SERVO-TOP

QE5542

CE

# Type

# PE31SE

## Instruction Manual

## Part 3

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**English 2000-11-30**

# Contents

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## Part 3



**Technical updatings reserved!**

# 11. Survey and List of Parameters

## 11.1 Explanation of Parameter Survey

The parameter survey is designed as an aid for finding parameters quickly. It is a summary of references for the parameter list. Listed behind each reference are all parameters which exert an influence on the function described by the reference.

The parameter survey is divided into five columns:
Column 1 shows the references (functions) to which parameters are assigned.
Column 2 shows the abbreviations of the respective functions.
Column 3 shows all parameters (setting numbers) belonging to the respective reference.
Column 4 shows, for each function (reference) which controls inputs or outputs, the applicable indications such as Ex or Ax which can also be found on the connections diagram.
Column 5 shows, for each function (control inputs (Ex) or control outputs (Ax)), the respective plugs with the number of contacts (see connections diagram).

Example for searching a parameter:
Keyword (function): inverse rotation
The parameter survey shows in column 3 the parameter numbers 618, 623, 801.

Suppose that the inverse rotation function is to be enabled. The parameter list shows this function under parameter number 618.

## 11.2 Explanation of Parameter List

The parameter list is divided into 5 columns. These comprise, in

column 1: the parameter number,
column 2: is the explanation (meaning) of the parameters and the coding system of row 1 of the keys of the mini operator's panel, used when the parameter concerned can be programmed with the mini operator's panel,
column 3: the programming level (A, B, C) on which the parameter in question can be accessed,
column 4: the range of values within which the parameter in question can be set,
column 5: the value of the parameter in question is set on delivery ex factory.

Parameters having "either/or" validity (software switches) can merely be set to value I or II. In the case of such parameters, column 4 is empty.

## 11.3 Parameter survey PE31SE (2a_Q01_5.EN)

| Function | Abbrev'n | Parameter | Input Output | Connection Socket/Contacts |
|---|---|---|---|---|
| Accelerate | DRZAN | 722 | | |
| Backtack | RIE | 107/110 | | |
| Backtack inversion | RIV | 419 | | |
| Backtack suppression | RIUNT | 419 | | |
| Blower | BLA | 668 | | |
| Brake | DRZAB | 723/758/851 | | |
| Chaining-off finger | KEFI | 215/216/217 | | |
| Chainstitch machine | KES | 765 | | |
| Control | REG | 758/884/885 886/887/889 890/891/894 | | |
| Delay | VERZ | 189/190/216 217/623/641 716/717/730 765/779 | | |
| Direction of rotation | DRR | 800 | | |
| End backtack | ER | 110 | | |
| Feed reverse | TUM | 721 | | |
| Front backtack | AR | 105/106/107 | | |
| Hardware test | HWT | 797 | | |
| Inverse rotation | RDR | 618/623/714 801 | | |
| Machine class | MAKL | 799 | | |
| Needle position | NAPO | 675/700/701 702/703 | | |
| Needle position change-over | NPW | 616 | E2 | X10:2 |
| Needle up without trimming | NHOS | 616 | E2 | X10:2 |
| Photocell | LS | 111/112/113 199/615/640 641 | | |
| Presser foot | PF | 633/651/719 729/730 | E4 | X5:2 |
| Program | PR | 114/206/851 | | |
| Programming level C | EBC | 798 | | |

| | | | | |
|---|---|---|---|---|
| Residual brake | STBR | 718 | | |
| Safety switch no run | ANLSP | 619/665 | | |
| Seam end | NE | 114/145/206<br>602 | | |
| Soft start | SANL | 116/117 | | |
| Speed | DRZ | 105/106/107<br>110/117/199<br>605/606/607<br>608/609/676<br>850 | | |
| Speed decrease | DRZAB | 723/758/851 | | |
| Speed increase | DRZAN | 722 | | |
| Start | START | 113/603/640<br>641 | | |
| Start delay | STVERZ | 729 | | |
| Stitch condensation | STVD | 105/106/107<br>110/419 | E1<br>A5 | X10:3<br>X1:2 |
| Stop | STOP | 114/206/619<br>665 | E6 | X8:2 |
| Thread monitor | FW | 141/620 | | |
| Thread tension release | FSL | 636/749/779 | A9 | X1:1 |
| Thread trimming | SN | 580/601/609<br>619/633/714<br>717/765 | | |
| Thread wiper | WI | 668/715/716 | A3 | X1:7 |
| Time needed to switch on | EINZ | 714/715/749<br>889 | | |
| Timing output | TA | 719/721 | | |
| Unlocking of chain | ENTKET | 425 | | |

## 11.4 List of Parameters PE31SE (2a_Q01_5.EN)

<799> = 1 normaler Funktionsablauf
<799> = 2 Ablauf mit Kettelfingersteuerung
<799> = 3 Ablauf mit Verknotungsstich (Stitch lock)

| No. | Function (Meaning) | Level | Range of Values | Standard Value |
|---|---|---|---|---|
| 105 | (AR/DRZ/STVD) Speed for front backtack/stitch condensation<br>(11000000) | B,C | 100-6400 | 1200 |
| 106 | (AR/DRZ/STVD) Speed for front backtack/stitch condensation<br>I variable (treadle-controlled)<br>II constant (corresponding to <105>) | B,C | | II Kl. 1, 3<br>- Kl. 2 |
| 107 | (AR/RIE/DRZ/STVD) Speed for front backtack/stitch condensation when <106> = I<br>I limited by <105><br>II limited by <607> | B,C | | I Kl. 1, 3<br>- Kl. 2 |
| 110 | (ER/RIE/DRZ/STVD) Speed for end backtack/stitch condensation<br>(01100000) | B,C | 100-6400 | 1200 Kl. 1, 3<br>- Kl. 2 |
| 111 | (LS) Photocell compensation stitches<br>(number of stitches from photocell clear to seam end) | A,B,C | 1-255 | 6 |
| 112 | (LS) Number of stitches for photocell fade-out on knit fabrics<br>(number of stitches, according to stitch size) | A,B,C | 0-255 | 0 |
| 113 | (LS/START) Start with photocell<br>I when photocell is dark only<br>II also when photocell is clear | B,C | | II |
| 114 | (PR/STOP/NE) Stop before seam end after stitch count (last seam section)<br>I yes<br>II no | B,C | | II |
| 116 | (SANL) Soft start stitches<br>(11100000) | A,B,C | 0-255 | 0 |
| 117 | (SANL/DRZ) Speed for soft start stitches<br>(00010000) | B,C | 30-640 | 500 |
| 141 | (FW) Number of stitches until bobbin thread monitor signal becomes active<br>(signal suppression on bobbin thread monitor) | B,C | 0-255 | 10 |
| 145 | (NE) Number of stitches for seam end | A,B,C | 0-255 | 3 Kl. 1<br>0 Kl. 3<br>- Kl. 2 |
| 189 | (VERZ) Delay t1 | B,C | 0-2550 | 70 Kl. 3<br>- Kl. 1, 2 |
| 190 | (VERZ) Delay t2 | B,C | 0-2550 | 10 Kl. 3<br>- Kl. 1, 2 |
| 199 | (DRZ/LS) Speed for photocell compensation stitches | B,C | 300-6400 | 1200 |

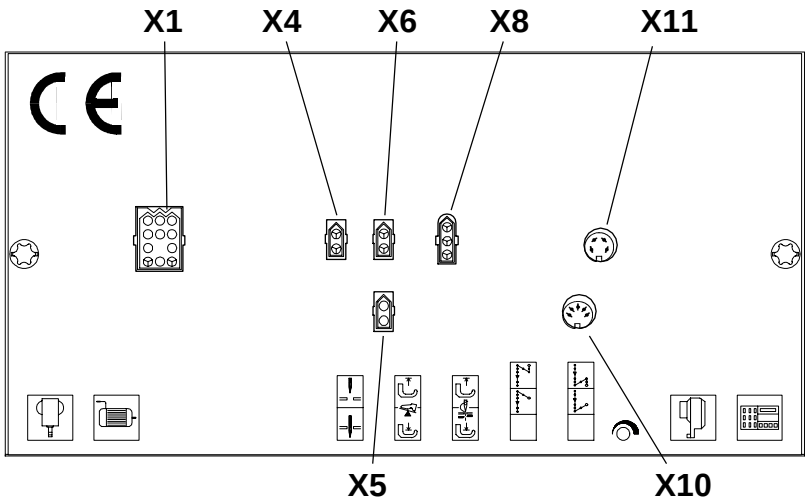
| | | | | | |
|---|---|---|---|---|---|
| 206 | (NE/PR/STOP) Interrupt/discontinue seam sections at speed = constant (<203> = II)<br>I with treadle -2<br>II with treadle 0 | B,C | | II<br>- | Kl. 1, 3<br>Kl. 2 |
| 215 | (KEFI) Number of stitches for chaining-off finger | A,B,C | 0-255 | 5<br>- | Kl. 2<br>Kl. 1, 3 |
| 216 | (KEFI/VERZ) Delay in start-up time (ms) for chaining-off finger | B,C | 0-2550 | 200<br>- | Kl. 2<br>Kl. 1, 3 |
| 217 | (KEFI/VERZ) Speed release (ms) after chaining-off finger off | B,C | 0-2550 | 100<br>- | Kl. 2<br>Kl. 1, 3 |
| 419 | (RIV/RIUNT/STVD) Function of external key<br>I backtack/stitch condensation inversion<br>II backtack/stitch condensation suppression (flip-flop function) | B,C | | I<br>- | Kl. 1, 3<br>Kl. 2 |
| 425 | (ENTKET) Unlocking of chain at seam end<br>I yes<br>II no | A,B,C | | II | |
| 580 | (SN) I Upper thread trimmer in position 1<br>II Upper and lower thread trimmer in position 2 | B,C | | II<br>- | Kl. 1, 2<br>Kl. 3 |
| 601 | (SN) Trimming<br>I yes<br>II no<br>(00001000) | B,C | | I | |
| 602 | (NE) Seam end at treadle position<br>I slightly heeled (-1)<br>II fully heeled (-2) | B,C | | II | |
| 603 | (START) Start after seam end<br>I after treadle 0 only<br>II immediate start of operation | B,C | | I | |
| 605 | (DRZ) Actual speed in display<br>I yes<br>II no | B,C | | II | |
| 606 | (DRZ) Speed: level 1 (min.)<br>(10001000) | B,C | 30-640 | 200 | |
| 607 | (DRZ) Speed: level 12 (max.)<br>(01001000) | B,C | 100-10000 | 4000 | |
| 608 | (DRZ) Speed level curve (treadle characteristic)<br>I linear<br>II not linear | B,C | | I | |
| 609 | (SN/DRZ) Trimming speed 1<br>(11001000) | B,C | 30-300 | 200 | |
| 615 | (LS) End recognition when photocell goes<br>I from light to dark<br>II from dark to light | B,C | | II | |
| 616 | (NPW/NHOS) Function of external key (input E2)<br>I needle position change-over (NPW)<br>II needle up without trimming (NHOS) | B,C | | II | |
| 618 | (RDR) Inverse rotation after seam end<br>I yes<br>II no<br>(00101000) | B,C | | II | |

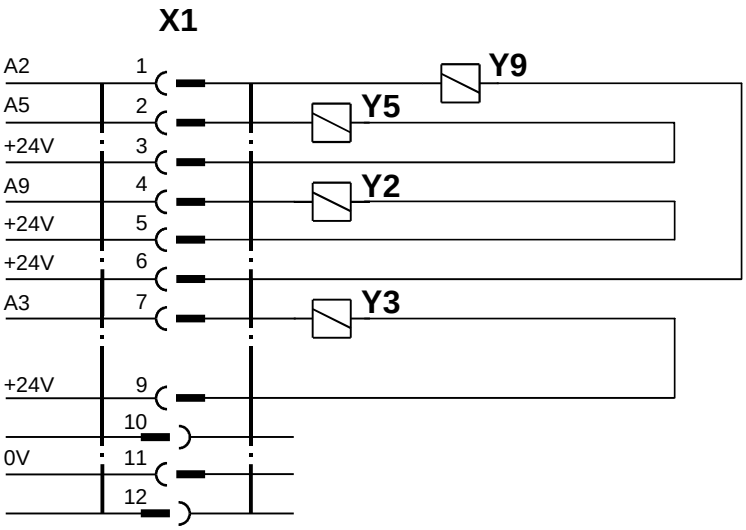
| | | | | |
|---|---|---|---|---|
| 619 | (SN/ANLSP/STOP) Control of thread trimming (safety switch no run)<br>I yes<br>II no | B,C | | II |
| 620 | (FW) Thread monitor function<br>I yes<br>II no | B,C | | II |
| 623 | (RDR/VERZ) Delay in start-up time (ms) for inverse rotation | B,C | 0-2550 | 10 |
| 633 | (SN/PF) Trimming and presser foot<br>I with treadle „-2“ only (<602> = II)<br>II corresponding to <602> | B,C | | II |
| 636 | (FSL) Thread tension release<br>I yes<br>II no | B,C | | I |
| 640 | (LS/START) Start possible by obscuring the photo-cell (if existing, note parameter 113!)<br>I yes<br>II no | B,C | | II |
| 641 | (LS/START/VERZ) Delay before start (ms) after photocell (at <640> = I) | B,C | 0-2550 | 150 |
| 651 | (PF) Presser foot with automatic descent on machine stop<br>I yes<br>II no | B,C | | I |
| 665 | (ANLSP/STOP) Run locking/stop<br>I contact closed<br>II contact open | B,C | | II |
| 668 | (BLA/WI) Thread wiper/thread clearer<br>I yes<br>II no<br>(10101000) | B,C | | I |
| 675 | (NAPO) Automatic needle change-over into position 2 (up) after enabling<br>I yes<br>II no | B,C | | II |
| 676 | (DRZ) Speed adjustment via potentiometer possible<br>I yes<br>II no | B,C | | I |
| 700 | (NAPO) Needle position 0<br>(reference position of the needle)<br>(01101000) | B,C | 0-239 | 0 * |
| 701 | (NAPO) Angular adjustment<br>I with handwheel (teach-in)<br>II by keys (+/-) | B,C | | I |
| 702 | (NAPO) Needle position 1 (needle down)<br>(11101000) | B,C | 0-239 | 75 |
| 703 | (NAPO) Needle position 2 (thread take-up lever up)<br>(00011000) | B,C | 0-239 | 203 |
| 714 | (EINZ/SN/RDR) Duration (ms) for chainstitch trimming or inverse rotation | B,C | 0-2550 | 100 |

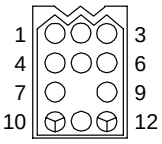
| | | | | | |
|---|---|---|---|---|---|
| 715 | (EINZ/WI) Duration (ms) of thread wiper | B,C | 0-2550 | 60 | Kl. 1 |
| | | | | 50 | Kl. 2, 3 |
| 716 | (VERZ/WI) Delay in start-up time (ms) for thread wiper | B,C | 0-2550 | 30 | |
| 717 | (SN/VERZ) Delay in start-up time (ms) for trimming method when the machine is not activated by the treadle | B,C | 0-2550 | 100 | |
| 718 | (STBR) Timing of residual brake<br>(0 = brake off)<br>(00111000) | B,C | 0-100 | 0 | |
| 719 | (PF/TA) Timing output A4<br>(0 = 100% switching on) | B,C | 0-100 | 40 | |
| 721 | (TUM/TA) Timing output A5<br>(0 = 100% switching on) | B,C | 0-100 | 40 | |
| 722 | (DRZAN) Acceleration ramp<br>1 gradual<br>50 steep | B,C | 1-50 | 40 | |
| 723 | (DRZAB) Brake ramp<br>1 gradual<br>50 steep | B,C | 1-50 | 31 | |
| 729 | (STVERZ/PF) Start delay after lowering presser foot | B,C | 0-2550 | 120 | |
| 730 | (PF/VERZ) Lift delay for presser foot after seam end | B,C | 0-2550 | 50 | |
| 749 | (EINZ/FSL) Duration (ms) of thread tension release | B,C | 0-2550 | 70 | Kl. 1, 2 |
| | | | | - | Kl. 3 |
| 758 | (REG/DRZAB) Deceleration ramp<br>I braking as per <723><br>II braking with maximal moment | B,C | | II | |
| 765 | (SN/KES/VERZ) Delay in start-up time (ms) for chainstitch trimming | B,C | 0-2550 | 30 | Kl. 1, 2 |
| | | | | - | Kl. 3 |
| 779 | (FSL/VERZ) Delay (ms) until thread tension release on | B,C<br>- | 0-2550<br>Kl. 3 | 200 | Kl. 1, 2 |
| 797 | (HWT) Hardware test | B,C | | II | |
| 798 | (EBC) Programming level C<br>I yes<br>II no | B,C | | II | |
| 799 | (MAKL) Machine class which has been selected<br>(10111000) | C | 1-3 | 1 | Kl. 1 |
| | | | | 2 | Kl. 2 |
| | | | | 3 | Kl. 3 |
| 800 | (DRR) Direction of motor rotation viewed from belt pulley<br>I left-hand rotation<br>II right-hand rotation<br>(01111000) | B,C | | II * | |
| 801 | (RDR) Reverse rotation angle after seam end | B | 5-200 | 30 | |
| 850 | (DRZ) Maximum motor speed | C | 2000-6000 | 4500 | |
| 851 | (PR/DRZAB) Brake ramp for stitch-count seams<br>I steep<br>II gradual | C | | I | |
| 884 | (REG) Proportional amplification of the speed control (in general) | B,C | 4-255 | 12 | |
| 885 | (REG) Integral amplification of the speed control | C | 0-255 | 30 | |

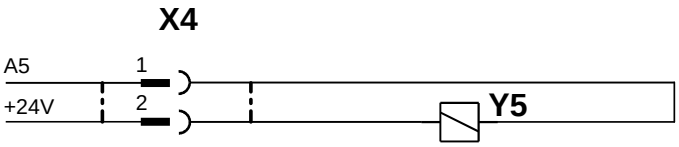
| | | | | |
|---|---|---|---|---|
| 886 | (REG) Proportional amplification of the order controllers | C | 1-255 | 20 |
| 887 | (REG) Differential amplification of the order controllers | C | 1-255 | 30 |
| 889 | (EINZ/REG) Time required for order controlling (0 = always) | C | 0-2550 | 400 |
| 890 | (REG) Proportional amplification of the superior order controllers for the residual brake | C | 1-255 | 25 |
| 891 | (REG) Proportional amplification of the lower speed controllers for the residual brake | C | 1-255 | 20 |
| 894 | (REG) Rotational direction of motor and synchronizer<br>I different<br>II same | C | | I |
| 897 | (SONST) Commutation transmitter<br>I ABB<br>II QR | C | | II |
| 898 | (SONST) Number of motor poles<br>I 4 poles<br>II 6 poles | C | | II |

# 12. Electrical Connections Diagram PE31SE

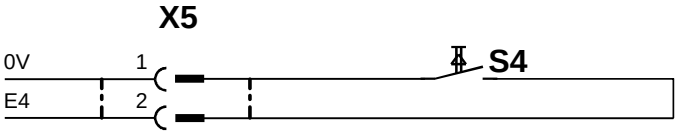


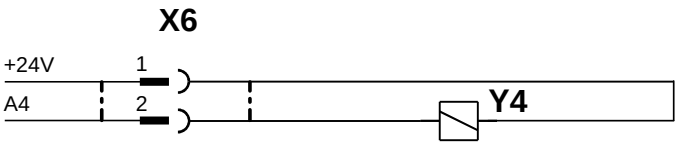



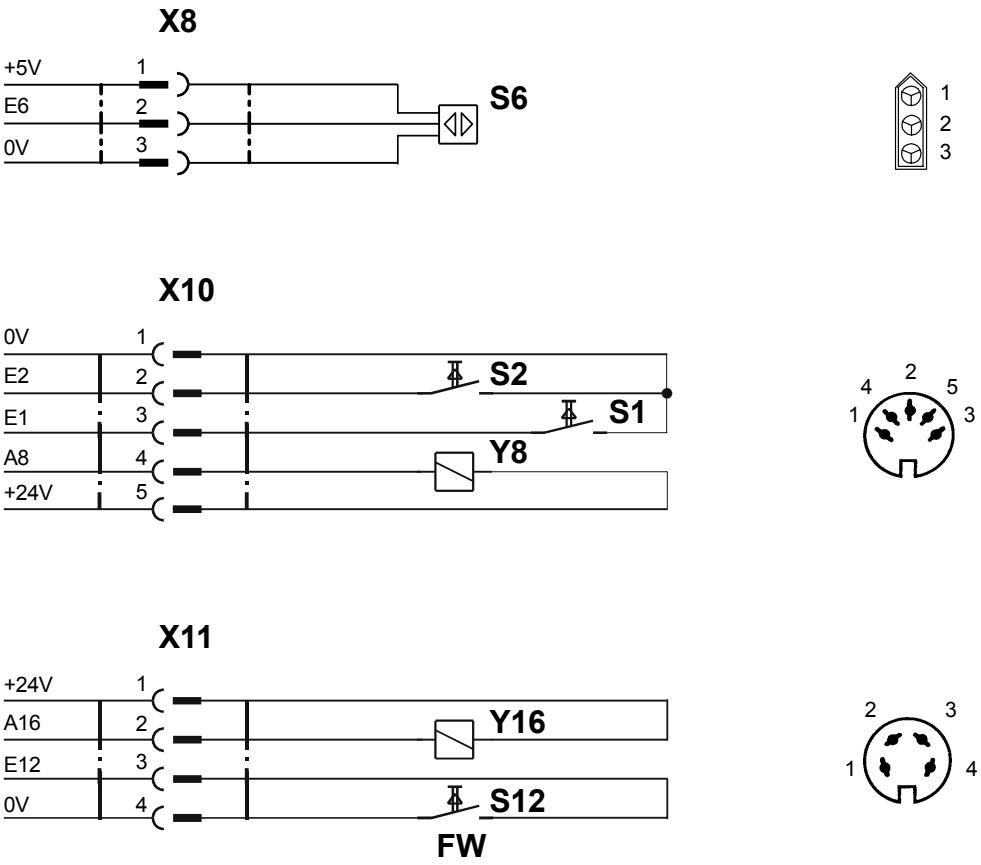





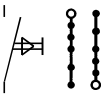
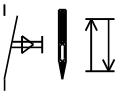
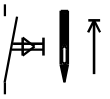
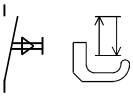




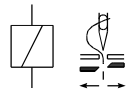
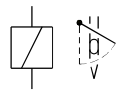
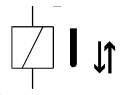
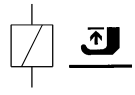
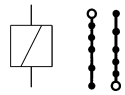
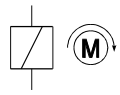
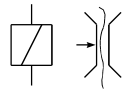
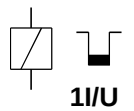



Bedeutung der Magnete bzw. Magnetventile, Taster / Meaning of magnets and/or solenoids and keys
Signification des aimants resp. solenoides et touches / Significação dos imaõs e/ou as solenoidas e teclas
Significato dei magneti, delle valvole magnetiche e dei tasti / Significación de los imanes y/o los solenoides y pulsadores / Betekenis van de magneten resp. magneetkleppen, toetsen

| | |
|---|---|
| **S1**  | Stichverdichtung / stitch condensation / rétrécissement des points / condensação dos pontos / addensamento punti / condensación de puntadas / steekverdichting |
| **S2**  <616> = I | Nadelpositionswechsel / needle position change-over / changement de position d´aiguille / troça de posição da agulha / cambio di posizione dell´ago / cambio de posición de aguja / naaldpositie-verwisseling |
| **S2**  <616> = II | Nadel hoch ohne Schneiden / needle up without thread trimming / aiguille en haut sans coupe / agulha para cima sem corte de linhas / ago su senza taglio / aguja arriba sin corte / naald omhoog zonder snijden |
| **S4**  | Presserfußlüftung / lifting presser foot / relevage du pied presseur / levantar do calcador / sollevamento del alzapiedino / elevación de prensatelas / drukvoet optillen |
| **S6**  | STOP |
| **S12**  **FW** | Fadenwächter / thread monitor / garde-fil / guarda da linha / controllafilo / guardahilos / draadcontrole |

Bedeutung der Magnete bzw. Magnetventile, Taster / Meaning of magnets and/or solenoids and keys
Signification des aimants resp. solenoides et touches / Significação dos imaõs e/ou as solenoidas e teclas
Significato dei magneti, delle valvole magnetiche e dei tasti / Significación de los imanes y/o los solenoides y pulsadores / Betekenis van de magneten resp. magneetkleppen, toetsen

| | |
|---|---|
| **Y2**<br>I max<br>8 A ✱  | Fadenschneiden / thread trimmer /<br>coupe-fil / corte de linhas /<br>rasafilo / cortahilos / draadsnijder |
| **Y3**<br>I max<br>8 A ✱<br><799> = 1  | Fadenwischer / thread wiper / écarteur de fil /<br>retira-linhas / scartafilo / retirahilos /<br>draadwisser |
| **Y3**<br>I max<br>8 A ✱<br><799> = 2  | Kettelfinger / chaining-off finger / crochet de remmaillage /<br>dedo remalhador / levetta di rimettaggio / dedo de remaller /<br>klemvinger |
| **Y3**<br>I max<br>8 A ✱<br><799> = 3 | Fadenzieher / thread puller / tire-fil /<br>tirar de linhas / tira filo / tirahilos /<br>trekkvinger |
| **Y4**<br>I max<br>8 A ✱  | Presserfuß heben / lifting presser foot /<br>relevage du pied presseur / levantar do calcador /<br>sollevamento del alzapiedino / elevación de prensatelas /<br>drukvoet optillen |
| **Y5**<br>I max<br>8 A ✱  | Stichverdichtung / stitch condensation / rétrécissement des points /<br>condensação dos pontos / addensamento punti / condensación de puntadas /<br>steekverdichting |
| **Y8**<br>I max<br>8 A ✱  | Motor läuft / motor runs / moteur en marche /<br>motor em movimento / motore in moto / motor en marcha /<br>loop van de machine |
| **Y9**<br>I max<br>8 A ✱  | Fadenspannunglösen / thread tension release / détendeur de fil /<br>soltar tensão da linha / sbloccaggio tendifilo / detensión del hilo /<br>verbreken van de draadspanning |
| **Y16**<br>I max<br>100 mA **1I/U**  | Zählsignal / count signal / signal de comptage /<br>sinal de contagem / segnale conteggio / señal del contador /<br>telsignaal |

* Die Summe der Lastströme aller gleichzeitig eingeschalteten Stellglieder (Magnete, Magnetventile) darf den Wert von 4A nicht überschreiten (siehe hierzu Kapitel 2. Technische Daten).

* The total of load currents of all servos activated simultaneously (solenoids, solenoid valves) is not allowed to exceed 4 amps (see also section 2. Technical Specifications)

* Le total des courants de charge de tous les vérins (aimants,électro-vannes) activés simultanément ne doit pas dépasser 4 A (voir aussi le chapitre 2, „caractéristiques techniques“)

* A soma das correntes sob carga de todos os actuadores ligados ao mesmo tempo (imans, solenóides) não pode ultrapassar o valor de 4A (ver também capítulo 2, Dados Técnicos).

* La somma delle correnti di carico di tutti gli attuatori inseriti contemporaneamente (magneti, elettrovalvole) non deve essere superiore a 4 A (vedere il capitolo 2 dati tecnici).

* La suma de las corrientes bajo carga de todos los elementos de todos los componentes de regulación conectados simultáneamente (imanes, válvula magnética) no podrá sobrepasar el valor de 4A (véase también el capítulo 2. de datos técnicos).

* De belastingsstroom van alle tegelijkertijd ingeschakelde bedieningsschakels (magneten, magneetventielen) mag in totaal niet meer dan 4 A bedragen (zie hiervoor hoofdstuk 2. Technische gegevens)

# 13. Maintenance and Repair

!! Before starting maintenance or repair work, switch off the SERVO-TOP,
separate the drive system from mains power (for instance by pulling out the mains plug)
and wait for the motor to come to a complete stop.

General maintenance work must only be done by specially trained personnel paying close attention to the operating instructions.

The SERVO-TOP ist largely maintenance-free.
However, make sure to perform the following maintenance work:

Depending on the operating conditions, clean the drive system regularly, at least once a week, from any dust or lint. Make sure in particular that the ventilation louvres and cooling fins of the motor, especially the cooling fins between the motor and the control box, are perfectly clean (Fig. 13).

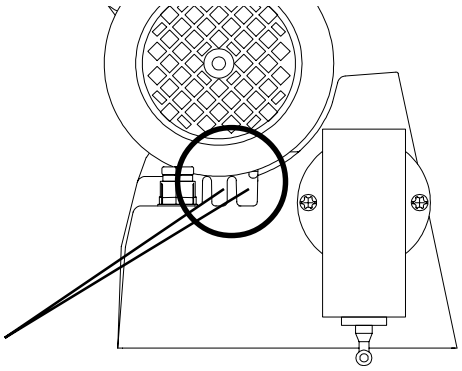



**Fig. 13**

Remove any threads caught on the synchronizer shaft or on the belt pulley and/or motor shaft.

Check if the drive system is perfectly secured to the stand and that the accessories (synchronizer on machine shaft, speed control unit on control box) are safely mounted in their respective positions.

Check the drive belt for any wear and for correct tension.
Incorrect belt tension can increase noise and vibrations.

When opening covers or removing parts, apart from those removable by hand,
live elements can be exposed.
Connections can also be electrically live.

If you require to open the drive system before starting maintenance or repair work or before replacing any parts, disconnect the drive system from any and all power sources.

If maintenance or repair work on the open unit is unavoidable, this may only be done by qualified personnel familiar with the risks involved. Observe all regulations as per EN 50110.

There can still be capacitors carrying a charge in the power electronics system, even when the drive system has been disconnected from all power sources. To avoid injury by electrical shock, it is therefore essential to wait at least 10 minutes between mains power shutoff and opening the control box.

In order to protect semi-conductor components from overvoltage, use only high-resistivity measuring equipment when making checks on the control system.

Any repair or servicing work requiring skilled knowhow may only be done by qualified personnel authorized by Quick-Rotan.

We emphasize that in accordance with the product liability law we are under no responsibility for damages caused by our products if these are due to

- unqualified repair
- the use of components not authorized by us
- actions made by any persons not authorized by us.