MADE
IN
GERMANY

Cording Device EP1.2

User Manual

Installation and Operating

Inhalt

DEVICE DESCRIPTION AND SPECIFICATION

1. DESCRIPTION OF GENERAL PURPOSE

Appliance "Cording Device EP1.2" designed for mounting on the needle №1 of the embroidery head ZSK embroidery machine. Together with embroidery machine this device allows to perform decorative cording embroidery using cord of different diameter 0.8 to 4.0 mm.

!!! Attention: The appropriate T8 software (T8/T8-2 Release 02.03.2013 + V40 5100) should be installed before using the present cording device. Section T8 – Engineer ZSK - DIP Switches - install: S145-S148 should be set to 1000.

Appliance for cording embroidery consists of Cording Device EP1.2 BUS controller, Control Panel. Cording device (*photo 1)* should be installed from the right side of embroidery head.

1.1. GENERAL TECHNICAL SPECIFICATIONS

Cord diameter	**0.8…4.0 mm**
Maximum cording speed	**900 st./min**
Embroidery Space Limit:	
1) Right	**70 mm**
2) Left	**15 mm**
3) Front	**105 mm**
4) Behind	**15 mm**
Supply voltage	**+24 V (±10%)**
Consumed power	**1,5 A**
Size:	**90x150x340 (mm)**
Weight, net	**1990 g(ZSK)**
	2240 g(Tajima)

COMPLETE SET for ZSK embroidery machine		
1)	Cording device EP1.2(№7000000) with adapter KSP 10	**1 pcs.**
2)	Bobbins (№7042060)	**2 pcs.**
3)	Special Needle bar(№7001062)	**1 pcs.**
4)	BUS Controller (Photo 1.2)	**1 pcs.**
	NOTE: One BUS CONTROLER for one embroidery machine	
5)	Control Panel (№2020000) with cable (4) (Photo 1.3)	**1 pcs.**
	NOTE: One BUS CONTROLER for one embroidery machine	

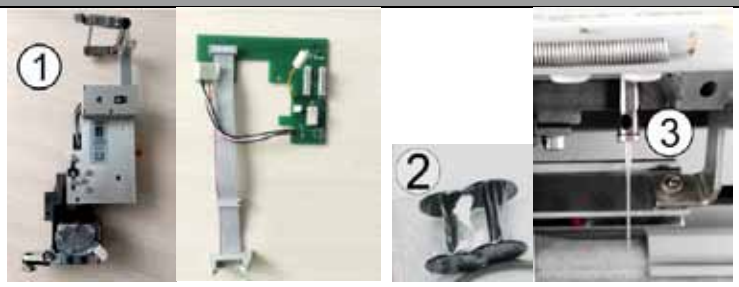
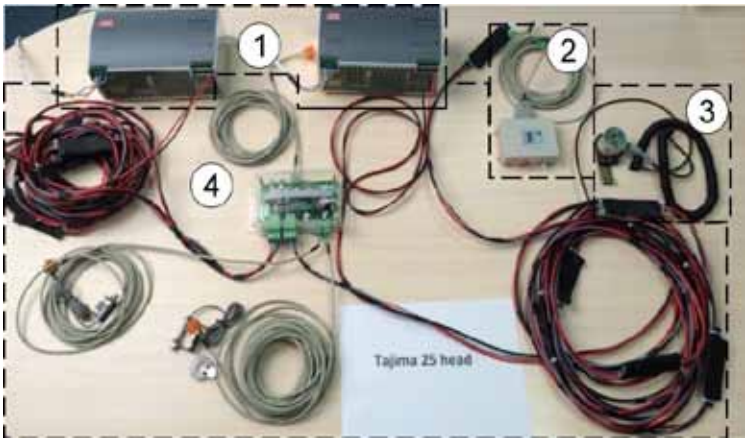


Photo 1.1

Photo 1.2

Photo 1.3

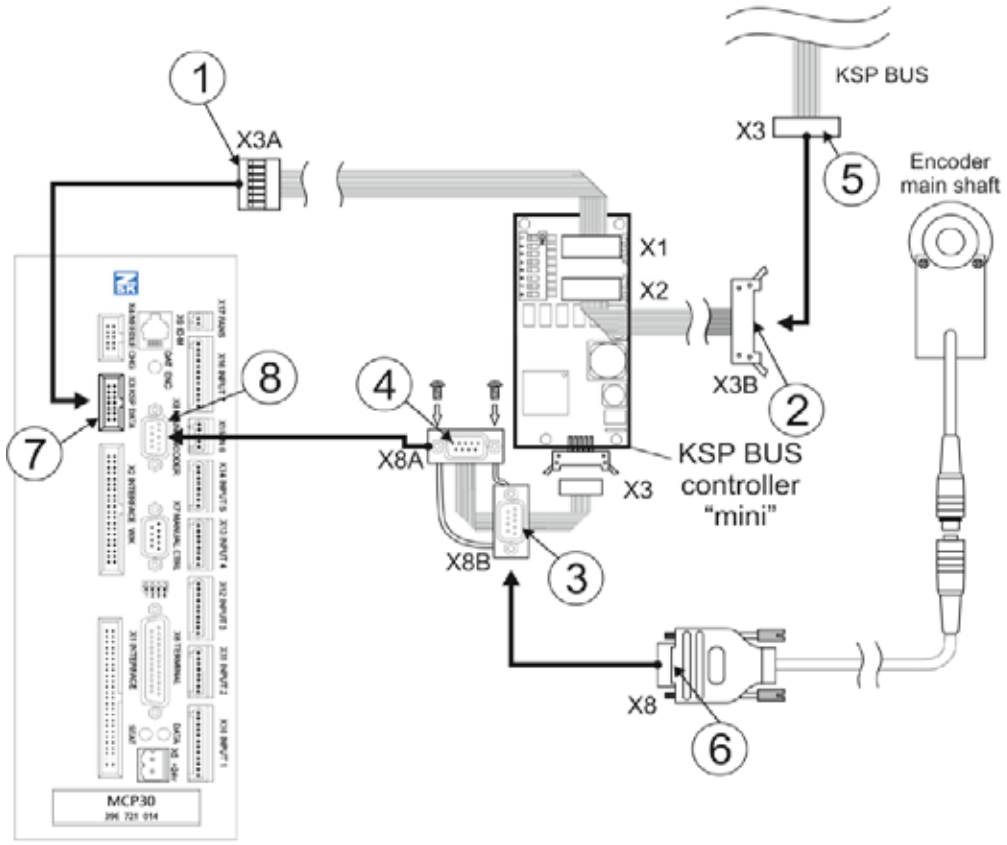
COMPLETE SET for Tajima embroidery machine (example embroidery machine Tajima 25 head)	
1) Power Supply Meanwell DRP-480-24- 2 (2) pcs. **<u>NOTE:</u> For the 15 embroidery heads requires one power supply**	
2) Control panel(№2020000) including cables(№2003000) -1 sets **<u>NOTE:</u> One Control panel for one embroidery machine**	 
3) Optical sensor (№9010000) including cables() -1 sets_ **<u>NOTE:</u> One Optical sensor for one embroidery machine**	
4) Control Block EP1.2 (№9040000) including cables and sensors -1 sets	
5) Cording device EP1.2(№7000000) with special needle bar(№7001063)	
6) Bobbins (№7042060) 2 pcs.	

INSTALLATION CORDING DEVICE EP1.2 (ZSK KSP-10)

Mounting commuting module “KSP BUS CONTROLER MINI” into control system MSCF MCP30

ATTENTION! PERFORM WORK ONLY WHEN THE EMBROIDERY MACHINE IS POWERED OFF.

KSP BUS CONTROLLER MINI COMMUTING SCHEME MCP30



2.1.1 KSP BUS CONTROLLER MINI (*Photo 2.1.1*)

1 – to system
2 – for KSP
3 – for ENCODER
4 – to X8 MAIN-ENCODER

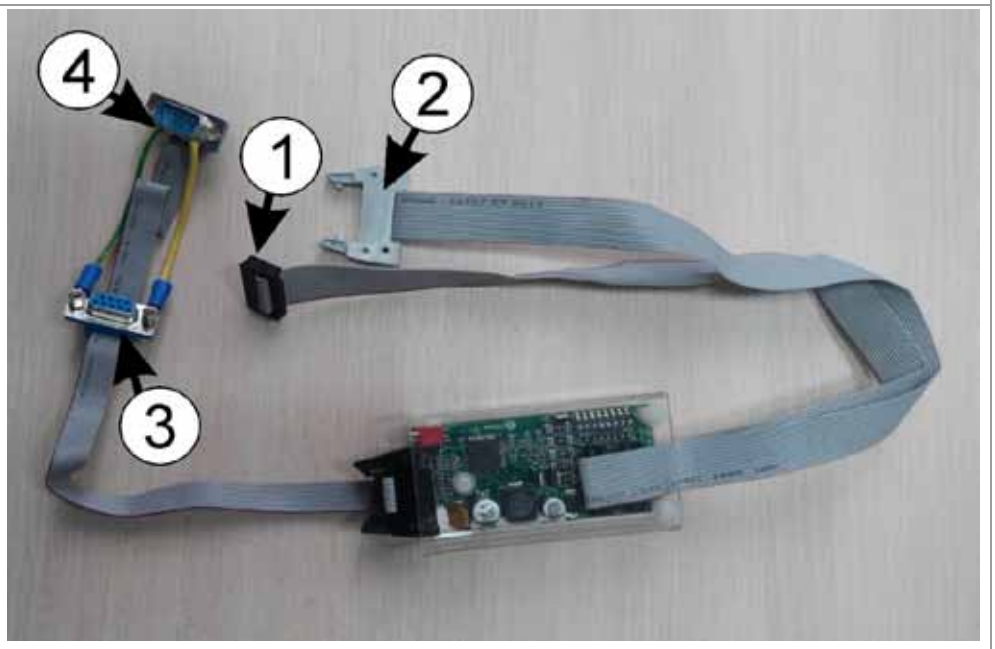
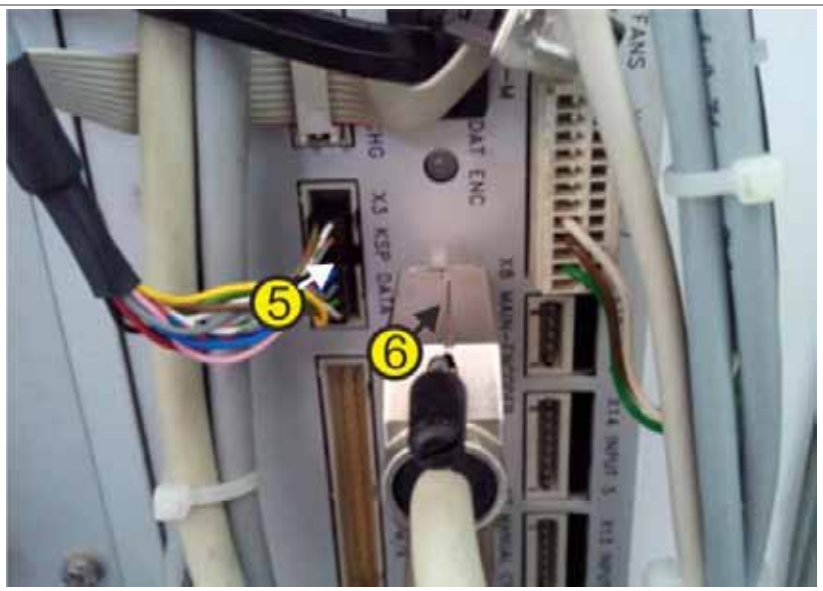
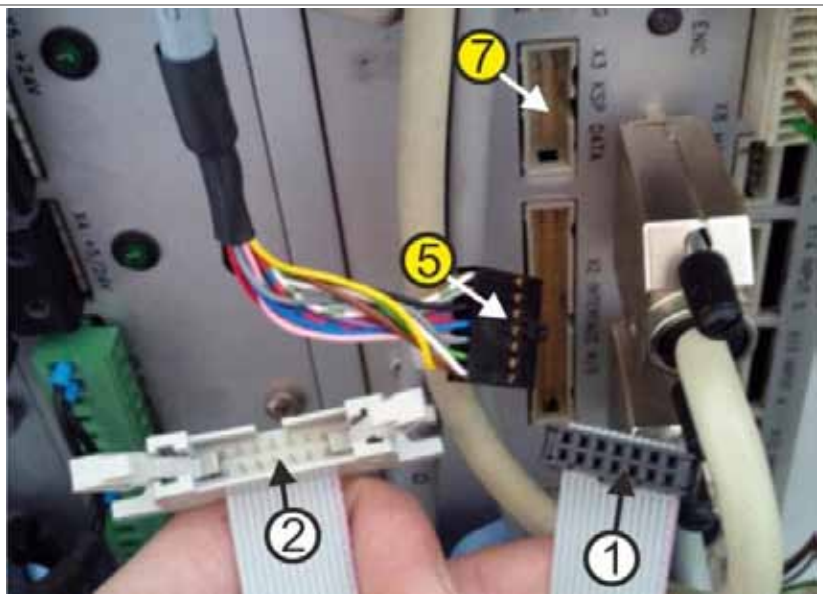
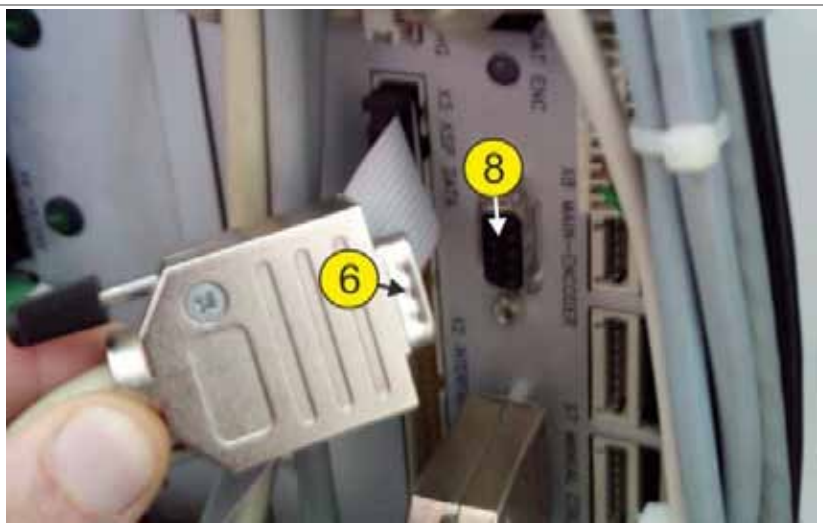


Photo 2.1.1

2.1.2 Two connectors need to be commuted X3 KSP DATA and X8 MAIN-ENCODER (*Photo 2.1.2*)	 ***Photo 2.1.2***
2.1.3 Disconnect socket (7) and plug (5) (X3 KSP DATA BUS) (Photo 2.1.3) Join plug(2) with the socket(5) and socket(1) with plug(7) (*Photo 2.1.3*)	 ***Photo 2.1.3***
2.1.4 Disconnect socket (6) and plug (8) (X8 MAIN ENCODER) (*Photo 2.1.4*)	 ***Photo 2.1.4***

2.1.5 Join the plug (6) with socket (3) and the plug (4) with socket (8) (*Photo 2.1.5*)

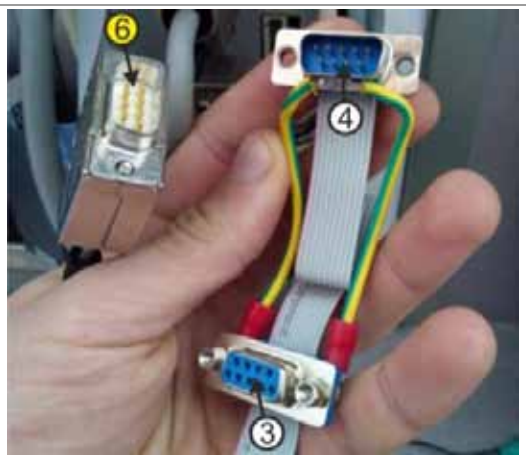


Photo 2.1.5

2.1.6 Check all connections (*Photo 2.1.6*)

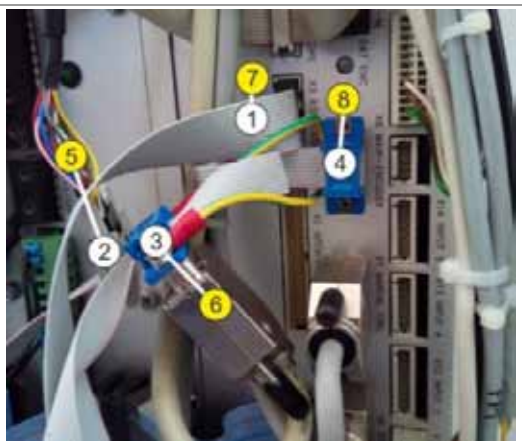


Photo 2.1.6

2.1.7 TURN ON the embroidery machine (in accordance with manual instruction for embroidery machine)

NOTE: If the KSP BUS CONTROLLER MINI plugged in correctly, embroidery machine should TURN ON without error message on T8. On KSP BUS CONTROLLER MINI should indicate green VD9 HWOT LED and red indicators: VD2, VD5, VD8 should blink red (Photo 2.1.8)

NOTE: If the indicator VD9 HWOT LED doesn't lit, TURN OFF the embroidery machine and change S10 switch position. (Photo 2.1.8)

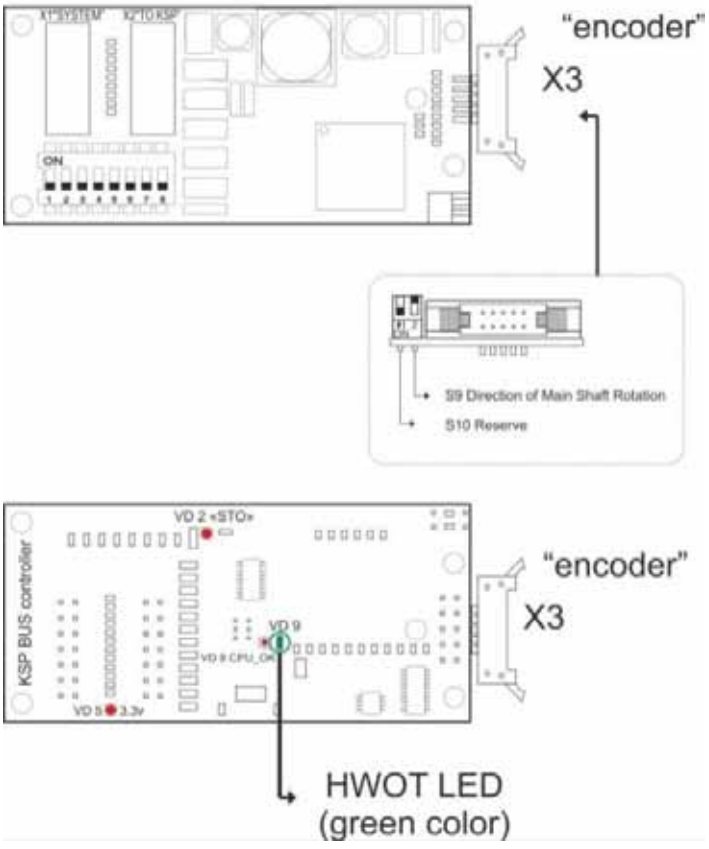


Photo 2.1.8

Mounting “ADAPTER KSP-10” to embroidery head JAFA/RACER

ATTENTION! PERFORM WORK ONLY WHEN THE EMBROIDERY MACHINE IS POWERED OFF.

2.2.1 ADAPTER KSP-10
(*Photo 2.2.1*)

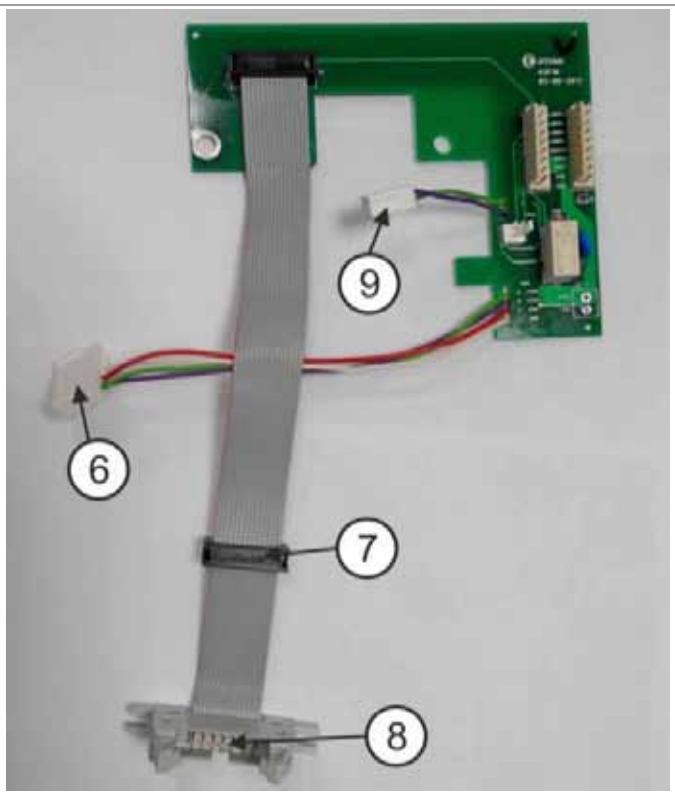


Photo 2.2.1

2.2.2 From the mounted on the embroidery machine KSP-10 PCB disconnect connector (5) (FLAT CABLE), connector (2) which is connected to the FBP PCB and connectors (4), (3) (NADEL MAGNET, FADENGEBER MAGNET) (*Photo 2.2.2*).

ATTENTION! WHILE MOUNTING BE CAREFUL NOT TO CHANGE SWITCH POSITION (A) ACCIDENTALLY (*PHOTO 2.2.2*)

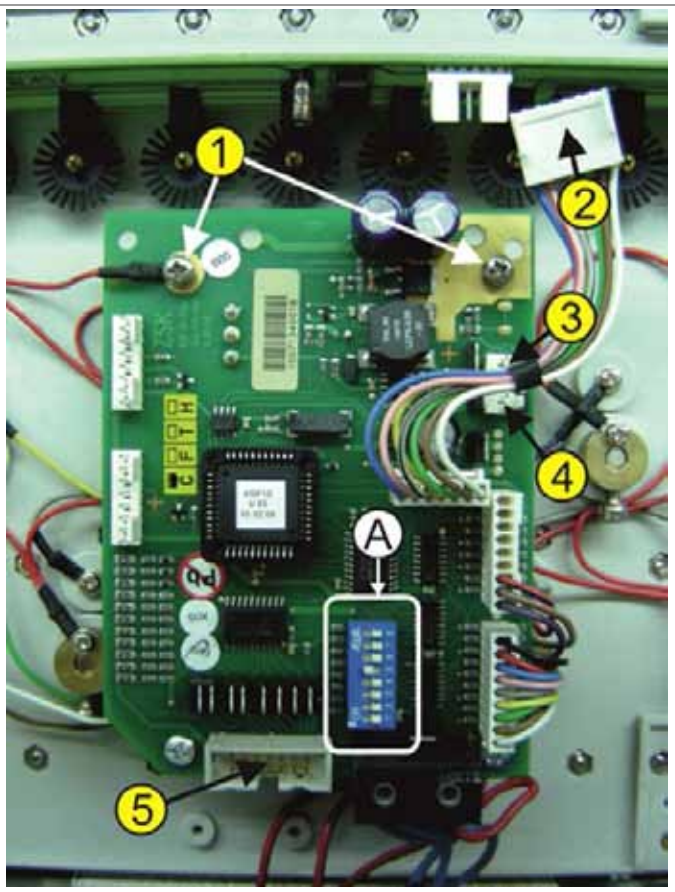


Photo 2.2.2

2.2.3 Remove two upper holding screws (1). Attach COMUTING MODULE KSP-10 to the upper part of the KSP-10 PCB (*Photo 2.2.3*).

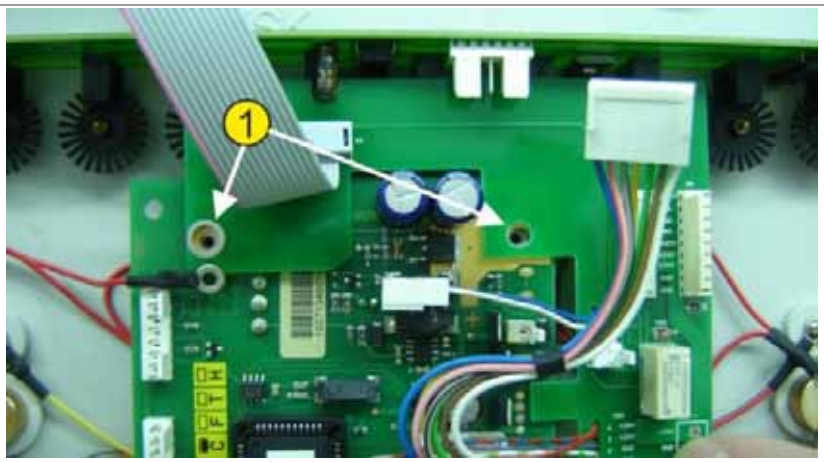
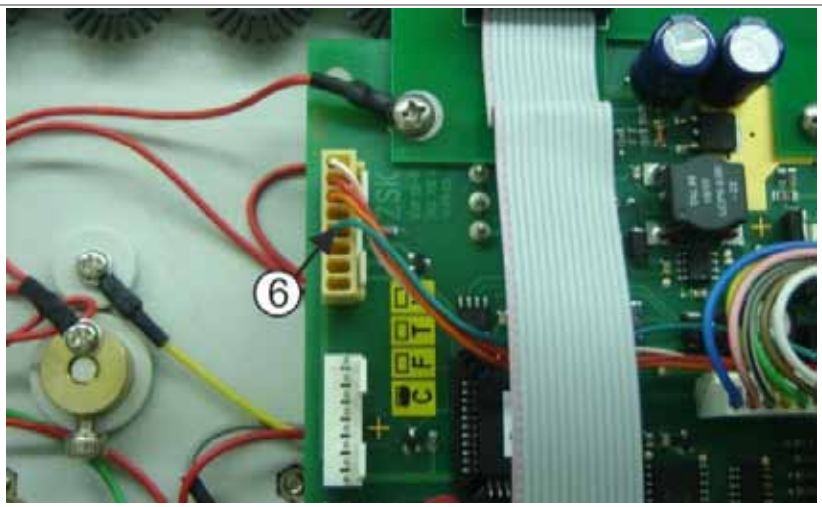
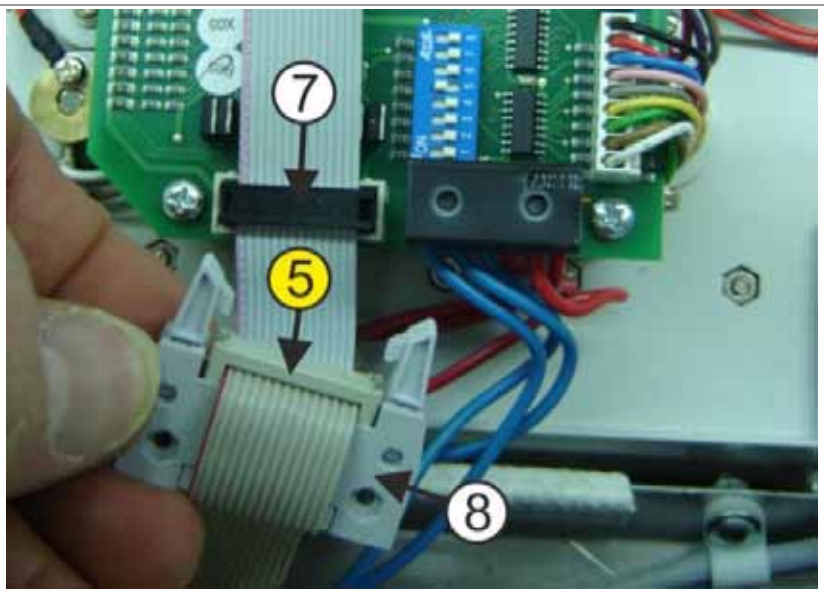


Photo 2.2.3

2.2.4 Pay attention to the terminal position, under the left fixing screw. Terminal should be properly fixed by the screw on ADAPTER KSP-10 to provide reliable contact (*Photo 2.2.4*).

	Photo 2.2.4
2.2.5 Join connector (6) from ADAPTER KSP-10 with connector X2 or X1 on the KSP-10 PCB (*Photo 2.2.5*).	 ***Photo 2.2.5***
2.2.6 Reconnect connector (2) to FBP PCB (*Photo 2.2.6*).	 ***Photo 2.2.6***
2.2.7 Join FLAT CABLE socket (7) from ADAPTER KSP-10 to plug X3 of KSP-10 PCB. Join plug (8) to the embroidery machine FLAT CABLE socket (5) (*Photo 2.2.7*).	 ***Photo 2.2.7***

2.2.8 Join ADAPTER KSP-10 socket (9) with KSP-10 PCB X9 plug (*Photo 2.2.8*). Join ADAPTER KSP-10 plug X6 with NADEL MAGNET (4) socket. Rejoin FADENGEBER MAGNET with KSP-10 PCB connector X10.

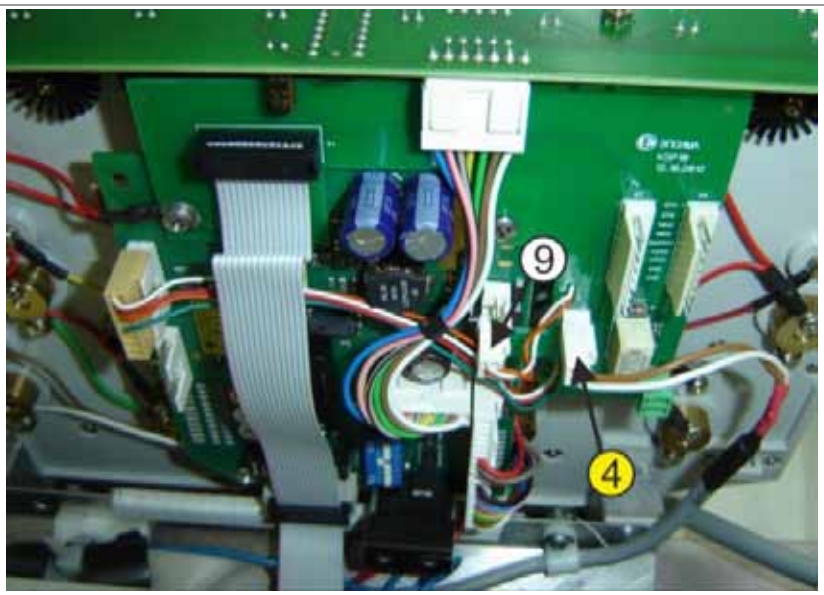


Photo 2.2.8

2.2.9 Connect control cable ZigZag-EP3 device (10) to ADAPTER KSP-10 connector X3 (*Photo 2.2.9*).

2.2.10 TURN ON the embroidery machine (in accordance with instruction manual)

NOTE: If ADAPTER KSP-10 installed correctly, the embroidery machine should TURN ON without any error message on terminal T8.

Photo 2.2.9

MOUNTING CORDING DEVICE EP1.2 TO EMBROIDERY HEAD JAFA/RACER

Mounting cording device EP1.2 onto embroidery head JAFA

ATTENTION! PERFORM WORK ONLY WHEN THE EMBROIDERY MACHINE IS POWERED OFF.

NO.1 DISMANTLING FOOT PRESSER OF THE NEEDLE BAR

3.1.1 Remove screws (1) (Photo 3.1.1(a)) and take off the embroidery head cover (Photo 3.1.1(b)).

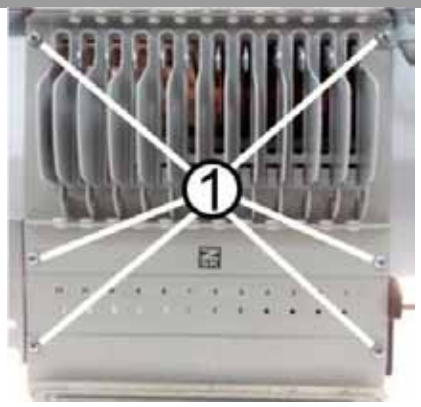


Photo 3.1.1(a)

Photo 3.1.1(b)

3.1.2 Loosen screws (2, 3) (Photo 3.1.2(a, b)), raise the needle bar up (Photo 3.1.3(a)).

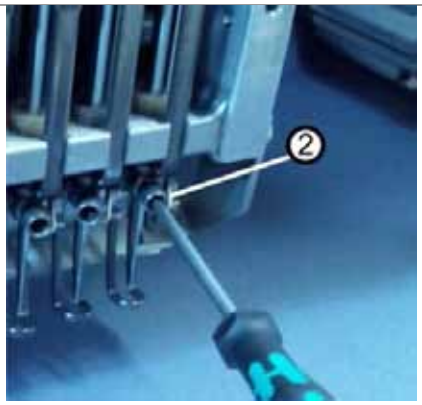


Photo 3.1.2(a)

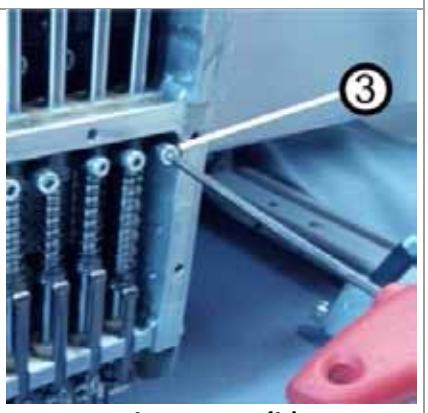


Photo 3.1.2(b)

3.1.3 Remove foot presser, spring, washer, needle holder. Change the needle bar to needle bar from complete set. (Photo 3.1.3(a,b))

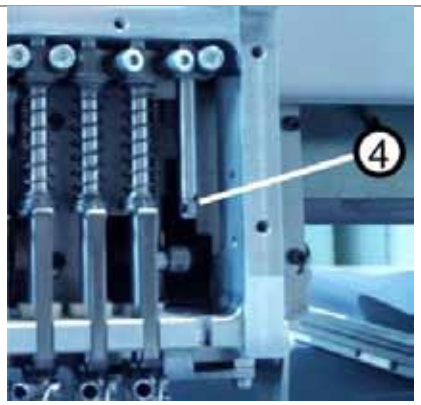


Photo 3.1.3(a)

Photo 3.1.3(b)

3.1.4 Lower needle bar and align top. Tighten screw (5) (Photo 3.1.4).

3.1.5 Insert needle, tighten the screw (6) to the stop (Photo 3.1.5).

Close the embroidery head cover.

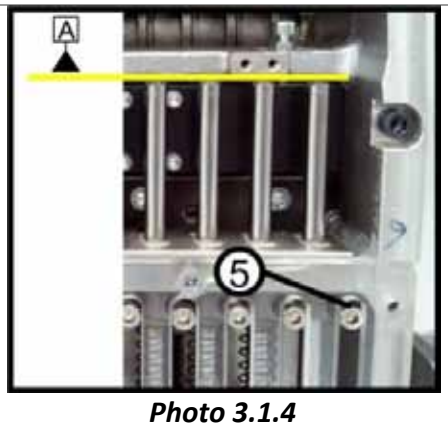


Photo 3.1.4

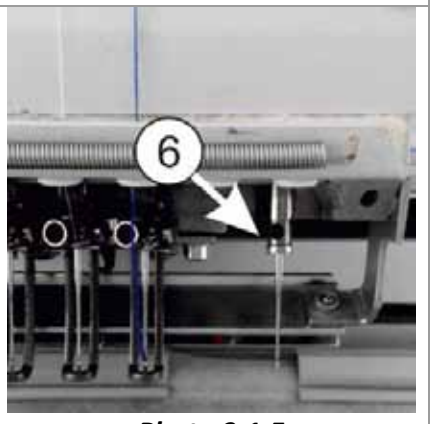


Photo 3.1.5

3.1.6 Using screws M6 (9) fix the plate to the embroidery head according to holes (8). Tighten the screws (10) (Photo 3.1.6).

NOTE: if lining is under M6 see the Appendix 1.

3.1.7 Aligning the pin with holes and attach device to the plate. If the device doesn't align with pins, loosen screw (11), to enlarge the gap for the pin. After the device was attached, turn screw (11) until it will touch pin's surface (Photo 3.1.6).

3.1.8 Repeat step 3.1.1 –3.1.7 for each embroidery head.

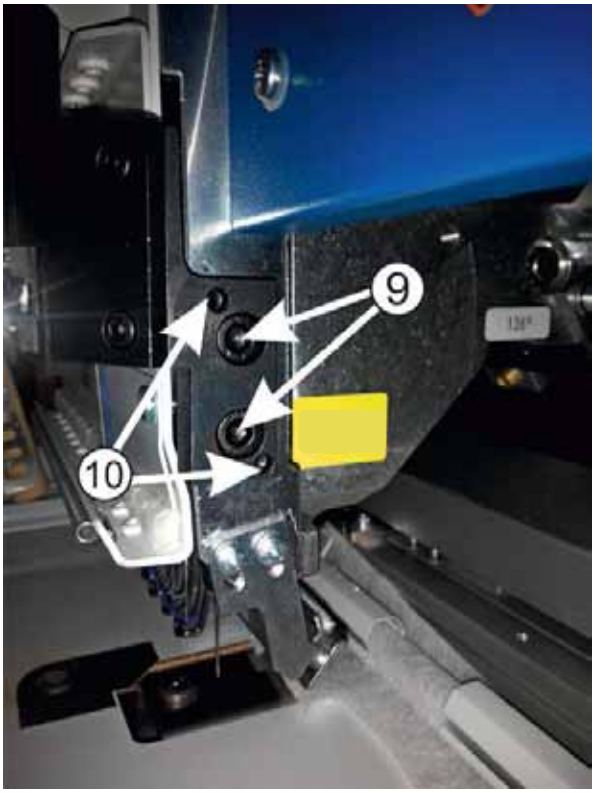


Photo 3.1.6

Check the installation of ZigZag-EP3 ver.2 relative to the needle bar

ATTENTION! SET TOGGLE SWITCH OF THE CRODING DEVICE EP1.2 TO THE MIDDLE POSITION AND CHECK NEEDLE BAR POSITION (EACH NEEDLE BAR SHOULD BE IN THE UPPER POSITION) BEFORE TURNING ON THE EMBROIDERY MACHINE.

3.2.1 Turn on the embroidery machine (in accordance with instruction manual). Set working needle – needle No.1. Toggle switch of the device set to the lower position. The head should go down.

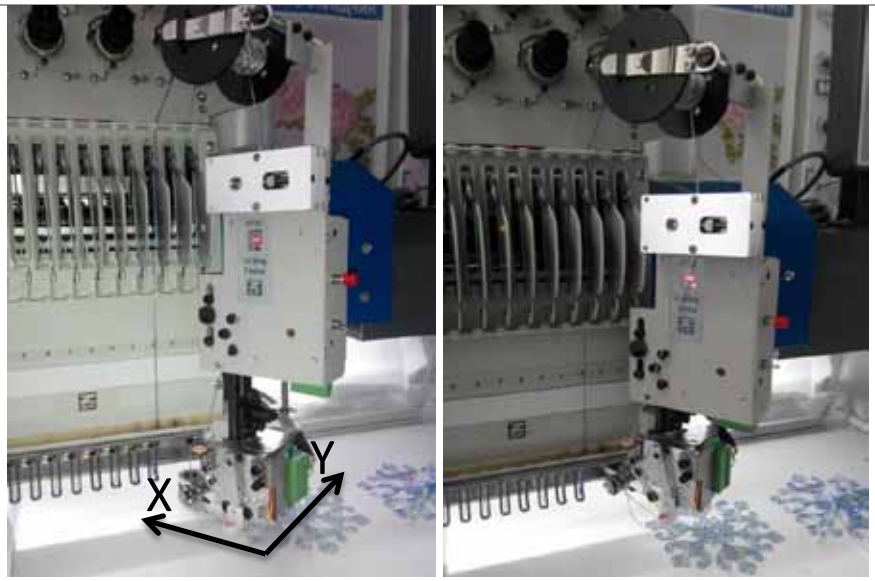
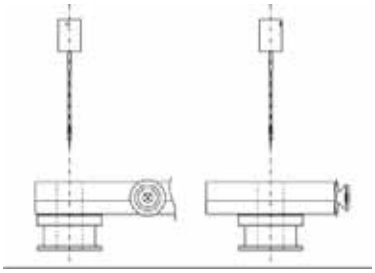


Photo 3.2.1

3.2.2 Check correct position of the device head relative to the needle bar No.1.

ATTENTION! Needle bar axis and axis hole should totally match. As shown in the picture. Photo 3.2.2



CORRECT

Photo 3.2.2

3.2.3 For displacement along X axis use screws (6) (Photo 3.2.3).

3.2.4 For displacement along Y axis use screws (5) (Photo 3.2.4).

Photo 3.2.3

Photo 3.2.4

FOR TESTING NEXT STEPS SHOULD BE PERFORMED

3.2.5 On the embroidery machine perform: SERVICE - TESTING MACHINES' MECHANISMS - MAIN SHAFT POSITION, set angle shaft position equal 180°. Starts testing with operation START TESTING.

3.2.6 After the machine has performed a given test push the magnet lever of bouncing stitch and lower needle bar.

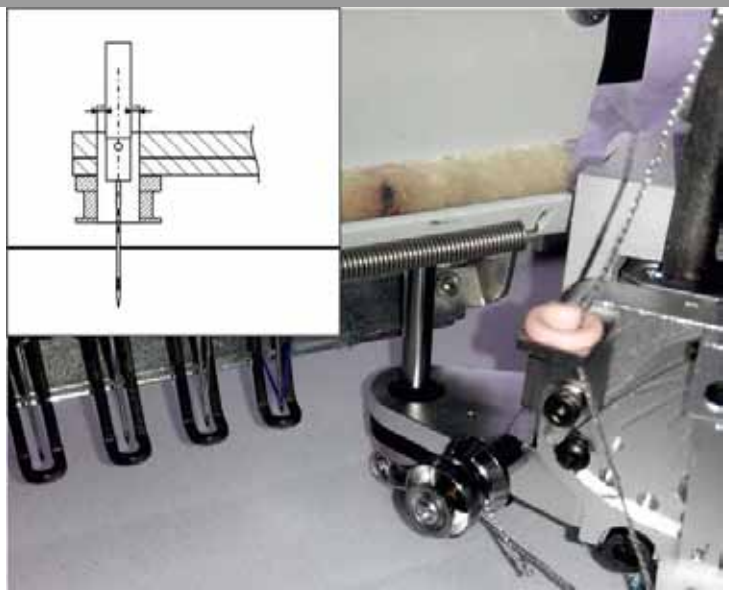


Photo 3.2.5

NOTE: the needle bar position should be at the hole centre of the cord rotation mechanism. (Photo3.2.5)

CONTROLS AND INDICATING MEANS

Controls and indication means of cording device EP1.2

EP1.2 cording device control performed by individual control buttons located on the device itself. This scheme is recommended for control, no more than 2 devices. To control a large number of devices (3 or more devices) performed using the optional CONTROL PANEL (CP).

WARNING INDICATOR (1) is used to alert about lifting-lowering the Cording Device head or disrepair device *(Photo 4.1.1)*.

7-SEGMENT LED (2) (*Photo 4.1.1*) is designed to display mode number and status of the device (Table 4.1).

THREE-POSITION SWITCH (3) (*Photo 4.1.1*) is designed for lifting (B) – lowering (C) the Cording Device head and blocking rotation of the cord's rotary mechanism (A).

SWITCH POSITION:

- B - top position
- A - middle position
- C - down position

BUTTON (4) is used to view the status and device mode selection (*Photo 4.1.1*).

VIEWING A STATUS. If you press the button - the indicator shows set number mode;

TURN OFF AND ERROR SIGNAL. When blinking "E" after the error if you press the button - the indicator stops blinking.

ATTENTION! TO PERFORM THE FOLLOWING FUNCTIONS THE SWITCH (3) SHOULD BE AT THE MIDDLE POSITION (A)

MODE SELECTION. Long press on the button and LED indicator mode number will flash, then by pressing and releasing the button, set the new mode.

NOTE: if you manage devices using individual controls operator should follow the rules set out in *Table 4.2*.

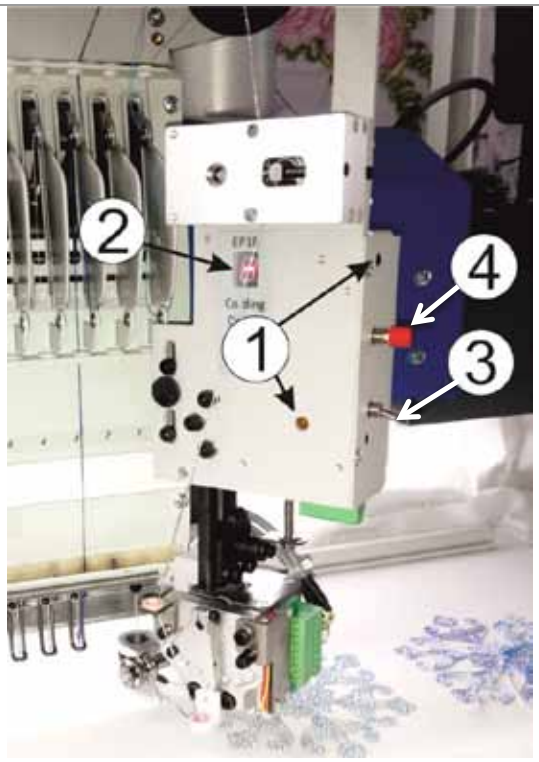


Photo 4.1.1

Table 4.1

Mode No.	Description of Operating Modes
1	Used for cords diameter 0.8 to 1.8 mm. Embroidery machine stops in cases when the cord ends or stuck (disable).
2	Used for cords diameter 2 to 4 mm. Embroidery machine stops in cases when the cord ends or stuck (disable).
3	Used for cords diameter 0.8 to 1.8 mm. Embroidery machine stops in cases when the cord ends or stuck (disable).
4	Used for cords diameter 2 to 4 mm. Embroidery machine stops in cases when the cord ends or stuck (disable).
Blinking E and No.	Error Message

Controls and indication means of “CONTROL PANEL” (CP)

INDICATOR (5) is used to display the cord rotation angle (*Photo 4.2.1*).

THREE-WAY SWITCH (6) (*Photo 4.2.2*) is designed for lifting (B) – lowering (C) the Cording Device head and blocking rotation of the cord's rotary mechanism (A).

SWITCH POSITION:

- B - top position
- A - middle position
- C - down position

BUTTON (7) - service.

BUTTON "- / +" (8) (*Photo 4.2.1*) are designed for setting cord angle.

Photo 4.2.1

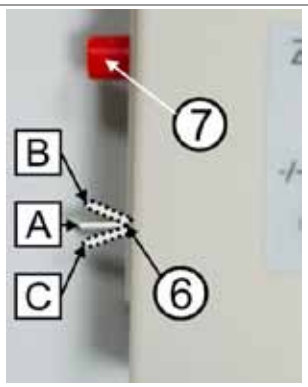


Photo 4.2.2

NOTE: setting the cord rotation angle is possible only with **CP**

NOTE: if you manage devices using **CP** operator should follow the rules set out in **Table 4.3.**

TABLE 4.2

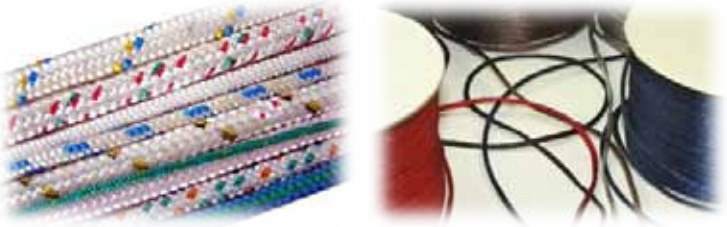
THREE-POSITION SWITCH	PERFORMS A FUNCTION	NOTE
Random position (A, B, C)	When changing a needle with number 1 on any other number- the Cording Device head is automatically lifted to the top (transfer) position	Function fails if thread breakage indicates on any embroidery head.
Top position (B)	The Cording Device head is lifted to the top (transfer) position	Top position (B) blocks work from control panel (CP)
Switching to a lower position (C)	The Cording Device head is lowered into the working position under the needle bar number 1.	In the process of embroidery, cord's mechanism rotates and cord is sewn
Switching to the middle position (A)	If the Cording Device head is in the lower (working) position, then in the process of embroidery cord’s rotary mechanism does not rotate and cord is not sewn	This function is used to perform the thread bar tack on embroidered material

TABLE 4.3			
DEVICE THREE-POSITION SWITCH	**CP THREE-POSITION SWITCH**	**PERFORMS A FUNCTION**	**NOTE**
Random position (A, B or C)	Random position (A, B or C)	When changing a needle with number 1 on any other – the Cording Device head is automatically lifted to the top (transfer) position from the lower working position.	Function fails if thread breakage indicates on any embroidery head.
No switching Recommended position (C) or (A)	Switching to the top position (B)	All Cording Devices' heads simultaneously rise in the middle position to perform thread trimming	Operator performs thread trimming (see "Methods embroidery")
No switching Recommended position (C) or (A)	Switch is in the top position (B). Operator briefly presses the button (7)	All Cording Devices' heads simultaneously rise to the top (transfer) position	This mode is used to switch to another needle
No switching Recommended position (C) or (A)	Switching to a lower position (C)	All Cording Devices' heads are lowered into the working position under the needle bar number 1.	In the process of embroidery, cord's mechanism rotates and cord is sewn
No switching Recommended position (C) or (A)	Switching to the middle position (A)	If Cording Devices' heads are in the lower (working) position, then in the process of embroidery cord's mechanism does not rotate and cord is not sewn	This function is used to perform the thread bar tack on embroidered material
No switching Switch is in the top position (B)	Switching to the random position (A, B or C)	The devices are not controlled by **CP**	This mode is used to disconnect **CP** from the device

CORDING

Types of cords, needles., materials

Cording device EP1.2 designed for embroidery flexible cords or electric wire with a diameter from 0.8 to 4 mm.
Embroider material thickness should not be more than 5 mm.
For cording recommended thread type is monofilament No.60 – No.40 or polyester.
Cording use the same types and numbers of needles that are recommended for use in ZSK embroidery machines.
Recommended cording speed is 900 stitches per min for all sizes of cords.

Twisted/braided cords.	
Bugle beads on cord	
Glass beads on cord. Sequins on cord	

Device configuration

NOTE: Select the mode for cord diameter at the *Table 4.1* and in accordance with chapter 4 CONTROLS AND INDICATING MEANS set the selected mode on the device or devices.

ATTACH THE COLLAR INTO POSITION OF CHOSEN CORD DIAMETER/MODE.

5.2.1 Set the device head to the top position (transport position) Set switch (3) into position **B**.

5.2.2 Check collar (1) position**.** Turn the switch (3) from position **B** to position **A** and vise versa from **A** to **B** position (Photo 4.1.1) (*Thus cord's rotary mechanism establishes the collar (4) by holes №1 or №2 to the reference point HOLE IN FRONT OF AN OPERATOR*).

EXAMPLE 1: If the hole, №2 corresponds to the selected mode and is on the needle axis (Z) (*Photo 5.2.3*) then collar installation is finished.

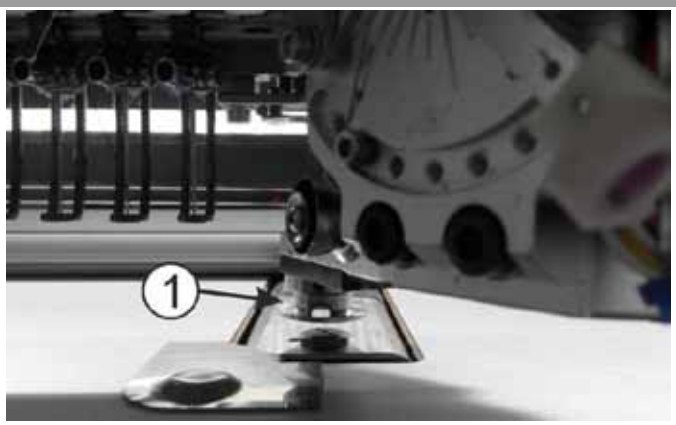


Photo 5.2.1

EXAMPLE 2: If hole №2 doesn't correspond to the chosen mode (must be №1) or location is not on the needle axis (Z) (*Photo 5.2.3*) then next steps should be performed:

5.2.3 Loosen three screws (2)

5.2.4 Take off the collar (1) from the cord's rotary mechanism.

5.2.5 Switch (3) (Photo4.1.2) from position B to position A and from A to position B (Thus the cording rotary mechanism sets to the reference point)

5.2.6 Put on collar (1) on the shaft of the rotary mechanism in accordance with (Photo5.2.3) and fix it with screws (2).

5.2.7 Repeat step 5.2.2

FOR CORDS DIAMETER 0,8 … 1,8 MM - HOLE №1.

FOR CORDS DIAMETER 2 … 4 MM - HOLE №2.

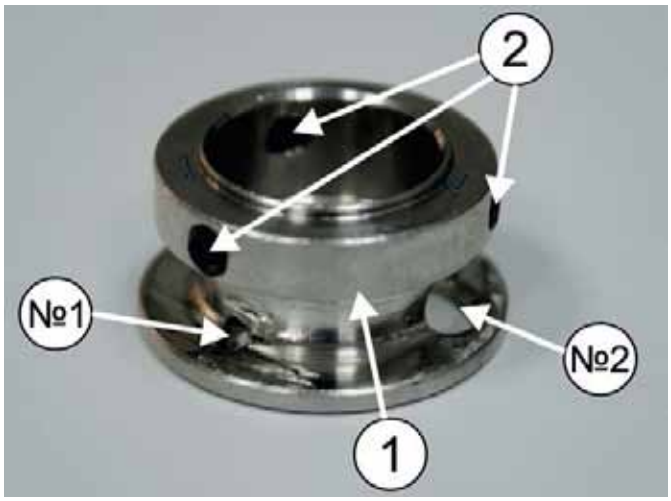


Photo 5.2.2

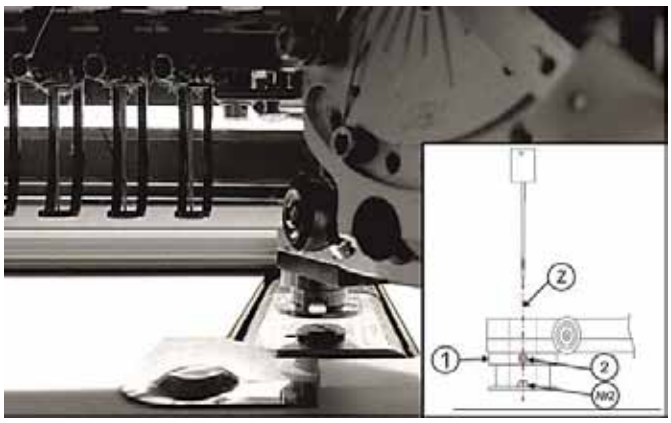


Photo 5.2.3

ADJUSTING THE GAP DEPENDING ON THE DIAMETER OF THE CORD

NOTE: For the chosen cord diameter it's necessary to set the gap **h** between the collar (1) and the top of the embroidered material **F**. The height of the gap

h = cord diameter + 1…2mm.
NOTE! For hard cords
h=2 * cord diameter

5.2.8 Lower the device head into the working position**.** Loosen the screw (3) and manually lower the head to touch the collar (1) with material surface **F**. Rise the head to a height **h** (*Photo 5.2.4*)

5.2.9 Tighten the screw (3) (*Photo 5.2.4*).

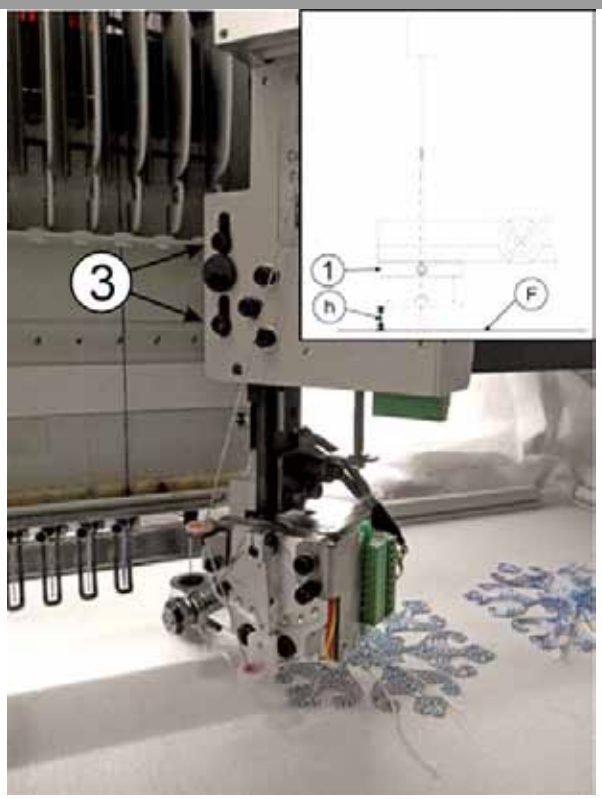


Photo 5.2.4

CORD LACE-UP

5.2.10 Adjust cord feeder mechanism compression force using screws (4) (*Photo 5.2.5*).

NOTE! It is important for thin cords

5.2.11 Check the automatic cord feeder by pressing the lever (5) (*Photo5.2.6*).

ATTENTION! SET THE MINIMUM CORD COMPRESSIVE FORCE FOR FRAGILE MATERIALS SUCH AS: BUGLE BEADS ON CORD; GLASS BEADS ON CORD; ELECTRICAL WIRE ETC.

5.2.12 Select cord tension by changing screw position (6).

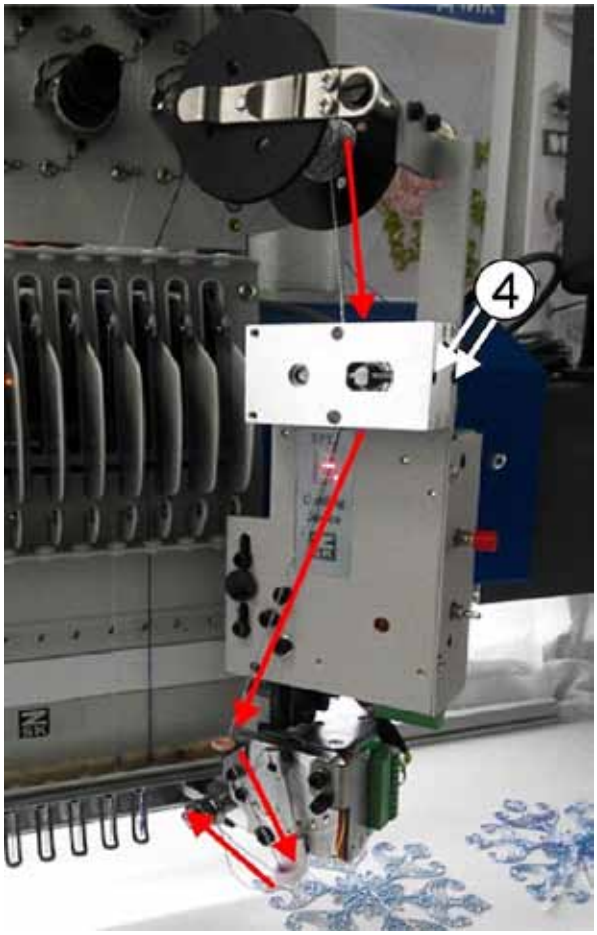


Photo 5.2.5

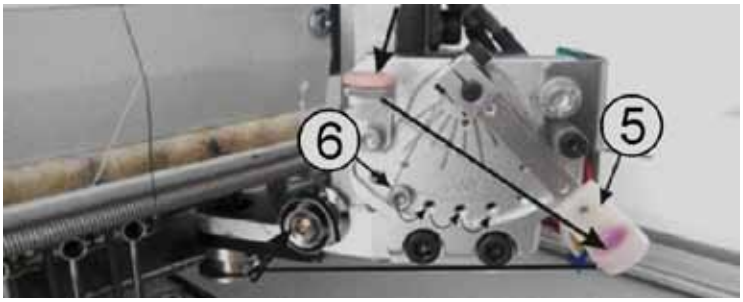


Photo 5.2.6

5.3. GUIDE FOR CORD EMBROIDERY PATTERNS.

5.3.1. GUIDE FOR DESIGNING EMBROIDERY PATTERNS.

ATTENTION! For embroidery device (EP1.2) make a new design. To construct the design, use the following important *essential requirements.*

- **In design, use only the «running stitch». Select the length of the stitch longer cord diameter (± 0.2 ... 0.5 mm).**
- **ATTENTION! NOT RECOMMENDED TO CREATE DESIGNS WITH THE INTERSECTION OF THE CONTOUR FOR BUGLE BEADS / GLASS BEADS TO PREVENT NEEDLE BREAKAGE.**
- **NOTE: For Cording with bugle beads/glass beads stitch length should be equal to the diameter of bugle bead / glass bead + 0.2 ... 1 mm.**
- **ATTENTION!!! Maximum length *of the jump* with a cord stitched into another starting point of not more than 250 mm.**

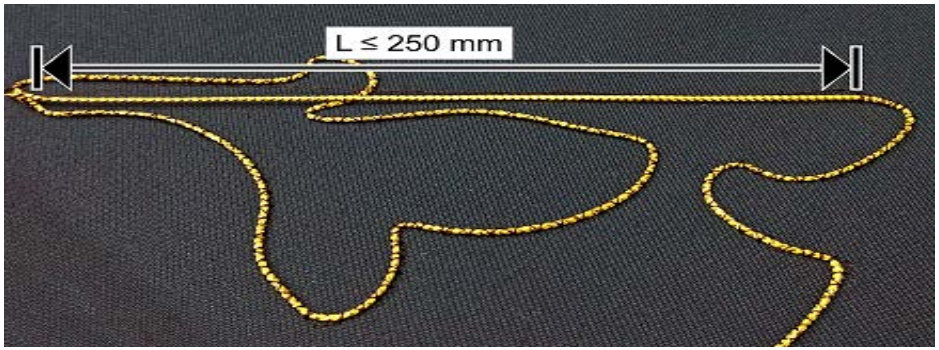


Photo 5.3.1.1

5.3.2. GUIDE FOR OPERATOR DURING EMBROIDERY.

ATTENTION! CHECK CONFORMITY OF EMBROIDERY FIELD, WITH THE SIZE OF EMBROIDERY PATTERN (BYPASS THE CONTOUR). TAKE INTO CONSIDERATION AN EMBROIDERY FIELD LIMIT IN MM (PHOTO 5.3.2.1).

NOTE: Activate the option CONTOUR before starting the embroidery. Using manual control of pantograph to set up embroidery pattern zone on the frame or hoop. Bypass the CONTOUR and check conformity of embroidery field with the size of embroidered pattern. **FOR SAFETY DO NOT LOWER THE DEVICE HEAD.** Bypass the CONTOUR once more and check conformity of embroidery field with lowered device head. Close CONTOUR option.

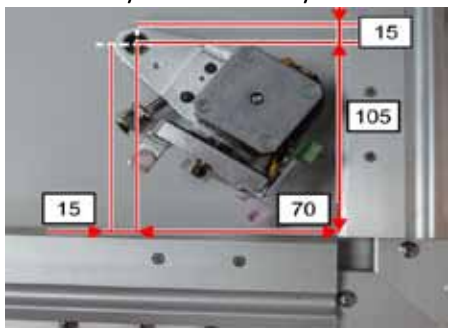
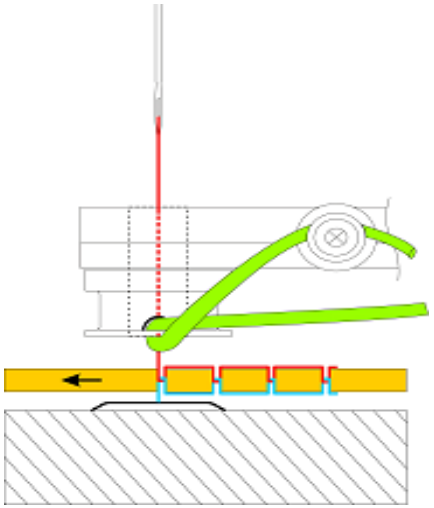
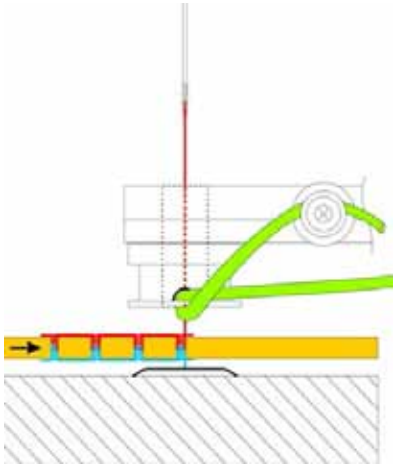


***Photo* 5.3.2.1.**

NOTE: For the chosen cord diameter it's necessary to set the gap **h** between the collar (4) and the top of the embroidered material **F**. The height of the gap **h = cord diameter + 1..2 mm**.

NOTE: If the cord lies in the design of two floors or intersect. For the chosen cord diameter it's necessary to set the gap h between the collar (4) and the top of the embroidered material F. The height of the gap **h = N* cord diameter + 0,5 (1) mm.** **N**-number of cords. *Photo 5.2.8*





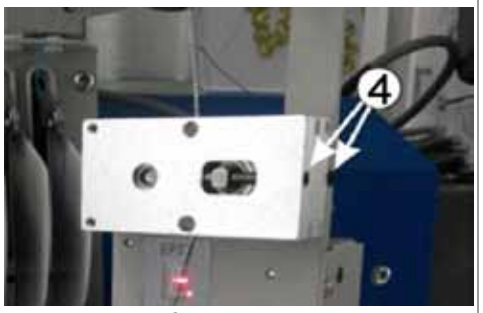


Photo 5.3.2.2

Adjust cord feeder mechanism compression force using screws (4) (*Photo 5.3.2.2*).

Check the automatic cord feeder by pressing the lever (5) (*Photo5.3.2.4*).

ATTENTION! SET THE MINIMUM CORD COMPRESSIVE FORCE FOR FRAGILE MATERIALS SUCH AS: BUGLE BEADS ON CORD; GLASS BEADS ON CORD; ELECTRICAL WIRE ETC.

ATTENTION! FOR CORDING WITHOUT A PROBLEM – KEEP DISTINCT SEQUENCE OF ACTIONS BETWEEN THE EMBROIDERY MACHINE AND THE DEVICE DURING THE EMBROIDERY PROCESS!

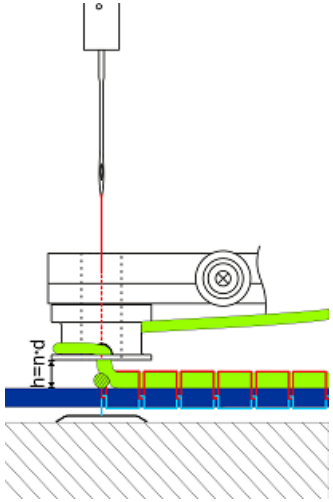
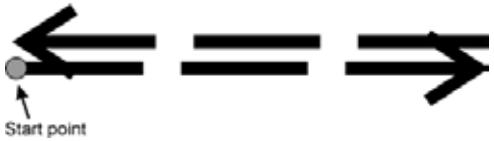


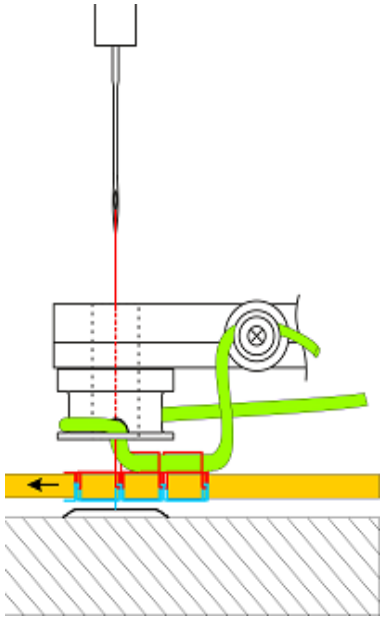
Photo 5.3.2.3

Photo 5.3.2.4

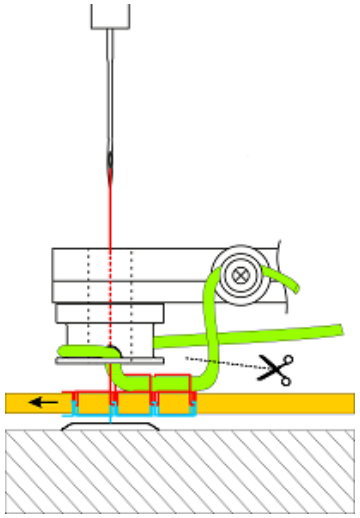
Select cord tension by changing screw position (6) (*Photo5.2.7*). **For hard cords do more spring force lever.**

5.3.1.1. The design should start with the tacking stitches intended to fix thread to the material. To do this, use only a «running stitches» (1,5 mm). Make at least 3 stitches in one direction, then 3 stitches back.



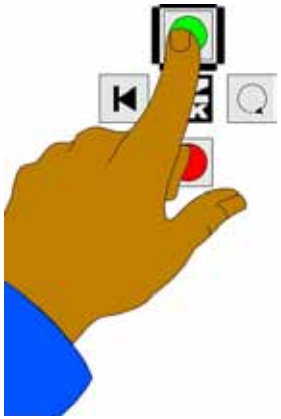


5.3.1.2 After fixing thread to the material, insert the running stitches in the line of the upcoming cord location. After 15…20 stitches insert the **STOP 1 for trimming (releasing from the clip) the tip of the cord.**



5.3.2.1. If the head of the device is positioned up, toggle the switch (6) (Photo 5.3.2.2) to the **C** position (the head will go down).

5.3.2.2. **Push the START button**



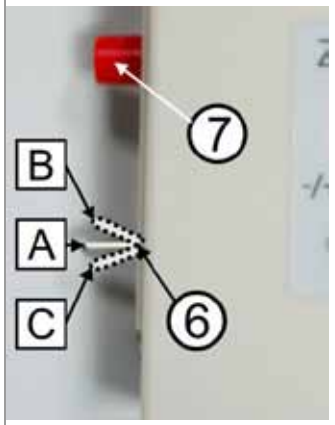
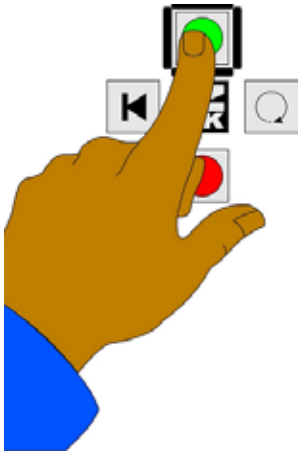


Photo 5.3.2.2

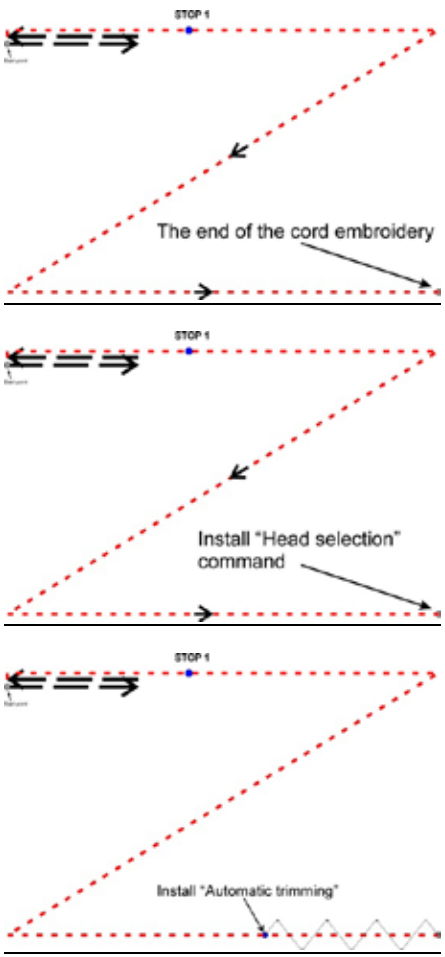


5.3.2.6. After the machine will stop **(STOP 1)**, cut or release the initial tip of the cord. Continue embroidering.

5.3.2.7. **Push the START button**

.

5.3.1.3. At the end of the sample, you must install the command "Head selection", then fix cord stitches like zigzag to the left or to the right by 20-25 mm and add an automatic trimming.



5.3.2.8. After AUTOMATIC TRIMMING has been performed, manually cut the cord and **push the START** button to complete the sample.

Recommendation:

- For correct work of the automatic trimming function, you need put before the tacking stitches, command "head selection".

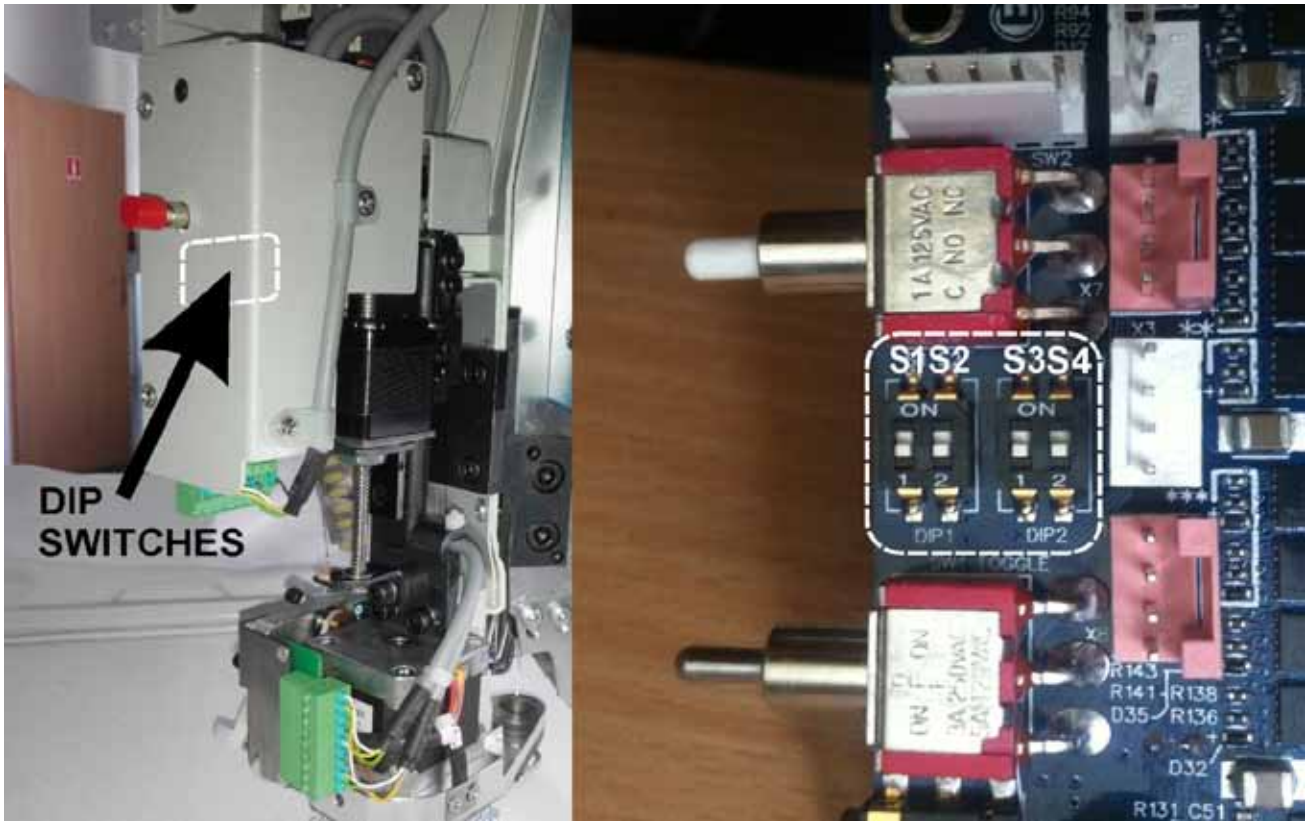
TROUBLESHOOTING CORDING DEVICE EP1.2

Errors and their solutions			
№	Error Code	Description	Remedy
1	E1	Hardware error means overloading a stepper motor driver. This error is caused by a fault in the control circuit of the stepper motors or stepper motor internal breakdown.	Reset the error by pressing and holding the button (4) (see photo 3) within 1-3 seconds. If the problem persists, disconnect the connector on the device, contact your service representative.
2	E2	Ring rotation motor of the cording device cannot get a "zero" point.	Check if there is any mechanical jamming, when the ring is rotated. Reset the error by pressing and holding the button (4) within 1-3 seconds.
9	E9	Overheating of the cording device control board. This error can be caused by high ambient temperature or degraded heat exchange of the device case. Possible damage to electrical circuit or stepper motors.	Check of both the cording device case and the control board temperatures. If possible, eliminate the cause of overheating. Reset the error by pressing and holding the button (4) within 1-3 seconds. If the error cannot be reset or it occurs frequently, contact your service representative.
5	Indicator on the device flashes	Cord jammed or out of.	Eliminate jamming or fill a new cord (see “Filling the Cord”).

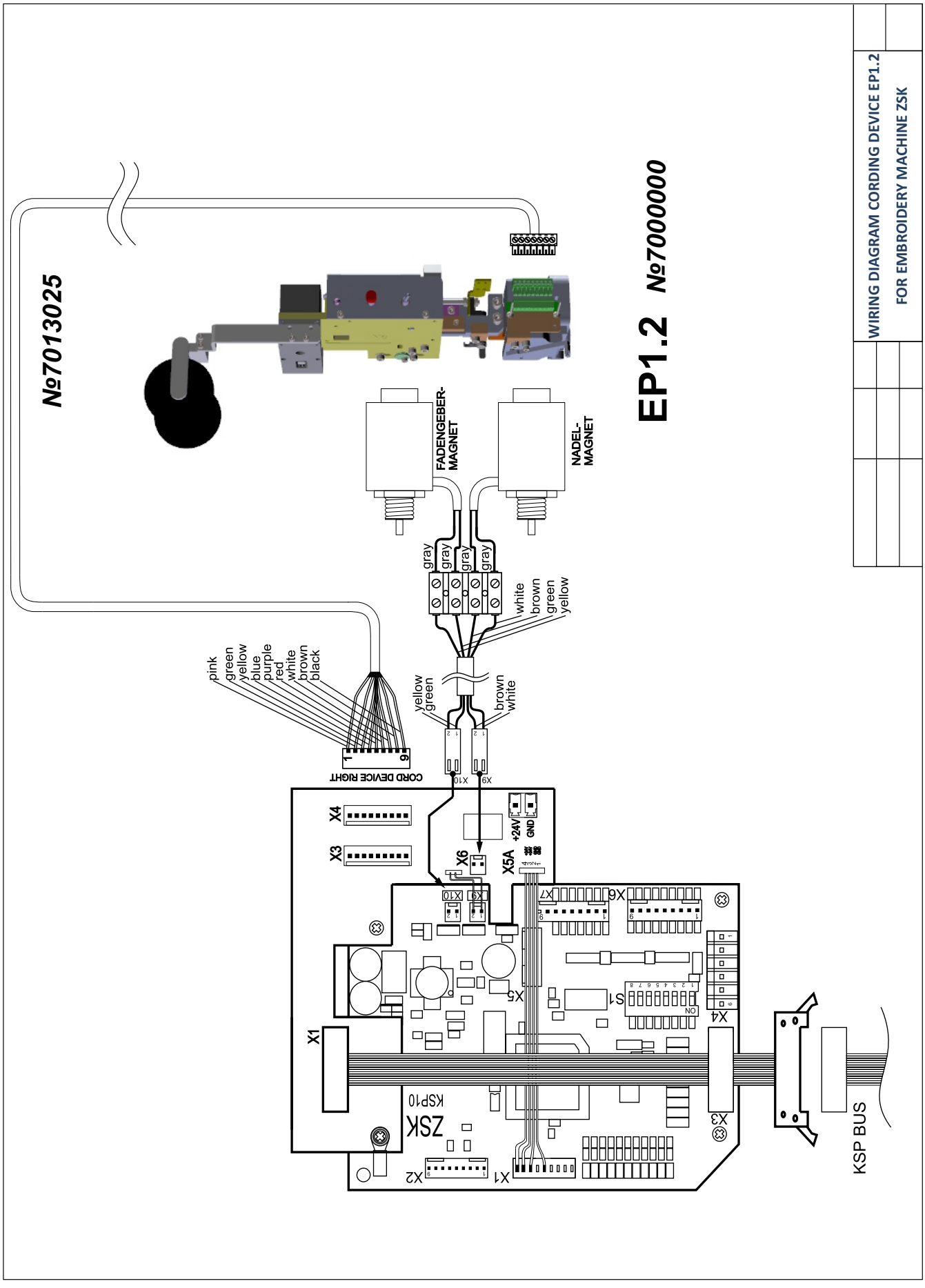
ADDITION

DEFAULT SETTING FOR CORDING DEVICE EP1.2

Assignment of DIP switches on the PCB device EP 1.2		
S1	On	Overheating control device is turned off
	Off	Overheating control device is turned on
S2	On	The direction of rotation of rolling cord clip
	Off	The direction of rotation of rolling cord clip
S3	On	Settings for work on embroidery machines Tajima
	Off	Settings for work on embroidery machines ZSK
S4	On	Automatic lowering function is disabled
	Off	Automatic lowering function is activated

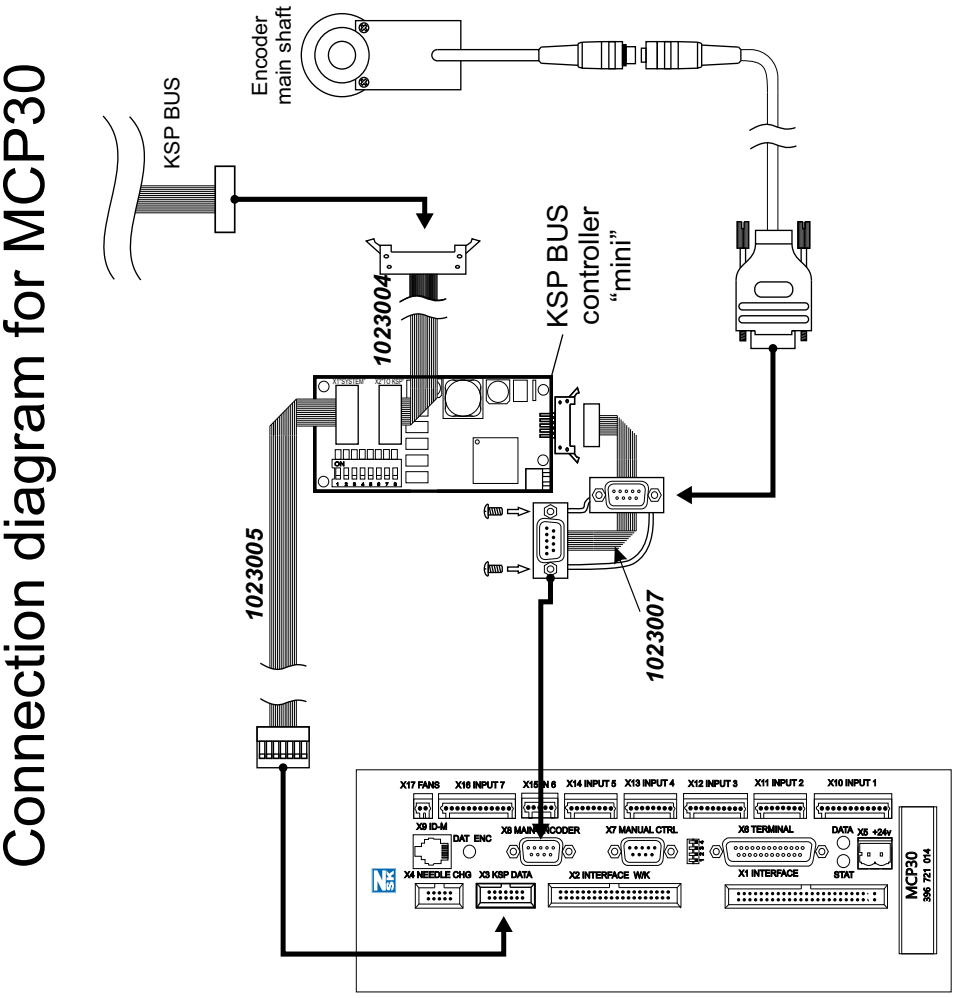


WIRING DIAGRAM CORDING DEVICE EP1.2 FOR ZSK EMBROIDERY MACHINE (MCP30)

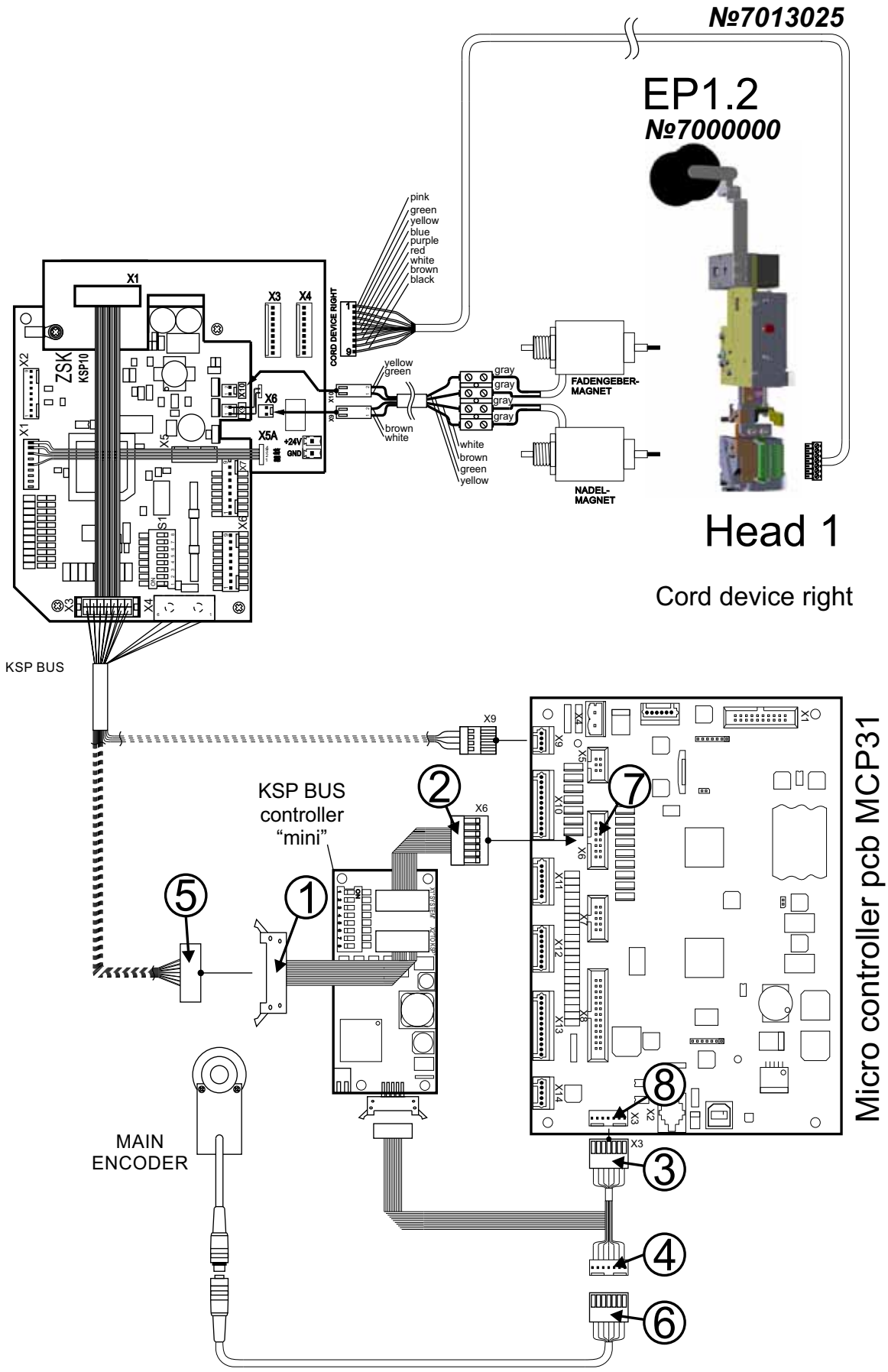


WIRING DIAGRAM CORDING DEVICE EP1.2
FOR EMBROIDERY MACHINE ZSK

Connection diagram for MCP30

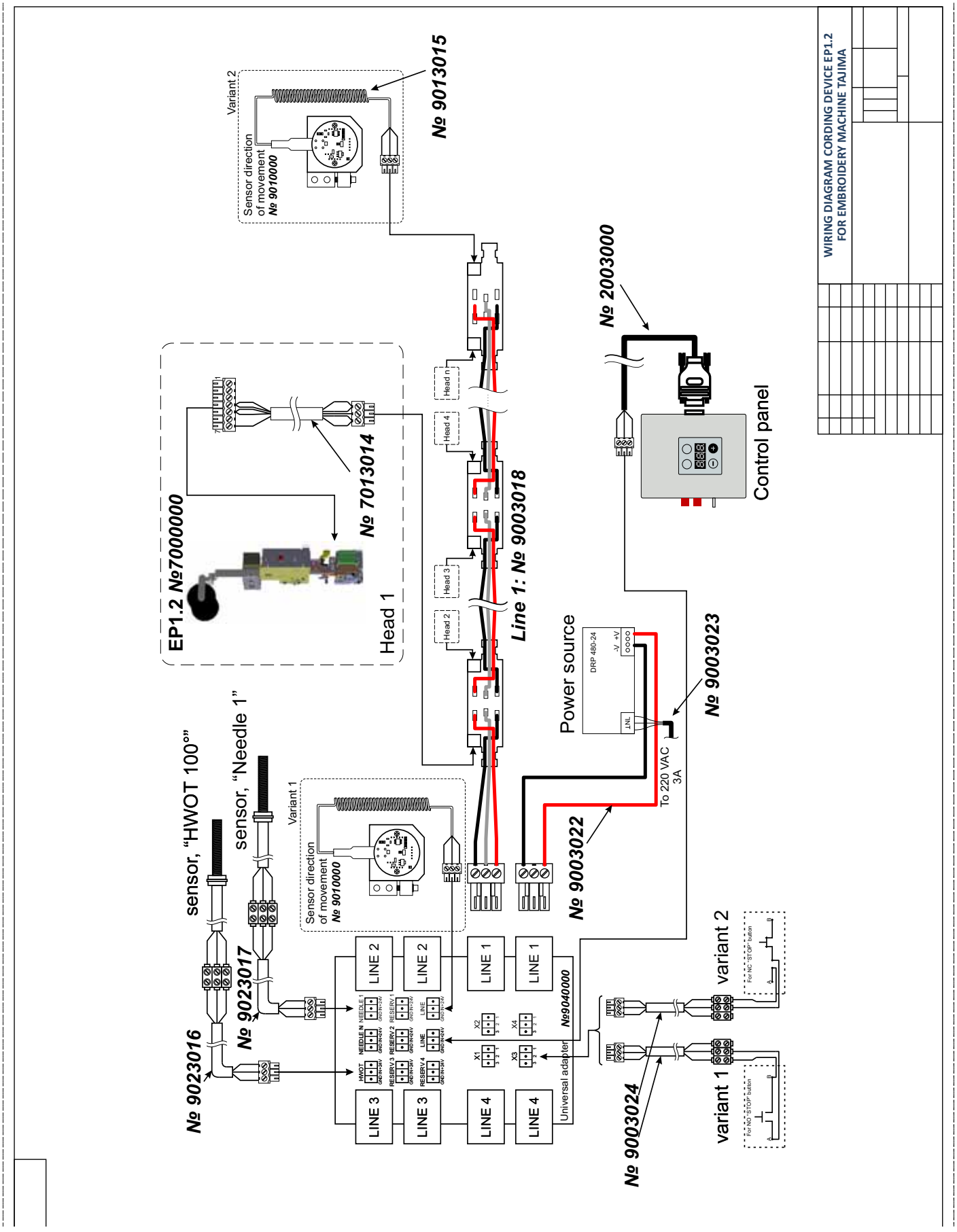


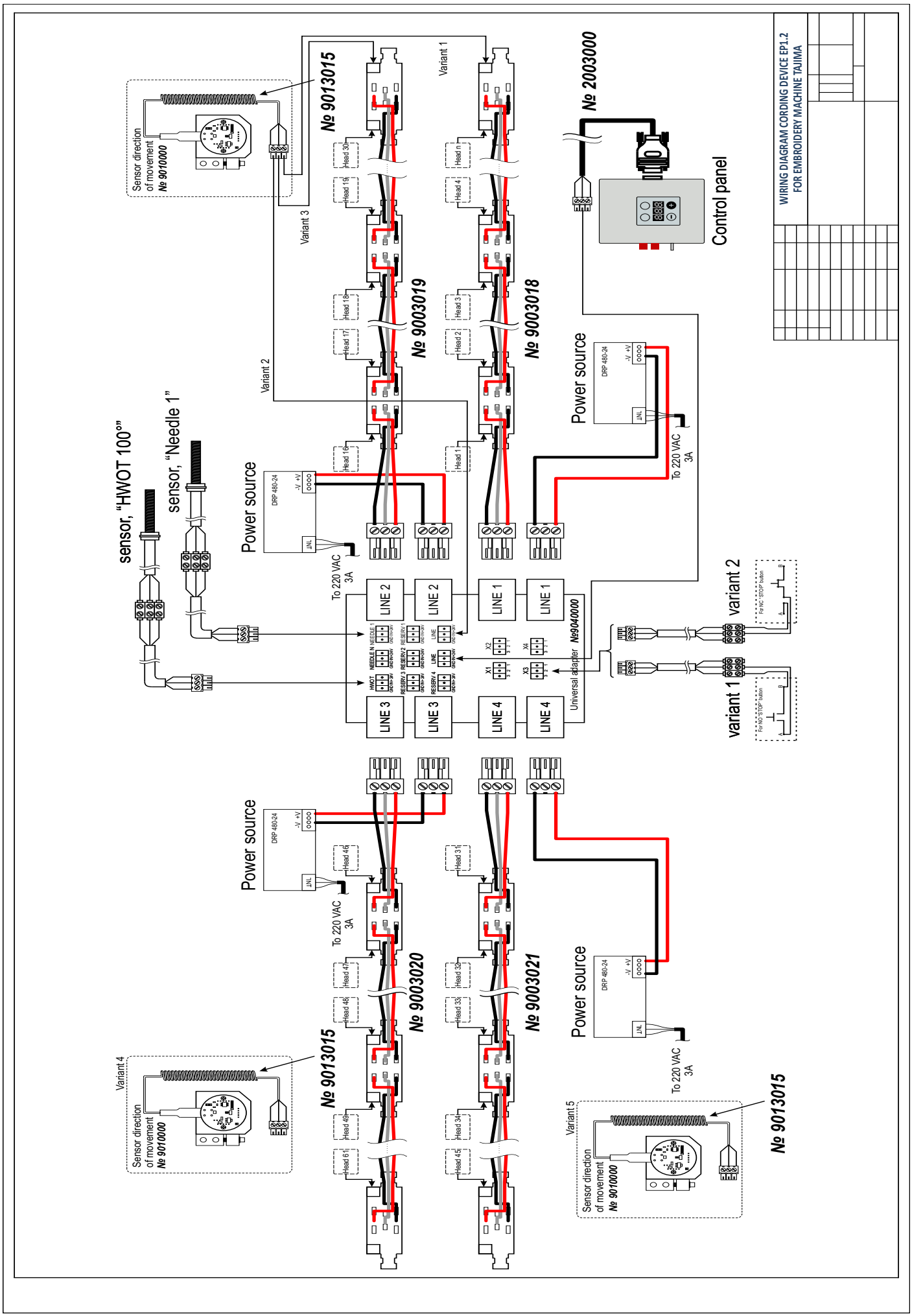
WIRING DIAGRAM CORDING DEVICE EP1.2 FOR EMBROIDERY MACHINE ZSK SPRINT (MCP31)

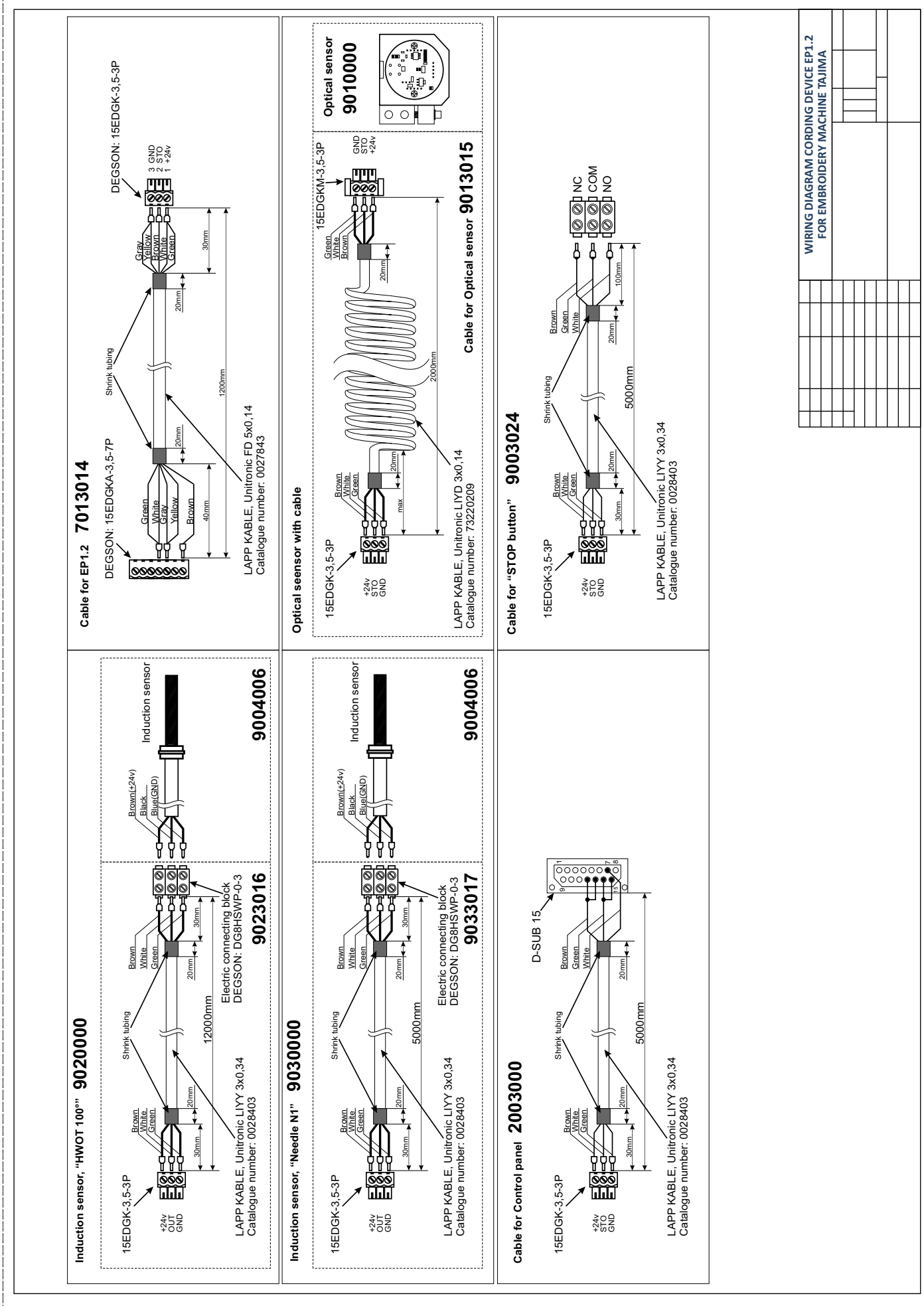


					WIRING DIAGRAM CORDING DEVICE EP1.2 FOR EMBROIDERY MACHINE ZSK SPRINT(MCP31)

WIRING DIAGRAM CORDING DEVICE EP1.2 FOR EMBROIDERY MACHINE TAJIMA




WIRING DIAGRAM CORDING DEVICE EP1.2
FOR EMBROIDERY MACHINE TAJIMA
№ 2003000
Control panel
№ 9013015
Variant 1
Variant 2
Variant 3
Variant 4
Variant 5
Sensor direction of movement № 9010000
№ 9003019
№ 9003018
№ 9003020
№ 9003021
Power source
DRP 480-24
To 220 VAC 3A
sensor, "HWOT 100"
sensor, "Needle 1"
LINE 1
LINE 2
LINE 3
LINE 4
Universal adapter №9040000
variant 1
variant 2
For NC STOP button


Induction sensor, "HWOT 100°" 9020000
15EDGK-3,5-3P
+24v OUT GND
Brown White Green
Shrink tubing
20mm
30mm
12000mm
Electric connecting block DEGSON: DG8HSWP-0-3 9023016
LAPP KABLE, Unitronic LIYY 3x0,34 Catalogue number: 0028403
Brown(+24v) Black Blue(GND)
Induction sensor 9004006
Induction sensor, "Needle N1" 9030000
5000mm
Electric connecting block DEGSON: DG8HSWP-0-3 9033017
Cable for Control panel 2003000
D-SUB 15
Cable for EP1.2 7013014
DEGSON: 15EDGKA-3,5-7P
Green White Gray Yellow Brown
40mm
1200mm
LAPP KABLE, Unitronic FD 5x0,14 Catalogue number: 0027843
DEGSON: 15EDGK-3,5-3P
Gray Yellow Brown White Green
3 GND 2 STO 1 +24v
Optical seensor with cable
15EDGKM-3,5-3P
GND STO +24v
Green White Brown
2000mm
max
LAPP KABLE, Unitronic LIYD 3x0,14 Catalogue number: 73220209
Cable for Optical sensor 9013015
Optical sensor 9010000
Cable for "STOP button" 9003024
NC COM NO
100mm
LAPP KABLE, Unitronic LIYY 3x0,34 Catalogue number: 0028403
WIRING DIAGRAM CORDING DEVICE EP1.2
FOR EMBROIDERY MACHINE TAJIMA

Total Control Panel for EPxx Cording Device (CP)

TOTAL CONTROL PANEL
FOR THE SERIES ZIGZAG_EPxx CORDING DEVICES

Recommended Option
for the Multihead Embroidery Machines

USER GUIDE

Delivery Set

The Total Control Panel (further in the text - TCP) delivery set includes (fig. 1.1):

TCP (1a);
The connecting cable (1b, with a length about 70 cm or 110 cm depending on embroidery machine type);
Adjusting washers (1c) to provide reliable mounting TCP on the cording device housing;
The plastic bracket (1d) to fix the connecting cable on the cording device housing.

Fig. 1.1

Technical Parameters

TCP is intended for use on the ZSK embroidery machines (regardless of the control system type) to control the series ZIGZAG_EPxx cording devices.

Power Supply	24 VDC
Total Current Consumed, not more than	0.1 A
Dimensions, mm	40 x 100 x 100
Weight, g, not more than	400

Arrangement and operating principles

TCP is intended for simultaneous control of all cording devices installed on the embroidery machine. Using TCP the following operations may be carried out:

pulling down the cording device heads into operating position;
disabling/enabling the cording device heads rotation;
lifting up the cording device heads into the trimming position;
lifting up the cording device heads into the top position (for transportation).

Embroidery machine operator may control cording devices using the toggle-switch with three fixed positions (3.1a, fig. 3.1) and the button (3.1b). The 7-segment LED indicator (3.1c) is used to monitor operating conditions.

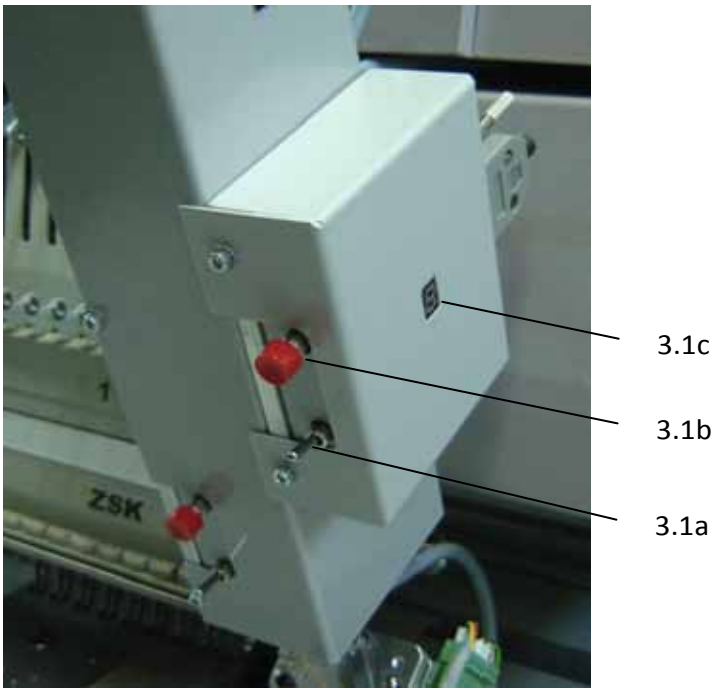


Fig. 3.1

The TCP control is possible when the following conditions are met:

- the corresponding needle is set on the embroidery machine (the #1 needle - for the "right hand" cording device; the #N needle - for the "left hand" ones);
- the main shaft is in the normal stop position (the HWOT signal is equal to zero);
- there is no any head thread break messages (in this case the cording device should be controlled separately according to the User Guide).

All cording devices may be controlled using TCP as well as some devices may be controlled using its own toggle-switches and buttons thus the embroidery machine operator has to follow the rules stated in the table 3.1.

Table 3.1

№	Cording Device Toggle-Switch Position	TCP Toggle-Switch Position	Operating Needle	Cording Device Head Action	Remarks
1	Any position	Any position	Switching to the 2nd, ..., N-1 needle	The cording device heads are automatically lifting up to the top position	When the operating needle is changing and there is no thread breaking message
2	Switching to the top position	Any position	1, N	The cording device head lifts up to the top position. Head operations are disabled	The #1 needle for the "right hand" cording device; the #N needle for the "left hand" one
3	Switching to the bottom position	Any position	1, N	The cording device head pulls down to the bottom (operating) position. When the embroidery machine operates the cording device head rotation is enabled	
4	Switching to the middle position	Any position	1, N	When the embroidery machine operates the cording device head rotation is disabled	Use this mode to fix a thread
5	No switching (the toggle-switch is not in the top position)	Switching to the top position	1, N	All cording device heads are simultaneously lifting up to enable the thread trimming	Use this mode to trim a thread (embroidery design should include the STOP command before the TRIMMING one)
6	No switching (the toggle-switch is not in the top position)	The toggle-switch is in the top position, an operator clicks the button 3.1b	1, N	All cording device heads are simultaneously lifting up to the top position	Use this mode to change a needle
7	No switching (the toggle-switch is not in the top position)	Switching to the bottom position	1, N	All cording device heads are simultaneously pulling down to the bottom position. When the embroidery machine operates the cording device head rotation is enabled	
8	No switching (the toggle-switch is not in the top position)	Switching to the middle position	1, N	When the cording device heads are in the bottom position and the embroidery machine operates the head rotation is disabled	Use this mode to fix a thread

The specified operations are carried out **only when** the TCP or cording device toggle-switch **is being switched**. To disable any cording device its own toggle-switch should be switched to the top position. Such device is not able to receive any TCP command as well as its head will be automatically lifted up to the top position.

Lifting up / pulling down a cording device head is possible in the following cases:

- the embroidery machine is stopped;
- the main shaft is in the normal stop position (the HWOT signal is equal to zero).

In a case of the embroidery machine starts while the cording device heads are lifting up / pulling down

some jump stitch electromagnets will be switched off to avoid operating the corresponding needle bar.

While punching an embroidery design a puncher should follow rules stated in the table 3.2.

Table 3.2

Embroidery Design Commands	**Operator Actions (Embroidery Machine Actions)**
...	
	Switch the TCP / a cording device toggle-switch to the middle position
5-15 thread fixing stitches; the STOP command	(while a machine embroiders the cording device head rotation is disabled)
	Switch the TCP / a cording device toggle-switch to the bottom position
5-10 cord fixing stitches; the STOP command	
	Trim manually an initial tip of a cord
design stitches (cording); the STOP command	
	Switch the TCP toggle-switch to the top position
the TRIMMING command	(an automatic thread trimming in process)
	Trim manually a cord or go to a next embroidery pass drawing a cord
...	

After embroidering an operator should lift up cording device heads by switching the TCP toggle-switch to the top position. There is only position to avoid troubles while changing an operating needle or moving a border frame.

Mounting and electrical installation

Use a cording device connecting cable (1a, with a length about 70 cm or 110 cm depending on embroidery machine type) to connect TCP to free socket X3 or X4 of any embroidery head commutation unit KSP-10 (fig. 4.1). Fix a cable with a screw on an embroidery head housing using a plastic bracket (1d, fig. 4.2).

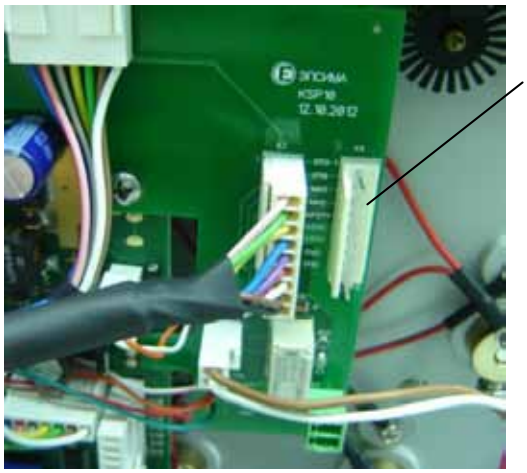


Fig. 4.1

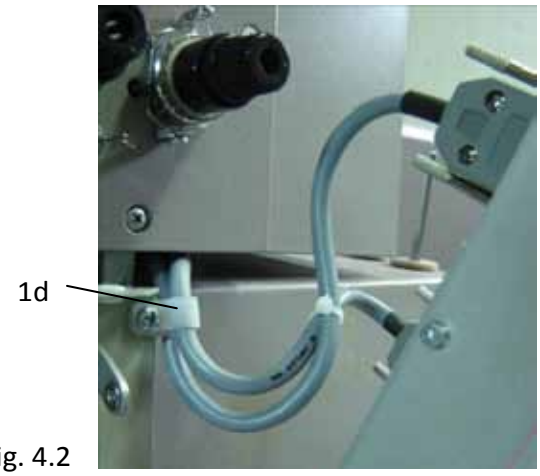


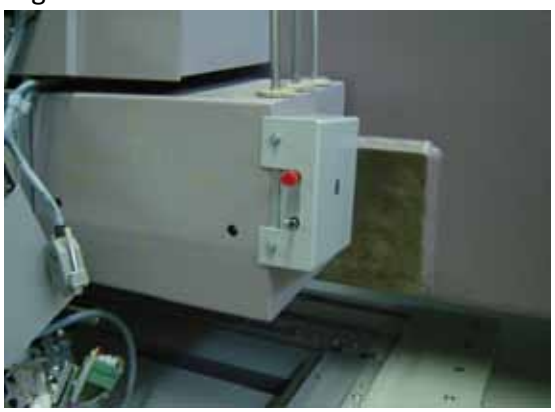
Fig. 4.2

TCP may be mounted on any cording device housing with magnets set on a case of TCP (fig. 4.3). To provide reliability of mounting it is recommended to fix washers from the delivery set (1c, fig. 4.4). If these ones are excluded, TCP may be mounted on any embroidery machine metal part. In this case be sure the cable length is enough to provide reliable connection (fig. 4.5).

Fig. 4.3

Fig. 4.4

Fig. 4.5



There are no restrictions on number of TCPs which can be installed on the embroidery machine.

Testing Totol Control Panel (CP)

Use the 7-segment LED indicator (3.1c) to test TCP (fig. 5.1). When a toggle-switch is switched to the top, middle or bottom position a corresponding «A», «G» or «D» segment (fig. 5.1) is highlighted for some time. If a toggle-switch is switched to the top position and a 3.1b button is pressed an «A» segment is highlighted too.

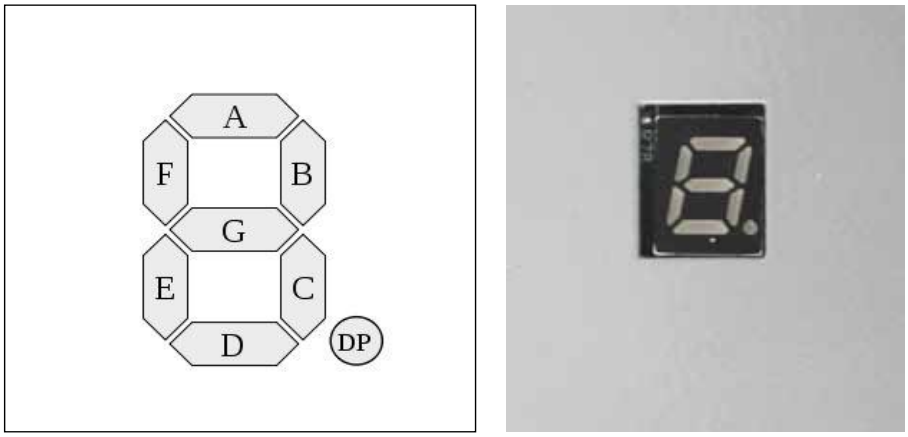
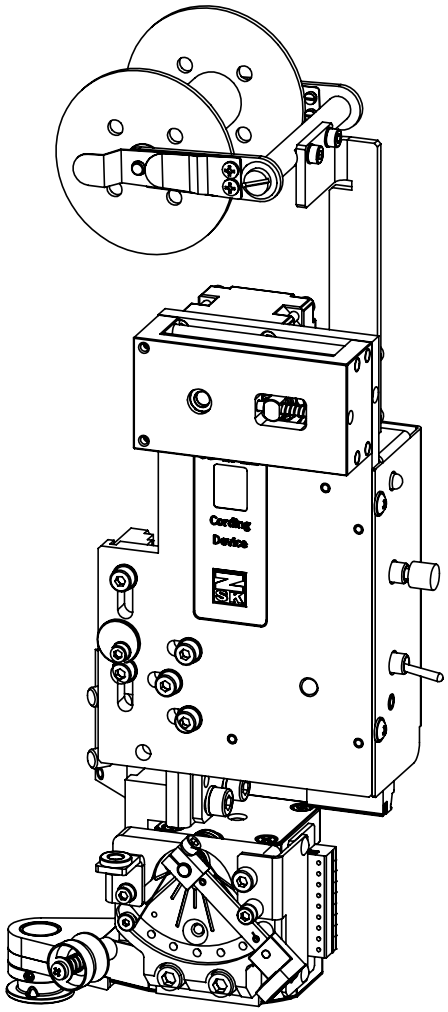


Fig. 5.1

Part List for Cording Device EP1.2

Cording Device EP1.2



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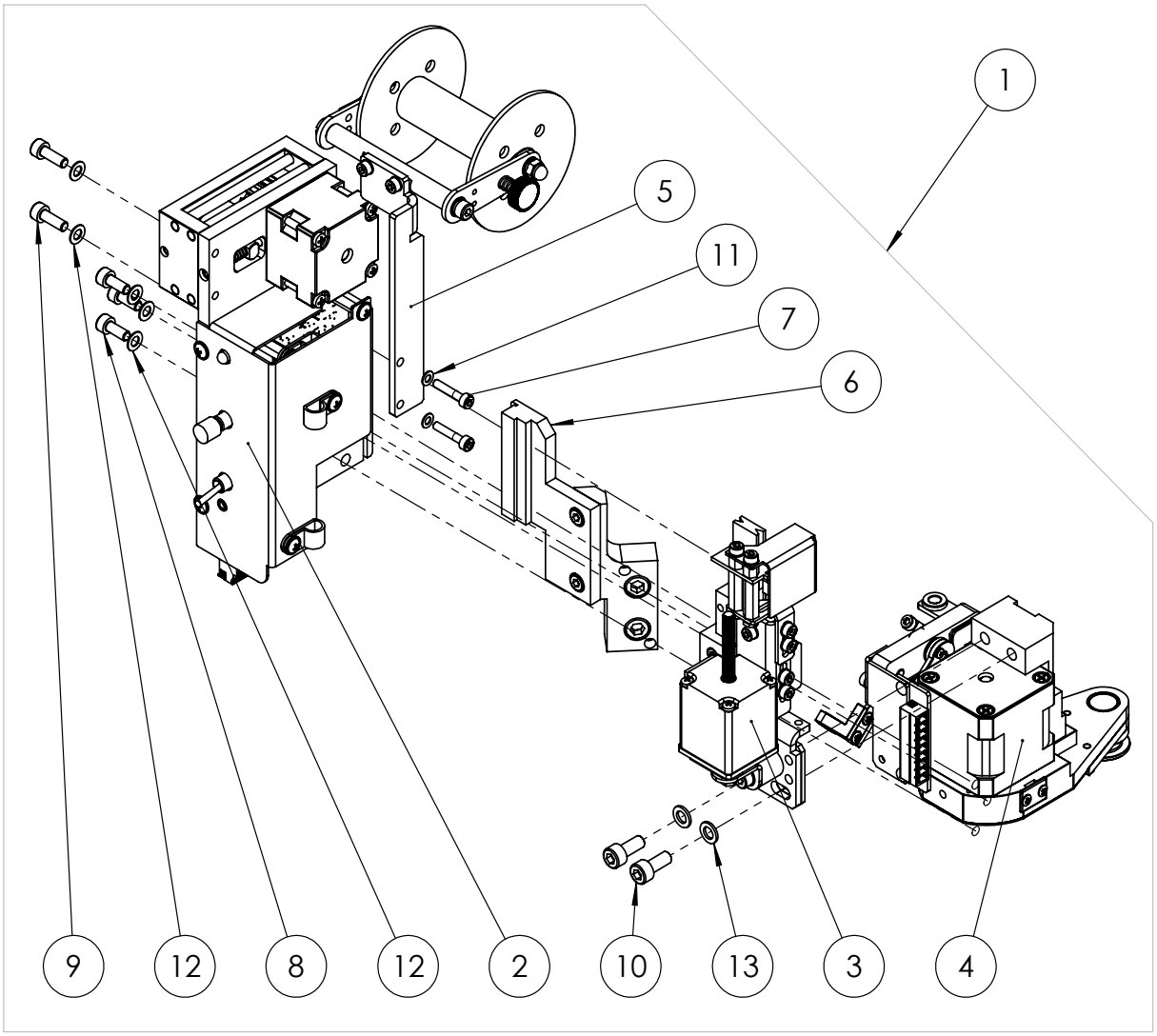
Cording Device EP1.2



ITEM NO.	DESCRIPTION	PART NUMBER	QTY.
1	Cording Device EP1-R (Right)	700 0000	1
2	Control Unit (Assembly)	701 0000	1
3	Lifting Unit (Assembly)	403 0000	1
4	Cording Head (Assembly)	703 0000	1
5	Bobbin Holder (Assembly)	704 0000	1
6	Mounting Unit (Assembly)	705 0000	1
7	Hexagon Socket Head Cap Screw M3x16 DIN 912	000 2061	5
8	Hexagon Socket Head Cap Screw M4x10 DIN 912	000 2006	3
9	Hexagon Socket Head Cap Screw M4x12 DIN 912	000 2005	2
10	Hexagon Socket Head Cap Screw M5x12 DIN 912	000 2025	2
11	Plain Washer Small 3.2 DIN 433	000 2009	2
12	Plain Washer Small 4.3 DIN 433	000 2007	2
13	Plain Washer Small 5.3 DIN 433	000 2026	2

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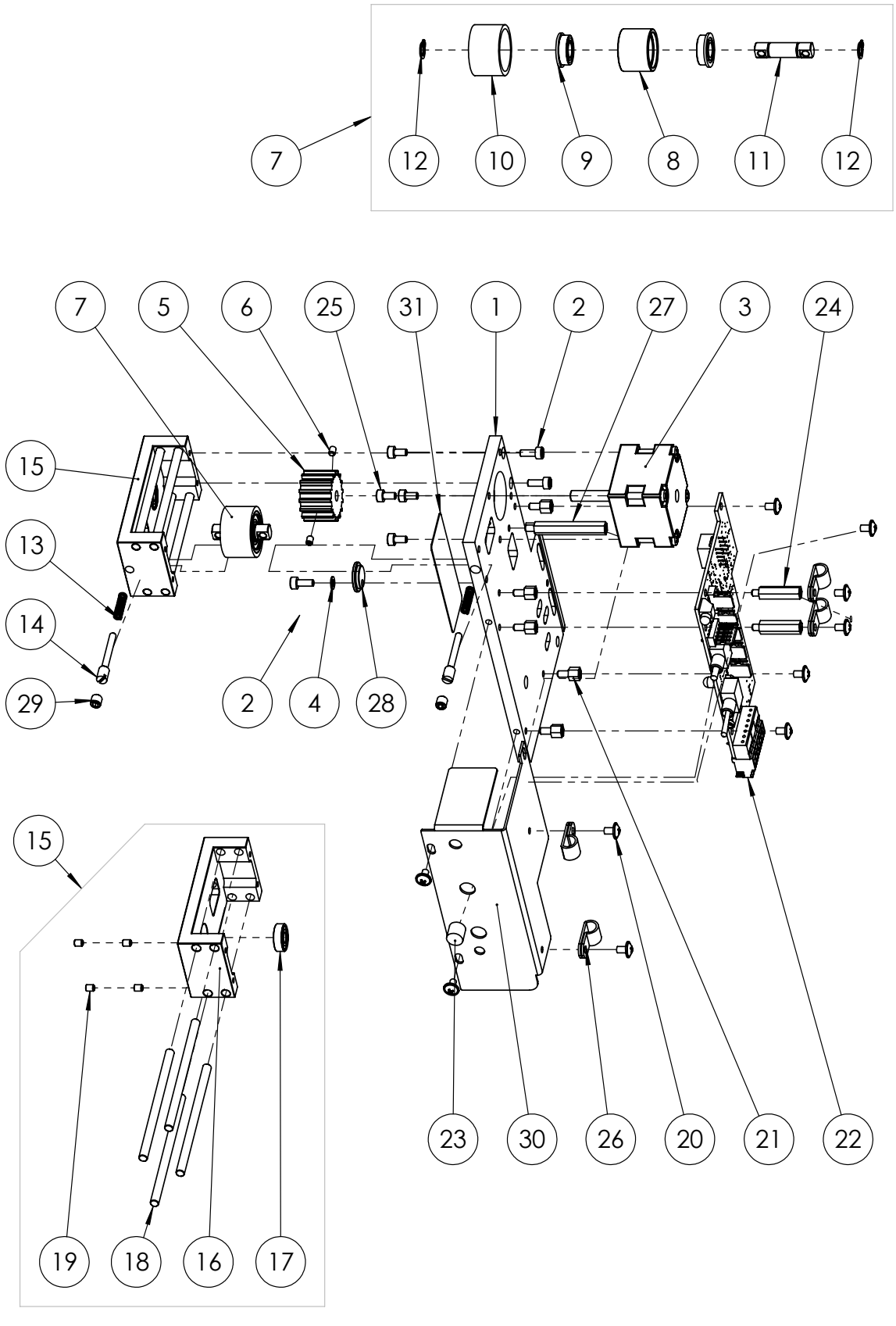
EP1.2 Control Unit



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EP1.2 Control Unit

ITEM NO.	DESCRIPTION	PART NUMBER	QTY.
1	Body Plate	701 1042	1
2	Hexagon Socket Head Cap Screw M3x8 DIN 912	000 2008	3
3	Cord Feeder Motor	701 4003	1
4	Plain Washer Small 3.2 DIN 433	000 2009	1
5	Cord Feeder Gear	701 2077	1
6	Hexagon Socket Set Screw Flat Point M3x4 DIN 913	000 2081	2
7	Cord Feeder Roller (Assembly)	701 2076	1
8	Bearing Bushing	701 2120	1
9	Miniature Radial Ball Bearings	701 2119	2
10	Rubber Cover	701 2121	1
11	Feeder Roller Axle	701 2122	1
12	Circlips for shaft Type A Small 6 GB/T894.1-1986	701 2123	2
13	Spring D5x10	701 2079	2
14	Cord Feeder Axle	701 2078	2
15	Cord Feeder Body (Assembly)	701 2124	1
16	Cord Feeder Body	701 2075	1
17	Angular Contact Ball Bearing	701 2083	1
18	Cord Guide Axle	701 2080	4
19	Hexagon Socket Set Screw Flat Point M3x4 DIN 913	000 2081	4
20	Hexagon Socket Set Screw Flat Point M5x5 DIN 913	000 2082	10
21	Standoff 5.5xM3x5x6	000 2004	5
22	Cord Device Mini ver.5 PCB-A	701 3006	1
23	Button Plastic Cap Red	701 2125	1
24	Standoff 5.5xM3x20x4	000 2003	2
25	Pan Head Cross Recess Collar Screw M3x5 DIN 967	000 2017	4
26	R-Type Cable Clip	000 2001	4
27	Standoff 5.5xM3x35x5	000 2002	1
28	Eccentric	401 1002	1
29	Hexagon Socket Set Screw Flat Point M5x5 DIN 913	000 2082	2
30	Cover	701 1043	1
31	Label EP1.2	701 1044	1
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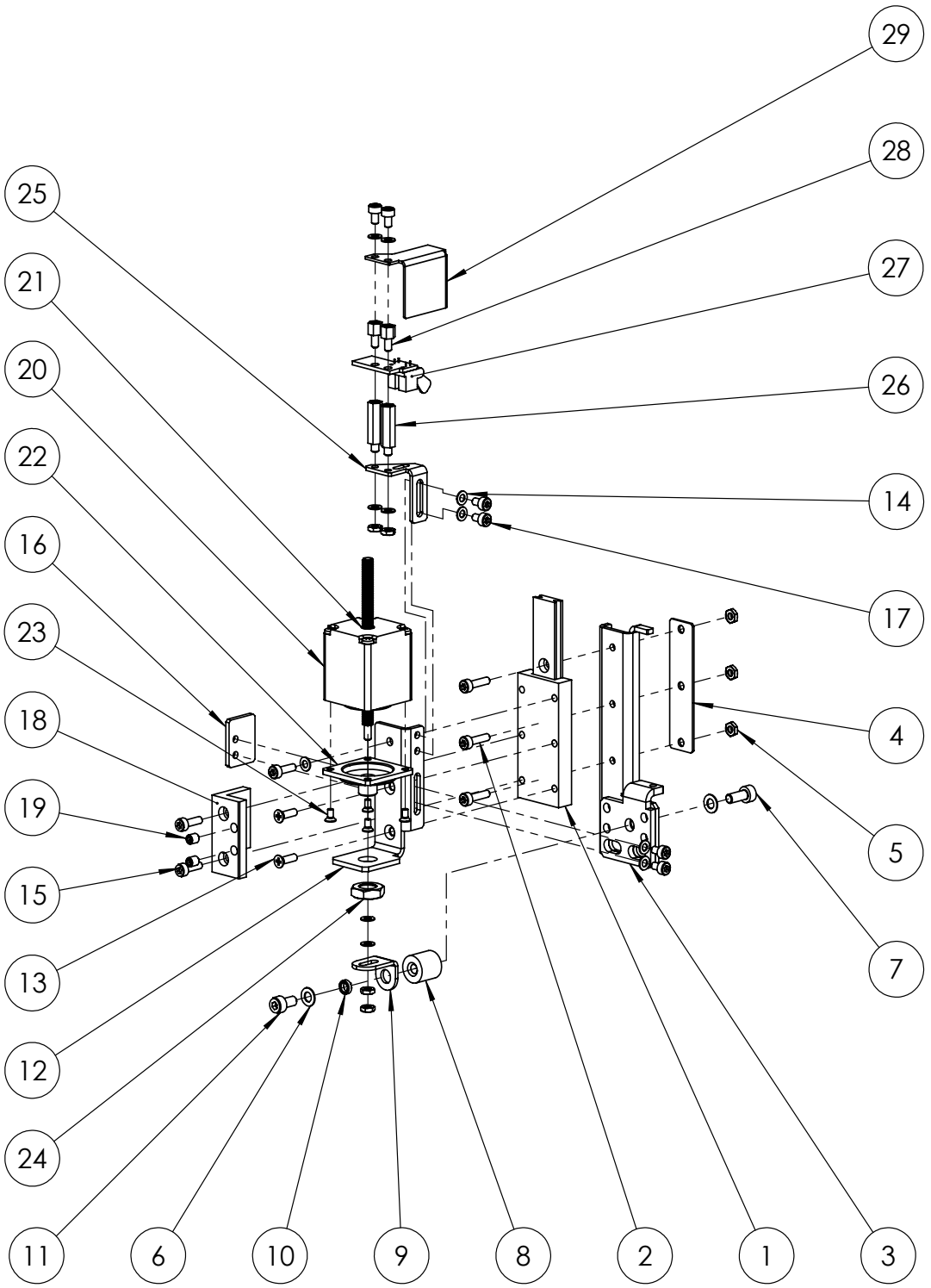
EP1.2 Lifting Unit



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EP1.2 Lifting Unit

ITEM NO.	DESCRIPTION	PART NUMBER	QTY.
1	Linear Bearing	403 2033	1
2	Hexagon Socket Head Cap Screw M3x12 DIN 912	000 2021	3
3	Channel Bar	403 1010	1
4	Plate 1mm	403 1011	1
5	Chamfered Hexagon Thin Nut M3 DIN EN 24035	000 2024	7
6	Plain Washer Small 4.3 DIN 433	000 2007	2
7	Hexagon Socket Head Cap Screw M4x10 DIN 912	000 2006	1
8	Standoff 12mm	403 1018	1
9	Ear Corner	403 1017	1
10	Spacer Sleeve	403 1016	1
11	Hexagon Socket Head Cap Screw M4x8 DIN 912	000 2012	1
12	Mounting Bracket	403 1008	1
13	Countersunk Flat Head Cross Recess Screww M3x10 ISO 7046-1	000 2022	2
14	Plain Washer Small 3.2 DIN 433	000 2009	11
15	Hexagon Socket Head Cap Screw M3x10 DIN 912	000 2020	3
16	Detend	403 1013	1
17	Hexagon Socket Head Cap Screw M3x5 DIN 912	000 2017	6
18	Corner	403 1012	1
19	Hexagon Socket Set Screw Flat Point M4x6 DIN 913	000 2015	2
20	Linear Actuator	403 4001	1
21	Screw Shaft	403 2126	1
22	Motor Retainer	403 1009	1
23	Countersunk Flat Head Cross Recess Screww M2.5x5 ISO 7046-1	000 2019	4
24	Chamfered Hexagon Thin Nut M8x1 DIN EN 24035	000 2027	1
25	Regulating Corner	403 1014	1
26	Standoff 5.5xM3x18x6	000 2016	2
27	High Limit Sensor PCB-A	403 3003	1
28	Standoff 5.5xM3x5x6	000 2004	2
29	Protective Cover	403 1015	1
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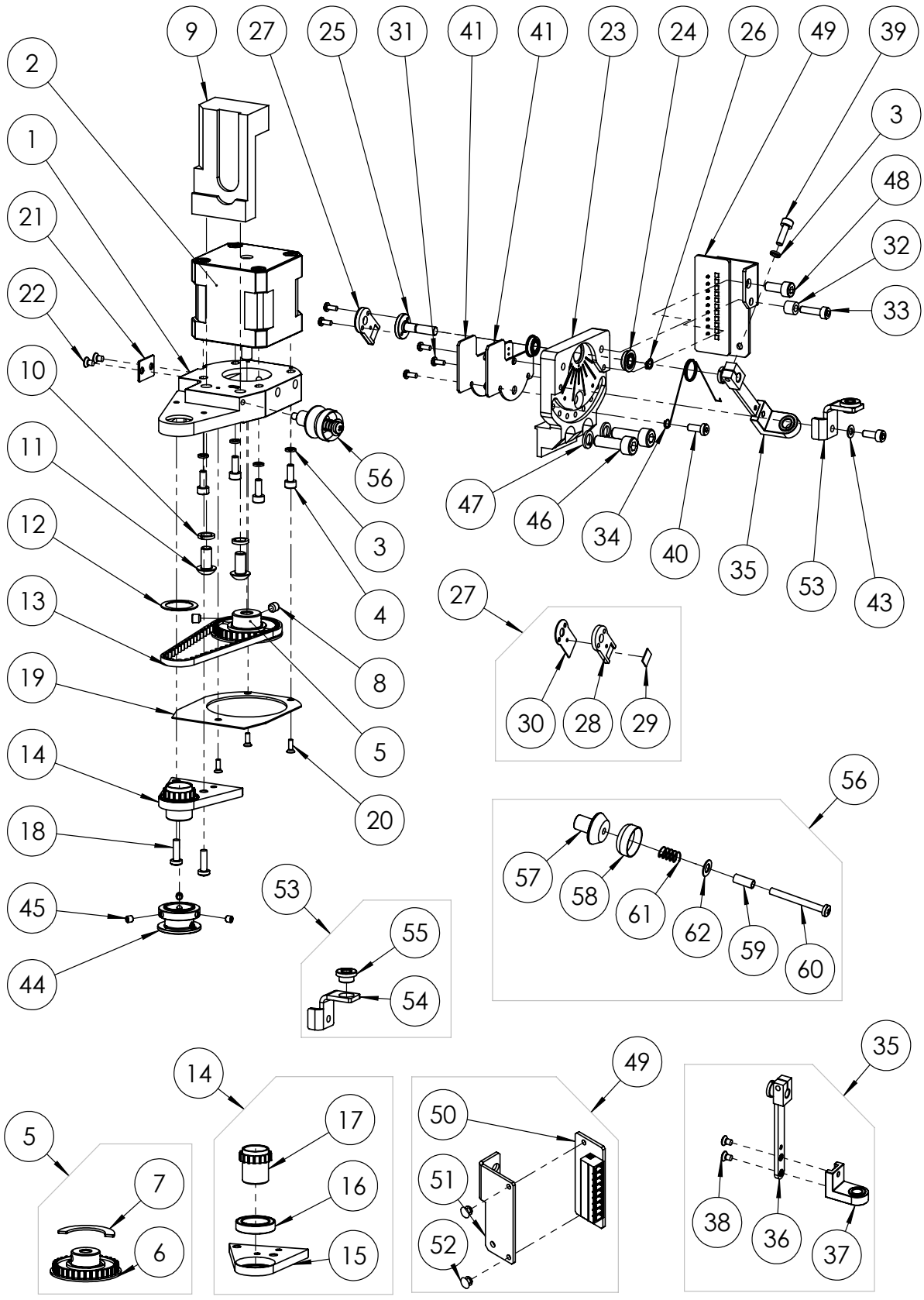
EP1.2 Cording Head



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EP1.2 Cording Head

ITEM NO.	DESCRIPTION	PART NUMBER	QTY.
1	Cording Head Baseplate Assembly	703 2090	1
2	Cording Head Step Motor	703 4004	1
3	Single Coil Spring Lock Washer 3 DIN 127	000 2094	5
4	Hexagon Socket Head Cap Screw M3x8 DIN 912	000 2008	5
5	Plastic Gear Assembly	703 2067	1
6	Plastic Gear Subassembly	703 2092	1
7	U-type Magnet	703 2093	1
8	Hexagon Socket Set Screw Flat Point M4x4 DIN 913	000 2127	2
9	Cording Head Attachment (ZSK)	703 1040	1
10	Single Coil Spring Lock Washer 5 DIN 127	000 2095	2
11	Hexagon Socket Button Head Screw M5x10 ISO 7380	000 2025	2
12	Nylon Washer	703 2096	1
13	Cording Head Belt	703 2066	1
14	Bearing Plate Assembly	703 2068	1
15	Bearing Plate	703 2097	1
16	Extra Thin Bal Bearing	703 2098	1
17	Gear Bushing	703 2099	1
18	Pan Head Cross Recess Screw M3x10 ISO 7045	000 2094	2
19	Cording Head Cover	703 2070	1
20	Countersunk Flat Head Cross Recess Screw M2x6 ISO 7046-1	000 2072	3
21	Sensor Plate	703 2100	1
22	Countersunk Raised Head Cross Recess Screw M2.5x4 ISO 7047	000 2111	2
23	Cord Guide Baseplate	703 2101	1
24	Miniature Radial Ball Bearing With Flanged Outer Ring	703 2128	2
25	Magnet Axle	703 2102	1
26	Circlip For Shaft 4 GB/T 894.1-1986	000 2103	1
27	Magnet Holder Assembly	703 2102	1
28	Magnet Body	703 2104	1
29	Magnet 5x7	703 2103	1
30	Magnet Cover	703 2105	1
31	Pan Head Cross Recess Screw (Brass) M2x5 ISO 7045	000 2106	5
32	Rubber Bushing	703 2107	1
33	Hexagon Socket Head Cap Screw M3x12 DIN 912	000 2021	1
34	Rocker Spring	703 2108	1
35	Cord Guide Rocker Assembly	703 2005	1
36	Cord Guide Rocker	703 2109	1
37	Cord Guide Plastic Corner Assembly	703 2110	1
38	Countersunk Raised Head Cross Recess Screw M2.5x4 ISO 7047	000 2111	2
39	Hexagon Socket Head Cap Screw M3x10 DIN 912	000 2020	1
40	Hexagon Socket Head Thin Cap Screw M3x8-5.5 DIN 7984	000 2008	1
41	Amplifier Hall Sensor PCB Spacer	703 3010	1
42	Amplifier Hall Sensor PCB-A	703 3009	1

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EP1.2 Cording Head

ITEM NO.	DESCRIPTION	PART NUMBER	QTY.
43	Plain Washer Small 3.2 DIN 433	000 2009	1
44	Cord Guide Coil 10.5mm	703 2069	1
45	Hexagon Socket Set Screw Flat Point M3x3 DIN 913	000 2074	3
46	Hexagon Socket Head Cap Screw M5x16 DIN 912	703 2129	2
47	Hexagon Socket Head Cap Screw 5 DIN 127	000 2095	2
48	Hexagon Socket Head Cap Screw M4x10 DIN 912	000 2006	1
49	Connector PCB Plate Assembly	703 3012	1
50	Connector PCB-A	703 3011	1
51	Connector PCB Baseplate	703 1045	1
52	Rivet (Mushroom Head) 2.5x6 DIN 674	000 2112	2
53	Cord Guide Assembly	703 1070	1
54	Cord Guide	703 1041	1
55	Ceramic Eyelet	703 2064	1
56	Cord Fastening Assembly	703 2071	1
57	Cord Fastening Standoff	703 2113	1
58	Cord Fastening Cap	703 2114	1
59	Cord Fastening Plug	703 2115	1
60	Pan Head Cross Recess Screw M3x30-25 ISO 7045	0002116	1
61	Spring d5x10mm	703 2117	1
62	Plain Washer Small 4.3 DIN 433	000 2009	1
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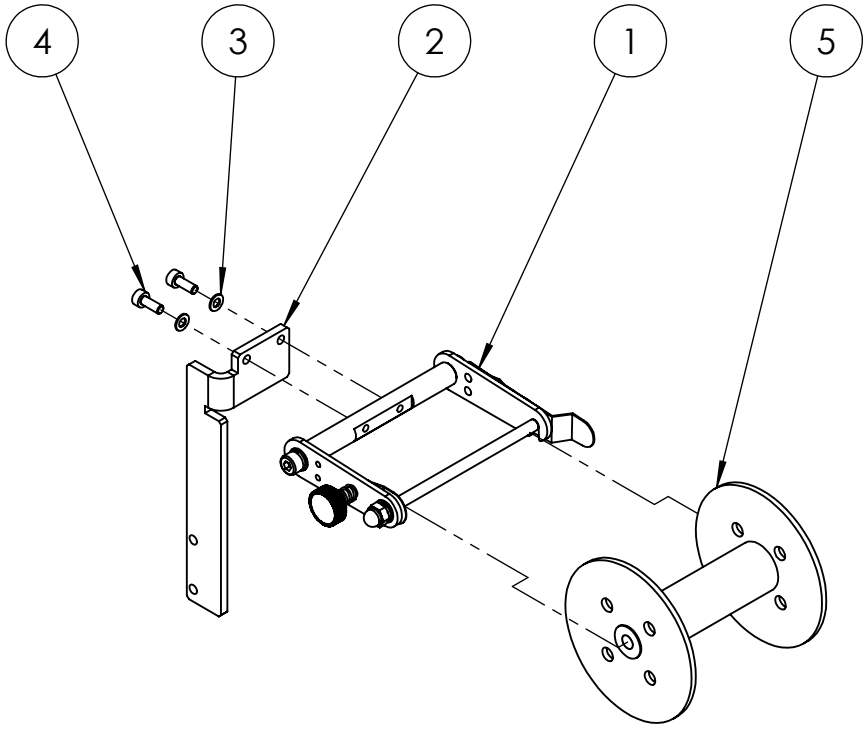

ITEM NO.	DESCRIPTION	PART NUMBER	QTY.
1	Bobbin Holder Assembly	704 2059	1
2	Bobbin Holder Attachment	704 1039	1
3	Plain Washer Small Series 3.2 DIN 433	000 2009	2
4	Hexagon Socket Head Cap Screw M3x8 DIN 912	000 2008	2
5	Cord Bobbin	704 2060	1

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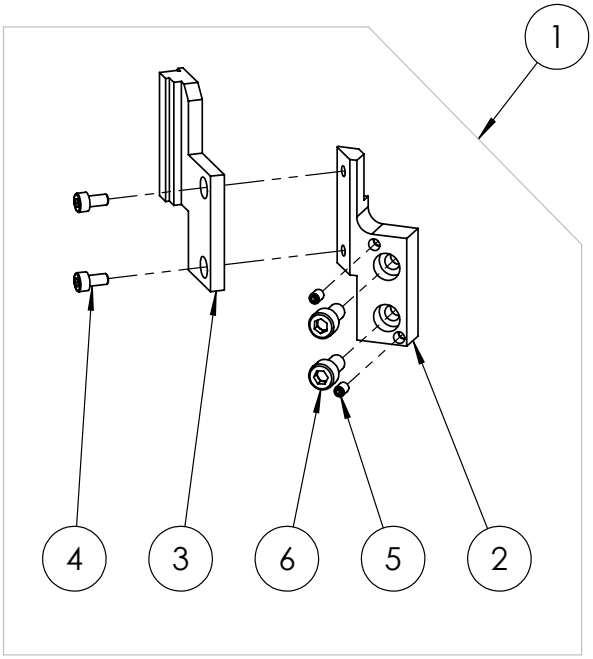
EP1.2 Mounting Unit (ZSK)



ITEM NO.	DESCRIPTION	PART NUMBER	QTY.
1	Mounting Unit (ZSK) Assembly	705 0000	1
2	Cording Device Attachment	705 1038	1
3	10mm Adapter	402 1005	1
4	Hexagon Socket Head Cap Screw M4x8 DIN 912	000 2012	2
5	Hexagon Socket Set Screw Flat Point M4x6 DIN 913	000 2015	2
6	Hexagon Socket Head Cap Screw M6x12 DIN 912	000 2013	2

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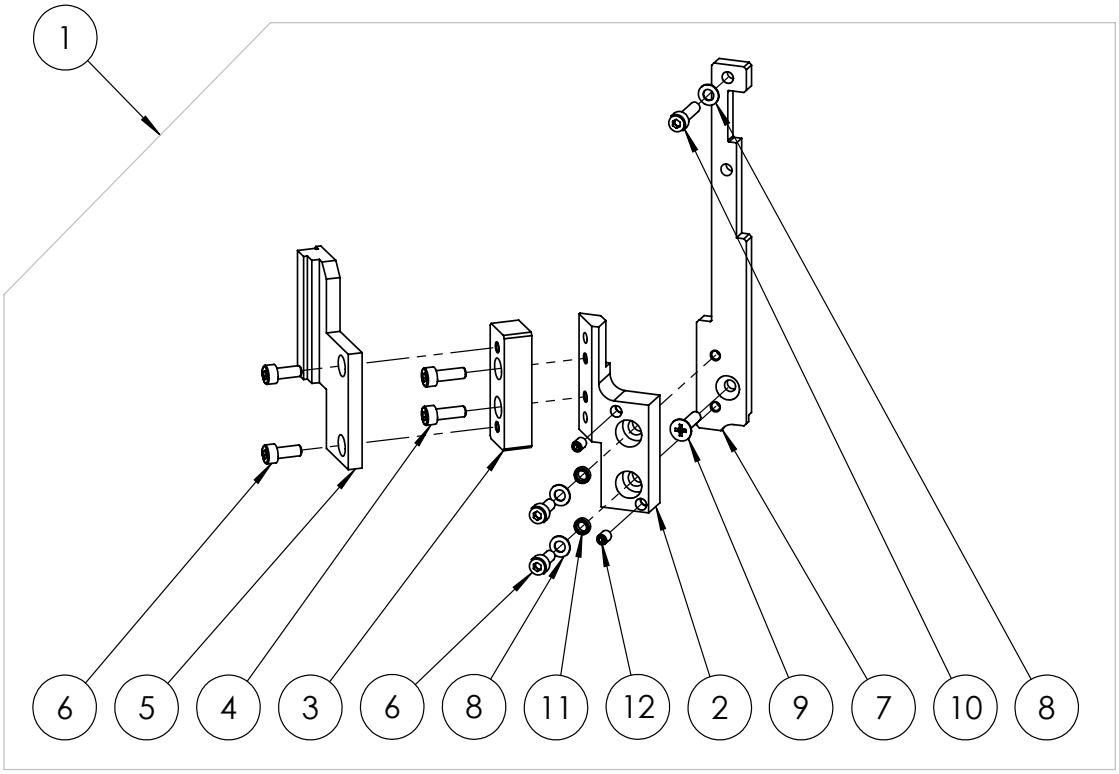
EP1.2 Mounting Unit (Tajima)



ITEM NO.	DESCRIPTION	PART NUMBER	QTY.
1	Mounting Unit (Tajima) Assembly	706 0000	1
2	Cording Device Attachment	705 1038	1
3	12mm Spacer Plate	706 1048	1
4	Hexagon Socket Head Cap Screw M4x12 DIN 912	000 2005	2
5	10mm Adapter	402 1005	1
6	Hexagon Socket Head Cap Screw M4x10 DIN 912	000 2006	4
7	Attachment Plate (Tajima)	706 1047	1
8	Plain Washer Small Series Grade A 4.3 DIN 433	000 2007	3
9	Hexagon Socket Head Cap Screw M4x16 DIN 912	000 2029	1
10	Countersunk Flat Head Cross Recess Screw M4x16 ISO 7046-1	000 2085	1
11	Spacer Sleeve	403 1016	2
12	Hexagon Socket Set Screw Flat Point M4x6 DIN 913	000 2015	2

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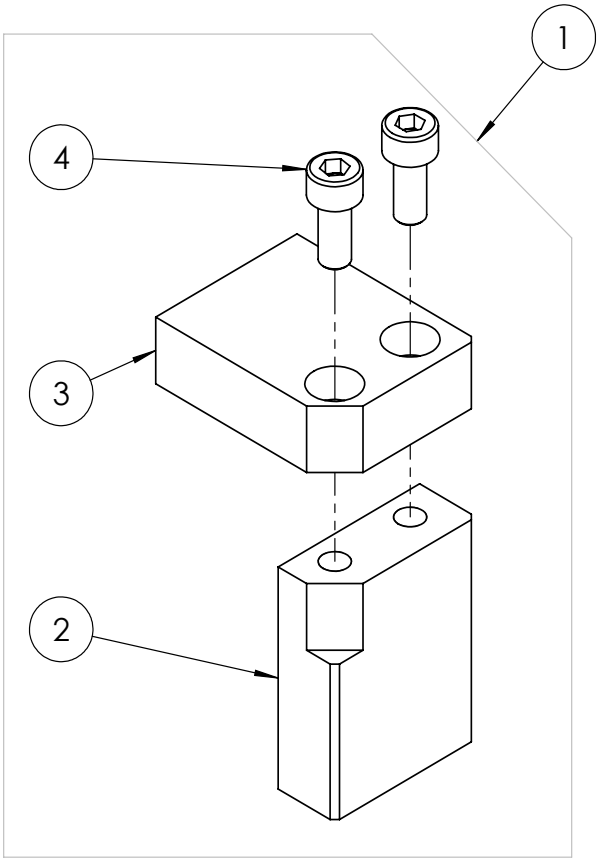
Cording Head Attachment (Tajima)



ITEM NO.	DESCRIPTION	PART NUMBER	QTY.
1	Cording Head Attachment (Tajima) Assembly	707 0000	1
2	Cording Head Attachment (Tajima)	707 1049	1
3	12mm Plate (Tajima)	707 1050	1
4	Hexagon Socket Head Cap Screw M5x12 DIN 912	000 2025	2

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MADE
IN
GERMANY

ZSK Stickmaschinen GmbH
Magdeburger Str. 38-40
47800 Krefeld
Germany

Fon: +49-(0)2151-444-0
Fax: +49-(0)2151-444-170

Email: zsk@zsk.de
Online: www.zsk.de

www.facebook.com/ZSK.Stickmaschinen

www.youtube.com/zskfilm