm	Z-002-3570	310 023 920
003	●	Bändchenfuß kpl. B = 2,5 mm	Z-002-3571	310 023 921
003		Bändchenfuß kpl. B = 3,0 mm	Z-002-3572	310 023 922
003		Bändchenfuß kpl. B = 3,5 mm	Z-002-3573	310 023 923
003	●	Bändchenfuß kpl. B = 4,0 mm	Z-002-3574	310 023 924
003		Bändchenfuß kpl. B = 4,5 mm	Z-002-3575	310 023 925
003		Bändchenfuß kpl. B = 5,0 mm	Z-002-3576	310 023 926
003		Bändchenfuß kpl. B = 5,5 mm	Z-002-3577	310 023 927
003		Bändchenfuß kpl. B = 6,0 mm	Z-002-3578	310 023 928
003		Bändchenfuß kpl. B = 7,0 mm	Z-002-3579	310 023 930
003		Bändchenfuß kpl. B = 8,0 mm	Z-002-3580	310 023 932
003		Bändchenfuß kpl. B = 9,0 mm	Z-002-3581	310 023 934
003		Bändchenfuß kpl. B = 10,0 mm	Z-002-3582	310 023 936
003		Bändchenfuß kpl. B = 11,0 mm	Z-002-3583	310 023 938
003		Bändchenfuß kpl. B = 12,0 mm	Z-002-3584	310 023 940
003		Bändchenfuß kpl. B = 13,0 mm	Z-002-3585	310 023 942
003		Bändchenfuß kpl. B = 14,0 mm	Z-002-3586	310 023 944
003		Bändchenfuß kpl. B = 15,0 mm	Z-002-3587	310 023 946
003		Bändchenfuß kpl. B = 16,0 mm	Z-002-3588	310 023 948
Ⓑ		Bändchenfuß / Tape foot		
004		Bändchenfuß B = 1,5 mm	Z-003-1721	990 121 209
004		Bändchenfuß B = 2,0 mm	Z-003-1712	990 121 200
004		Bändchenfuß B = 2,5 mm	Z-003-1713	990 121 201
004		Bändchenfuß B = 3,0 mm	Z-003-1714	990 121 202
004		Bändchenfuß B = 3,5 mm	Z-003-1715	990 121 203
004		Bändchenfuß B = 4,0 mm	Z-003-1716	990 121 204
004		Bändchenfuß B = 4,5 mm	Z-003-1717	990 121 205
004		Bändchenfuß B = 5,0 mm	Z-003-1718	990 121 206
004		Bändchenfuß B = 5,5 mm	Z-003-1719	990 121 207
004		Bändchenfuß B = 6,0 mm	Z-003-1720	990 121 208
004		Bändchenfuß B = 7,0 mm	Z-003-1722	990 122 201
004		Bändchenfuß B = 8,0 mm	Z-003-1723	990 122 203
004		Bändchenfuß B = 9,0 mm	Z-003-1724	990 122 205
004		Bändchenfuß B = 10,0 mm	Z-003-1725	990 122 207
004		Bändchenfuß B = 11,0 mm	Z-003-1726	990 122 209
004		Bändchenfuß B = 12,0 mm	Z-003-1727	990 122 211
004		Bändchenfuß B = 13,0 mm	Z-003-1728	990 122 213
004		Bändchenfuß B = 14,0 mm	Z-003-1729	990 122 215
004		Bändchenfuß B = 15,0 mm	Z-003-1730	990 122 217
004		Bändchenfuß B = 16,0 mm	Z-003-1731	990 122 219
005		Blattfeder B = 1,5-6,0 mm	Z-000-5430	310 023 220
005		Blattfeder B = 7,0-16,0 mm	Z-000-5432	310 023 222
006		Scheibe B 3,2 DIN 125	Z-000-0352	380 012
007		Linsenschraube M3 x 4 DIN 7985	Z-000-0188	336 025
008	●	Stoffdrückerfuß kpl. Wickel	Z-002-3563	310 023 804
009	●	Stoffdrückerfuß Zick-Zack	Z-000-5451	310 024 223
Ⓒ	●	Seitenstichadapter kpl. / Sideways stitch adapter complete	Z-002-3568	310 023 905
010		Zyl-Schraube M3 x 8 DIN 912	Z-000-0130	307 003
011		Scheibe A 3,2 DIN 9021	Z-000-0353	380 013
012		Schieber	Z-000-5438	310 023 231
013		Zyl-Schraube M4 x 16 DIN 7984	Z-000-5255	308 006
014		O-Ring 3,00-1,00 72 NBR 872	Z-000-0461	510 092
015		Führung	Z-000-5437	310 023 230

● scope of delivery - For technical machines, the scope of delivery is adapted to the list of requirements.

Pos Pos	Bezeichnung Description	Nr. No.	Nr. 2 No.2
Ⓓ ●	Raffbändchenvorrichtung kpl. / Frilling device complete	Z-002-3569	310 023 906
016	Linsenschraube M3 x 6 ISO 7380-1	Z-000-5208	306 202
017	Blattfeder	Z-000-5436	310 023 229
018	Blattfeder B=6,0	310023228	310 023 228
019	6kt-Mutter M3 ISO 4032	392013	392 013
Ⓔ	Zick-Zack-Fuß / Carbon / Zigzag foot / Carbon		
020	Fuß 2x25K-Zick/Zack-Carbon	Z-008-6080	310 031 280
021	Fuß 12K-Zick/Zack-Carbon	Z-008-4460	310 031 276
021	Fuß 24K-Zick/Zack-Carbon	Z-008-4461	310 031 277
021	Fuß 48K-Zick/Zack-Carbon	Z-008-4462	310 031 278
022	Hebel-Schwenkplatte	Z-004-0163	310 024 247
023	Klemmstück	Z-000-5660	310 999 515
024	Zyl-Schraube M3 x 8 DIN 912	Z-000-0130	307 003
Ⓕ	Zick-Zack-Fuß / Standard / Zigzag foot / Standard		
025	Fuß kpl. Ø 3,0 mm Paillette	Z-002-3603	310 024 807
026	Fuß kpl. Ø 1,5 mm Zick-Zack	Z-003-2127	310 024 805
026 ●	Fuß kpl. Ø 2,0 mm Zick-Zack	Z-002-3605	310 024 809
026	Fuß kpl. Ø 2,5 mm Zick-Zack	Z-002-3600	310 024 803
026 ●	Fuß kpl. Ø 3,0 mm Zick-Zack	Z-002-3602	310 024 806
026	Fuß kpl. Ø 3,5 mm Zick-Zack	Z-002-3601	310 024 804
026	Fuß kpl. Ø 4,2 mm Zick-Zack	Z-002-3604	310 024 808
026	Fuß kpl. Ø 5,0 mm Zick-Zack	Z-002-3606	310 024 810
026	Fuß kpl. Ø 6,0 mm Zick-Zack	Z-002-3607	310 024 811

● scope of delivery - For technical machines, the scope of delivery is adapted to the list of requirements.

TFP laying speed / standard / fast laying / HV-TFP / HV-TFP + fast laying

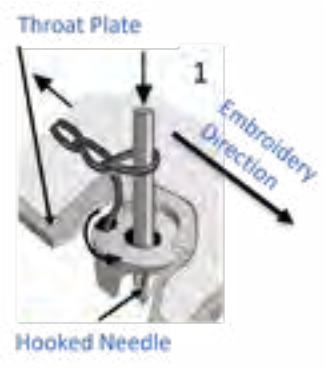
Machine type:	MW 0200-550-700	
Fiber brand / type	Toray T620SC-2400-60E	
Fiber size - filaments	24K	
Fiber weight g/m [tex	1,85	1.850
Design size / shape	500 x 500mm square	

fiber orientation	stitch length mm	pantograph stroke	Zig-Zag layer stroke	laying width mm	fully stitched	fast laying	HV-TFP	HV-TFP + fast laying	no of stitches	averag. Speed stitch/min.	running time minutes	laid meters of fiber	meters per hour	grammes per hour
0° / 90°	6,0	100	80	6-9	yes	no	no	no	7.748	600	12,91	42,30	197,2	365
0° / 90°	6,0	100	80	6-13	no	yes	no	no	4.573	500	9,09	41,80	411,8	762
0° / 90°	6,0	150	100	11-13	no	no	Yes	no	4.177	350	5,56	42,60	460,5	852
0° / 90°	6,0	150	100	11-15	no	no	no	yes	2.677	500	5,30	42,60	774,5	1.433
+/- 45°	6,0	100	80	6-8	yes	no	no	no	8.018	550	14,50	42,10	176,6	327
+/- 45°	6,0	100	80	6-13	no	yes	no	no	4.240	500	8,63	42,00	380,7	704
+/- 45°	6,0	150	100	11-13	no	no	Yes	no	4.413	450	9,45	42,80	354,4	730
+/- 45°	6,0	150	100	11-15	no	no	no	yes	2.528	500	5,41	42,80	737,6	1.364

K-HEAD - PARAMETER

Chain stitch

Thread loops are pulled through backing material. By inserting the needle into the previously formed loop, the loops are joined to create a continuous chain of interlaced stitches. The hook of the needle is facing towards the embroidery direction.



Most important parameters - Chain stitch:

1. Stitch length and needle height
2. Presser foot height
3. Thread tension

1. Stitch length and needle height

The stitch length influences the height of the formed loops and the length of the chain links. Since the loops are laid flat, the needle height and stitch length need to be coordinated with each other.
A stitch length that is too wide results in con-striction. In the opposite case, the formed stitch is irregular and compressed.


Stitch lenght: 15


Stitch lenght: 30

2. Presser foot height

The formation of the chain stitch is also dependent on the presser foot height. This factor also influences the width of the chain stitch. A higher presser foot setting will result in the loop being less clamped and, therefore, pulled tighter.


Presser foot height: 3


Presser foot height: 9

3. Thread tension

As a third parameter, thread tension also plays a role in determining the width. It should be chosen appropriately for the used material.


Thread tension: 50 gf


Thread tension: 200 gf

Moss stitch

Moss embroidery uses a single-thread system to create a dense, moss-like surface by pulling thread loops through the backing material.
The hook of the needle is facing contrary to the embroidery direction.

Most important parameters - Moss stitch:

1. Stitch length
2. Needle height
3. Presser foot height
4. Thread tension

1. Stitch length

Opt for a shorter stitch length to increase pattern density and prevent loops from being pulled out during the pantograph stroke.

2. Needle height

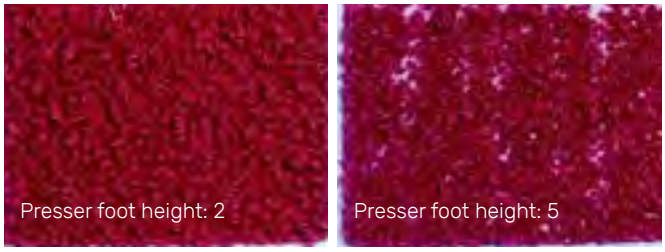
The needle height defines the height of the formed loops. A higher value results in a higher pile.

Variable moss height

With our EPCwin punch software, the needle height can be adjusted even within a single colour.

3. Presser foot height

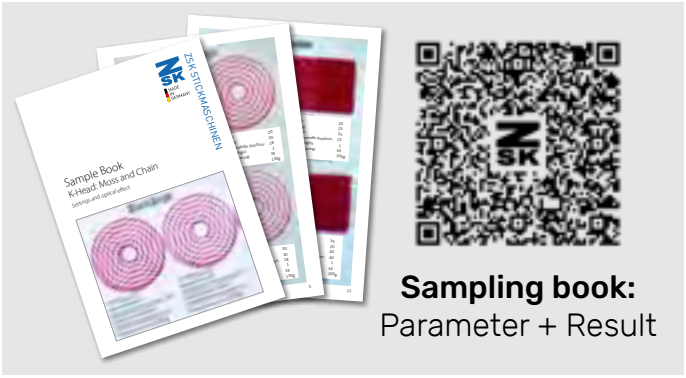
The presser foot height is crucial for proper loop formation. Insufficient clamping of the thread from the previous loop can cause the current loop to draw its thread from the previous one, resulting in a smaller or disappearing loop.



Setting: „0“ = Presser just touches down on the stitch plate (without fabric).

4. Thread tension

As a fourth parameter, thread tension also plays a role in determining the height. It should be chosen appropriately for the used material.

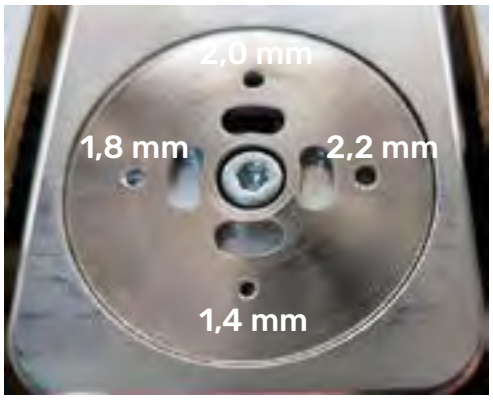


Sampling book:
Parameter + Result

K-HEAD - THREAD, NEEDLE, FABRIC PRESSER INSERTS

When embroidering with the K-head, it's advisable to use threads with a high coefficient of friction, such as wool or polyester threads. To match the thread thickness being used, an appropriate combination of needle, fabric presser, and stitch hole should be selected.

The needle plate has four stitch holes with diameters of 1.4, 1.8, 2.0, and 2.2 mm. Depending on the needle size and the thread thickness being used, an appropriate stitch hole should be selected.



Fabric presser insert	Needle size
0,8 mm	70, 80
1,0 mm	90, 100
1,2 mm	110, 120

Art.No.: 301.989.203

Fabric presser inserts

Fabric presser insert 0,8	**Art.No.: 302.998.212**
Fabric presser insert 1,0	**Art.No.: 302.998.208**
Fabric presser insert 1,2	**Art.No.: 302.998.213**

Crochet hook

Crochet hook CE X 3 / NM 70	**Art.No.: 574.250**
Crochet hook CE X 3 / NM 80	**Art.No.: 574.251**
Crochet hook CE X 3 / NM 90	**Art.No.: 574.252**
Crochet hook CE X 3 / NM 100	**Art.No.: 574.253**
Crochet hook CE X 3 / NM 110	**Art.No.: 574.254**
Crochet hook CE X 3 / NM 120	**Art.No.: 574.255**

Polishing cord

Polishing cord No. 52	**Art.No.: 680.188**

Order of embroidery heads and needles

The order of embroidery heads still originates from Jacquard machines. In these machines, the embroidery heads were counted starting from the Jacquard control, which was consistently located at the back right of the machine.. This system was subsequently adopted for the order of the needles as well.

X-axis and Y-axis of the coordinate system

Why are the X and Y axes swapped in ZSK, contrary to the international system?

What is certain is that this switch occurred during the development of the first electronically controlled machine.

One explanation for the swapped axes is based on the arrangement similar to that of a Jacquard machine. The operator stands on the right side at the front and looks at the heads and needles, with the first head/needle numbered as 1. When defining the X-axis to the right/left and the Y-axis to the front/back from this position, it results in the axes being swapped compared to today's conventions.

On the right is an image of a PA1 control. This was the first electronic control used on a ZANGS embroidery machine. These controls were developed and built by Fortron. The PA1 control could only read the ZANGS/Marco punched tape code and its only extra feature was the ability to rotate and mirror the pattern in 90-degree increments.

Thread break behavior

Selective embroidery on or off.

For multi-head machines, selective stitching should generally be turned on because in this mode, only the head that has reported thread breakage performs the repair stitches. The other heads then re-engage according to the value set for the end of selective stitching before reaching the thread break point.

For single-head machines, you can actually disable this function. When stitching back with a single-head machine, you want to continue with that specific head.

Needle-specific upper and lower thread sensors

Furthermore, in this dialog window, you can also enable or disable the upper and lower thread sensors, or specify them for each needle. This is not only intended for the jump stitch test.

The main reason for deactivating the thread sensor is that instead of embroidery needles, cutting blades can be used to cut out large holes, and then the edges are stitched around. Four of these cutting blades are used for each head, each oriented in four different directions.

1 = Vertical cuts / 2 = Horizontal cuts / 3 = Diagonal cuts from left to right / 4 = Diagonal cuts from right to left.

The advantage of this system is that larger holes can be created compared to using a drilling setup, as the material is cut out rather than just slit. The drawback is that after cutting a hole, the cut material needs to be removed.

(Michael Hecker)

When setting the needle-specific lower thread sensors, there is also the option to adjust them proportionally. This reduces the sensitivity of the lower thread sensor for the respective needle.

Background: This is due to the rigidity of inexpensive Chinese metallic threads, which do not properly wrap around the spools of the lower thread sensors and therefore do not rotate as they should. This constantly leads to false thread break alarms, significantly affecting production. Some threads circulating in the market require reducing the sensitivity of the lower thread sensors to as low as 35%.

(Michael Hecker)

Axis correction

The axis correction is a function designed to align two or more machines based on the embroidery pattern. Since the function of axis correction is largely self-explanatory, it is worth noting here:

When axis correction is activated, the machine or step stitch optimization is also automatically enabled, even if it is turned off in the menu.

Even though the values can be adjusted here up to 10 increments, it's generally not recommended to do so. If more than 3 increments in either the plus (+) or minus (-) direction are required for correction, the pantograph should be mechanically examined. If positive values are needed, it's likely that the timing belts are too weak. If negative values are required, the belts are probably too tight, often due to belt and timing belt wheel contamination.

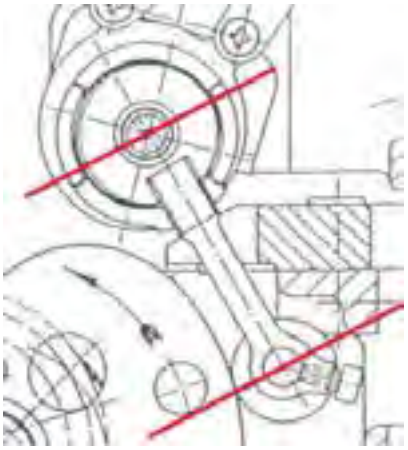
Cam disc P1, P11, P3

Overall, we find three different cam discs in the purple machine series.

P1 cam disc

- The P1 cam disc, initially used in the first Purple machines (MSC-A), was consistently mounted with the lever eyelet at the back (1), except for early prototypes.
- Cam settings for Non-F-Heads on flatbed machines were 70° (with grippers having a long counterpoint), and for free-arm machines, settings ranged from 68° to 72° (with grippers having a short counterpoint/forced thread cutter).
- Machines with the lever eyelet at the front (2) had initial cam settings at 70° but were later switched to the lever eyelet at the back due to issues with thread control.

- The P1 cam was always installed with the "long bone," maximizing the distance between the rotation axes for precise movement.
- A later variant, the P1 cam disc, continued to be used in Purple machines with the F-Head.
- Two variants, known as curtain and India machines, had settings at 142° in the F-head, with a gripper featuring a short counterpoint.



- The India variant used S-threads due to local standards at the time, while the curtain variant employed S-threads partially, along with different tensions and tension devices.
- Today, P1 cams are exclusively installed in the W-Head, equipped with a "short bone" to maximize thread delivery from the W-Head system.

P11 cam disc

- The P11 cam disc replaced the P1 cam disc in the early variants of the Purple machines with MSC-A controls.
- In the embroidery head generation preceding the F-Heads, the cam discs were set at 64°. This applied to both flatbed and free-arm machines.
- For the F-Heads, the cam is set at 136°, for both flatbed and free-arm machines. The thread guide bone is set to "long" for machines with the embroidery head generation preceding the F-Heads and "short" for F-Head machines, with the exception of the first delivered F-Head machines.
- The P11 cam disc was almost always installed with the lever eyelet at the front, with one exception.

- Due to the P11 cam disc in MSC-A controlled machines, a skin wave brake had to be installed. The shorter upper dead center of the cam discs could lead to uncontrolled half-turn movements forward or backward when the machine was stopped without braking.
- With the introduction of the F head, the P11 cam disc was initially installed with lever eyelets at the back. Settings included a loop stroke of 2.5 mm and a needle depth of 1.5 mm. This adjustment was made to enhance the appearance of small fonts, which were expected to look better with reduced thread delivery. However, this reduced thread delivery caused fabric distortion issues in embroidery, especially with large patterns and contours.

- Embroidery trials were initiated, leading to a return to the lever with the eyelet at the front. This adjustment resulted in an additional 6 mm of thread per stitch.
- Subsequently, the cam rollers (short bone) were rotated, providing an extra 3 mm of thread per stitch.
- With further modifications to the faceplates during the introduction of separators, the length and shape of the noses were altered, yielding approximately 3 mm more thread per stitch.

Die P3-cam disc

- The P3 cam disc is distinguished by a texture (marked in red) to differentiate it from other cams.
- The P1 and P11 cam discs are not marked; in this case, the more rounded curve corresponds to the P1, while the P11 is narrower than the P3 and significantly slimmer than the P1.
- The P3 cam disc was developed before the P11 but was never used in machines predating the F head. It was installed in flatbed machines around the years 2009-2010. Its purpose was to improve the distribution of the bobbin thread in embroidery.

- P3 cam curves caused frequent thread breakage in stitches under 3 mm length.
- Initially set at 129°, later adjusted to 126° for a smoother thread pull during retraction.
- Flatbed machines reverted to P11 cam disc due to thread breakage issues.
- P3 was never used in J machines due to significant thread breakages.
- Sprint 5 machines used P3 until Sprint 6 reverted to P11 for a consistent pattern.

- As of late 2021, all machines use P11 cam disc at 136° (except W heads).
- Parameters for P11: 2.5 mm loop stroke, 1 mm needle depth, hard fabric presser springs for RACER and SPRINT; 2 mm loop stroke, 1 mm needle depth for flatbed

As of late 2021, two exceptions exist:

a.) Machines for Pakistan, Saudi Arabia, and the United Arab Emirates have P11 cam discs set at 133° due to lower-quality threads, mainly from China.

b.) Sprint 8 machines have the standard setting of 136° but feature a longer thread guide lever. To prevent excessive thread delivery, the bone is rotated back to "long," designed for stitching Puffy designs up to 7 mm thickness and improving overall embroidery patterns.

Settings of the pantograph

Fundamentally, we differentiate between silk stitch and non-silk stitch pantographs.

Non-silk stitch pantograph

We find this in all ZANGS machines, the old ZSK machines (Brown Generation), up to the series of the Purple MSC-I-controlled machines with the predecessor of the F-head (no fabric pusher intercepted by drive).

Brown Generation 174/8

Purple Generation X 1209-495
F-Head predecessor

a. In the Non-Silk Stitch Pantograph, the pantograph's movement starts shortly after the needle exits the embroidery material, without utilizing the dead time – the time from triggering the start impulse to the machine's mechanical movement.

b. The pantograph always starts at a programmable degree angle in the machine's control, with the thread sensor lever consistently positioned. This ensures a consistent amount of thread for all stitches, so a 0.1 mm stitch receives the same thread as a 12.7 mm x 12.7 mm diagonal stitch.

c. Short stitches may be too loose, while long stitches tend to be too tight. Additionally:

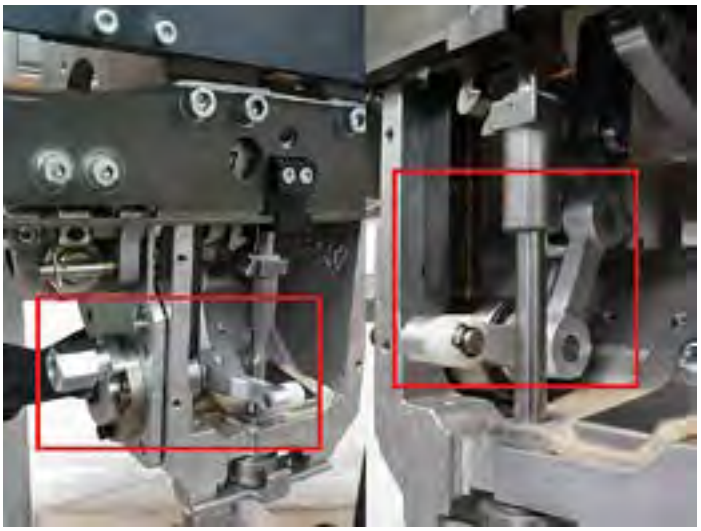
The later the PA (Pantograph) start, the higher the thread sensor lever is positioned (less thread slack), resulting in a tighter stitch.

The Non-Silk Stitch Pantograph is inferior to the subsequent silk-stitch system. Nevertheless, it still has its purpose.

Silk stitch pantograph

This system was introduced with the so-called F-Head (Intercepted/Driven Fabric Presser) and differs in two aspects from the Non-Silk Stitch Pantograph.

about
15%
increase in production



Silk-stitch ramps consistently utilize dead time by advancing the pantograph start command, incorporating the 8-millisecond reaction time of electronics and mechanics. This leads to an average production increase of around 15% compared to non-silk ramps.

a. The pantograph's start time is set using a degree value in the control's service area, but it's just an average. In the silk-stitch ramp, the pantograph starts based on stitch length, ensuring all stitches are completed just before the needle re-enters the material. For long stitches, the thread sensor lever is lower than for short, later-starting stitches, ensuring more uniform thread tension by considering the thread requirement for the pantograph's travel distance and the provided amount of thread.

In general the silk-stitch system produces better embroidery quality.

Exceptions from the silk-stitch pantograph

Current T8 terminals allow disabling the silk-stitch option in pantograph settings. This results in behavior similar to the non-silk stitch pantograph. However, non-silk stitch ramps are also utilized today, making use of dead time.

Puffy or 3D embroidery

Puffy heights of 3-4mm are easily handled in flatbed or cap operation with the regular silk-stitch ramp. However, challenges arise with puffiness of 4-8mm. The silk-stitch ramp stops too late, and the needle re-enters the material before the pantograph halts.

Conversely, the non-silk stitch ramp starts too early, with the needle still in the material when the pantograph begins moving.

Recommended settings:

- **Silk stitch: off**
- **PA-Start: 280 deg (Needle is out of the embroidery material)**
- **Reduce the speed to 650-700 RPM (pantograph stops before the needle re-enters the embroidery material).**

Tuf, Tuftuf or Tuft embroidery

This refers to the embroidery style known as Tuft, Tuftuf, or Tuft, where multiple layers of puffy material are embroidered in flatbed operation. The thread is later cut at the top edge of the puffy material after the back is fused with an adhesive backing.

Recommended settings:
- **Silk stitch: off**
- **PA-Start: 280 deg (Needle is out of the embroidery material)**
- **Reduce the speed to 650-700 RPM (pantograph stops before the needle re-enters the embroidery material).**

Symbols/Logos

For example: Hugo Boss, Adidas, Puma, Lacoste, Jack Wolfskin etc.

Here, you can also try turning off the silk stitch. Since these patterns primarily consist of small stitches, you can attempt to embroider with the following parameters:

- Silk stitch: off
- PA-Start: 255 deg
- Speed: 750 RPM
- 60 or 65 size needles with RG or SES point

Due to the early pantograph start, the thread sensor lever is still positioned low. This results in a softer stitch. The reduced speed allows the entire system more time to stabilize, resulting in less abrupt thread withdrawal.

Leather embroidery

At this point, regular embroidery on leather is meant, not specifically on car seats. In the past, it has been observed that many patterns on leather perform better (with fewer thread breaks) when the silk stitch is disabled, and an early pantograph start is utilized.

Embroidering with thick threads

For example: Automotive/Upholstery Industry

In general, the principle here is to have the silk stitch on and the latest possible pantograph start.

Keeping the silk stitch on and starting the pantograph as late as possible raises the thread sensor lever, laying the thread tightly for a cutting effect or smooth application. Bentley/Boxmark Croatia enhanced this by utilizing the percentage speed limitation of the silk-stitch ramp.

Reducing the speed by up to 30% (70%-100%) allows for a later pantograph start, positioning the thread sensor lever higher for a taut thread. This setting is in the basic speed menu for the entire machine when the silk-stitch ramp is active.

This setting is also available in the needle-specific speed adjustments because we only want this option for thick sewing thread, not for regular embroidery thread.

origin of the percentage speed limitation

The percentage speed limitation originated in the early 1990s to address loop formation with early polyester threads. It's no longer needed in regular embroidery due to improved thread quality. Reactivated for combined embroidery and sewing threads, it's needle-specific in later software versions.

Constant speed

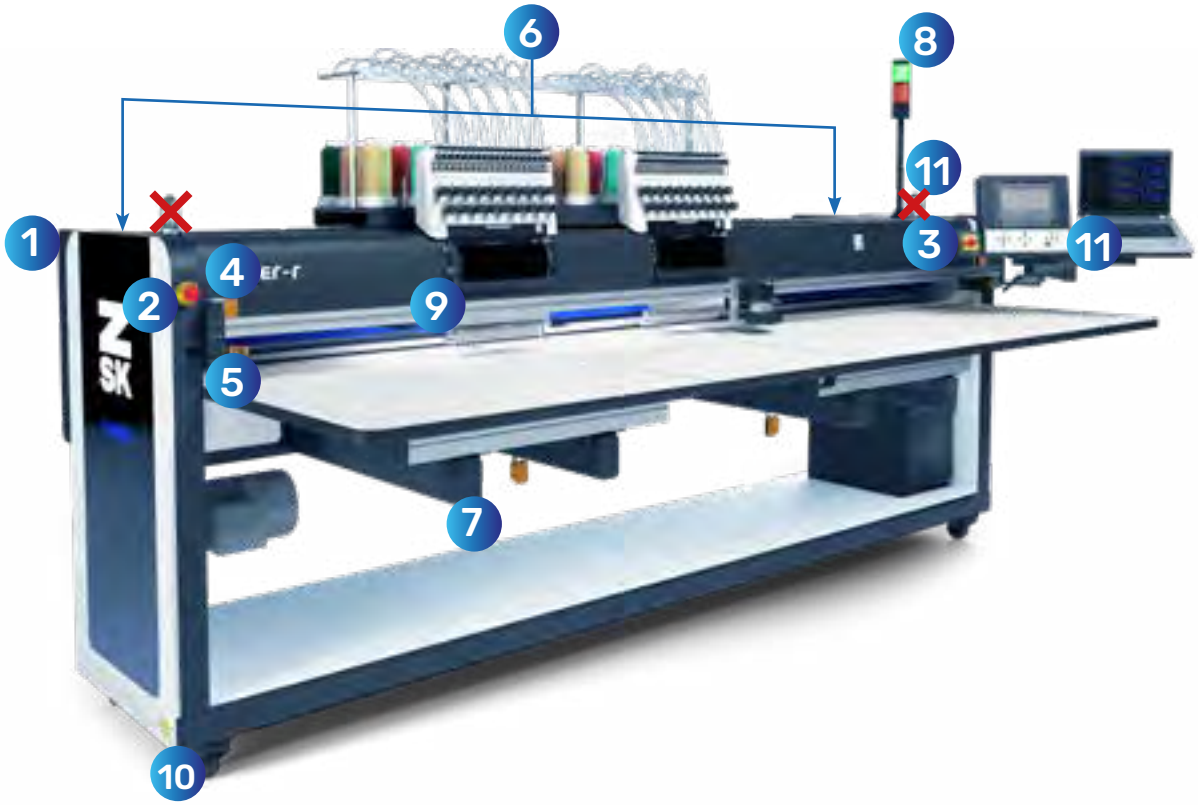
The constant speed is part of the pantograph settings as it influences the behavior of the pantograph. Background: The constant speed is an option for customers who prefer everything to be as it was in the old machines.

The ZANGS MSC-controlled series, as well as the MSC-M and MSC-D controlled machines by ZSK, all ran at a constant speed of 700-750 RPM. Depending on the embroidery field size, these machines automatically switched to the jump stitch:

- 500-stitch fields with 9.0mm stitches
- 700-stitch fields with 7.5mm stitches
- 900 and 1000-stitch fields with 6.6mm stitches

The Constant Speed function was introduced during the Purple Generation to avoid jump stitches under 12.7mm stitch length by maintaining a consistent speed. It's exclusive to the earliest MSC-I-controlled machines and is retained in the software as a historical feature, even though it's not available for current machines..

REQUIRED SAFETY FEATURES BS (FOR FAT)



Required safety features for FAT

1. Raised protective housing
2. Emergency stop left with yellow ring
3. Emergency stop/switch right
4. Light barrier for thread tension lever protection
5. Light barrier needle area
6. Light barrier back (recent position)
7. Light barrier bottom
8. Machine status indicator
   green (on top) > embroidering
   red (at bottom) > machine downtime
   red flashing > thread breakage
9. Thread tension lever protection
10. Sticker + electrical earthing on both side plates
11. Lifting eyes removed + plug
12. Start/Stop icons on buttons + sticker

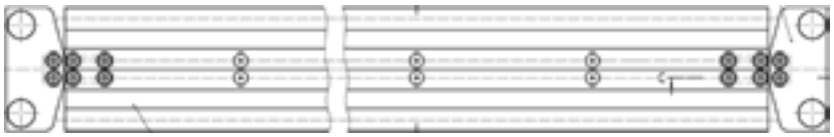
Additionally

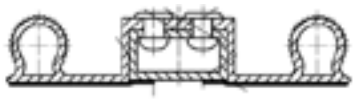
13. Sealed cable gland
14. All cables labled according to wiring diagram
15. Seal the machine sides with foam (similar to carbon protection).
16. Do not supply lubricants and JCW35 with the machine.
17. Seal holes in the machine sides with screw, washer and nut.

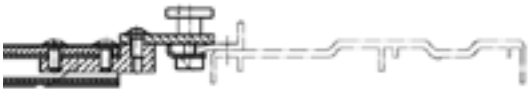
FRAME DIVIDER

All three systems are so flat that they can usually pass underneath the F-heads.
For W-head machines, it may be necessary to check whether any attachments could obstruct the clearance. All three types are 1:1 exchangeable.

Old System - Clips included



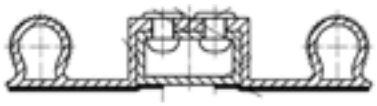




Different length available e.g.:

Art.No.:	Description
280999983	DIVIDER (T) 500 KPL.

New System - Clips included

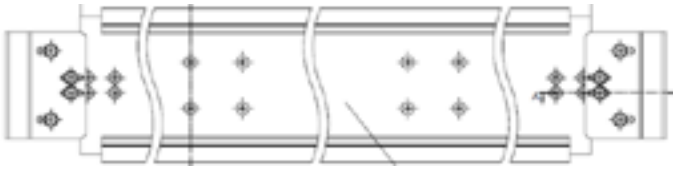


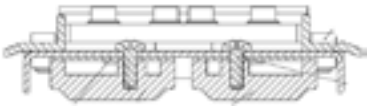
Different length available e.g.:

Art.No.:	Description
270011965	DIVIDER (T2) 500 kpl.

Optimized connection to pantograph - more stable.

New System - Standard Clips not included





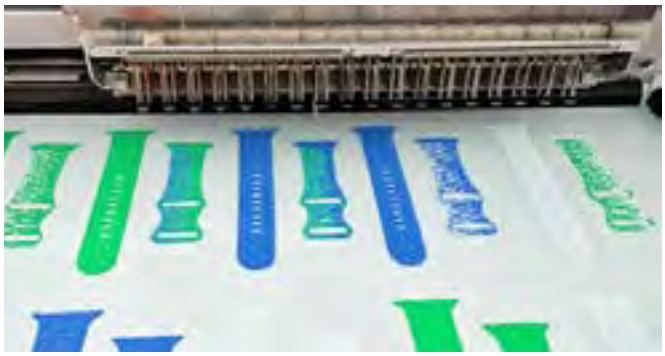
Different length available e.g.:

Art.No.:	Description
270011977	DIVIDER (L=700mm)
275111916	DIVIDER (L=1400mm)
270011976	DIVIDER (L=2000mm)

Optimized connection to pantograph - more stable.
Standard clamps

TPU EMBROIDERY

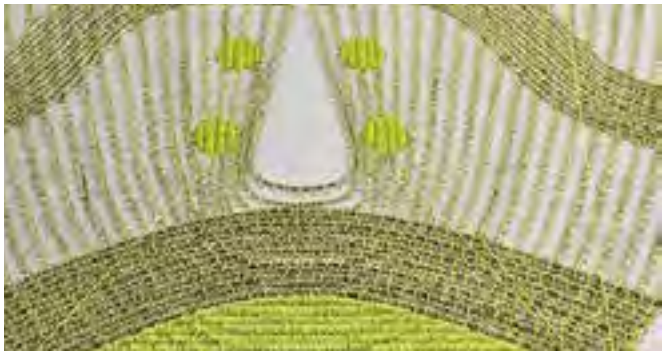
TPU-coated thread embroidery offers design flexibility and functional benefits. During stitching, it behaves like standard thread, but heat pressing transforms its properties. Adjusting pressure and temperature creates finishes from glossy to matte or soft to laminated, resulting in a durable, rubberized surface that enhances aesthetics and performance.



Functional Advantages:

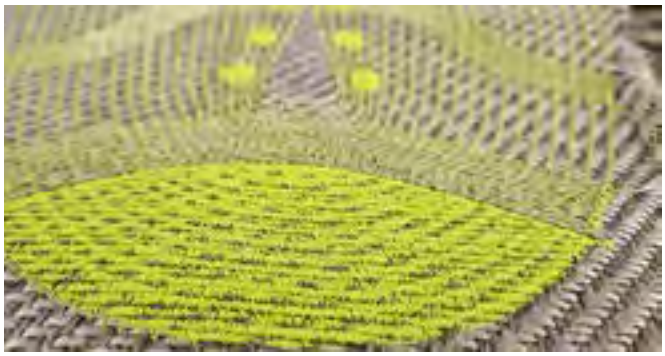
- Abrasion resistance – Increased durability for high-wear areas
- Water resistance – Improved protection against moisture
- Structural stability – Embroidery becomes more rigid after pressing

TPU & TFP Integration:
ZSK machines enable one-shot production by combining Tailored Fibre Placement (TFP) with TPU embroidery for customized performance.



Watch Straps:
TPU threads applied with precision for enhanced durability and detailing.

Shoe Uppers:
Flax natural fibers reinforced with TFP, combined with TPU embroidery for waterproofing and abrasion resistance. This process allows customized material behavior within a single production step.



Sample Production:

- Shoe upper – ZSK JCW 0100, flax fabric & fiber with TPU thread
- Watch straps – ZSK Sprint 7, TPU thread on polyester fabric

RACER EXTENDED SHELVES

RACER machines without tabletop, shelves for embroidery goods and tools with a depth of 460 mm are installed. Due to high demand, shelves with a depth of 760 mm are also available as an option. These can be easily retrofitted or exchanged.

1100x760 mm	**Art.No.: 990.233.800**
1540x760 mm	**Art.No.: 990.233.801**
2110x760 mm	**Art.No.: 990.233.802**
2910x760 mm	**Art.No.: 990.233.803**
3895x760 mm	**Art.No.: 990.233.804**

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