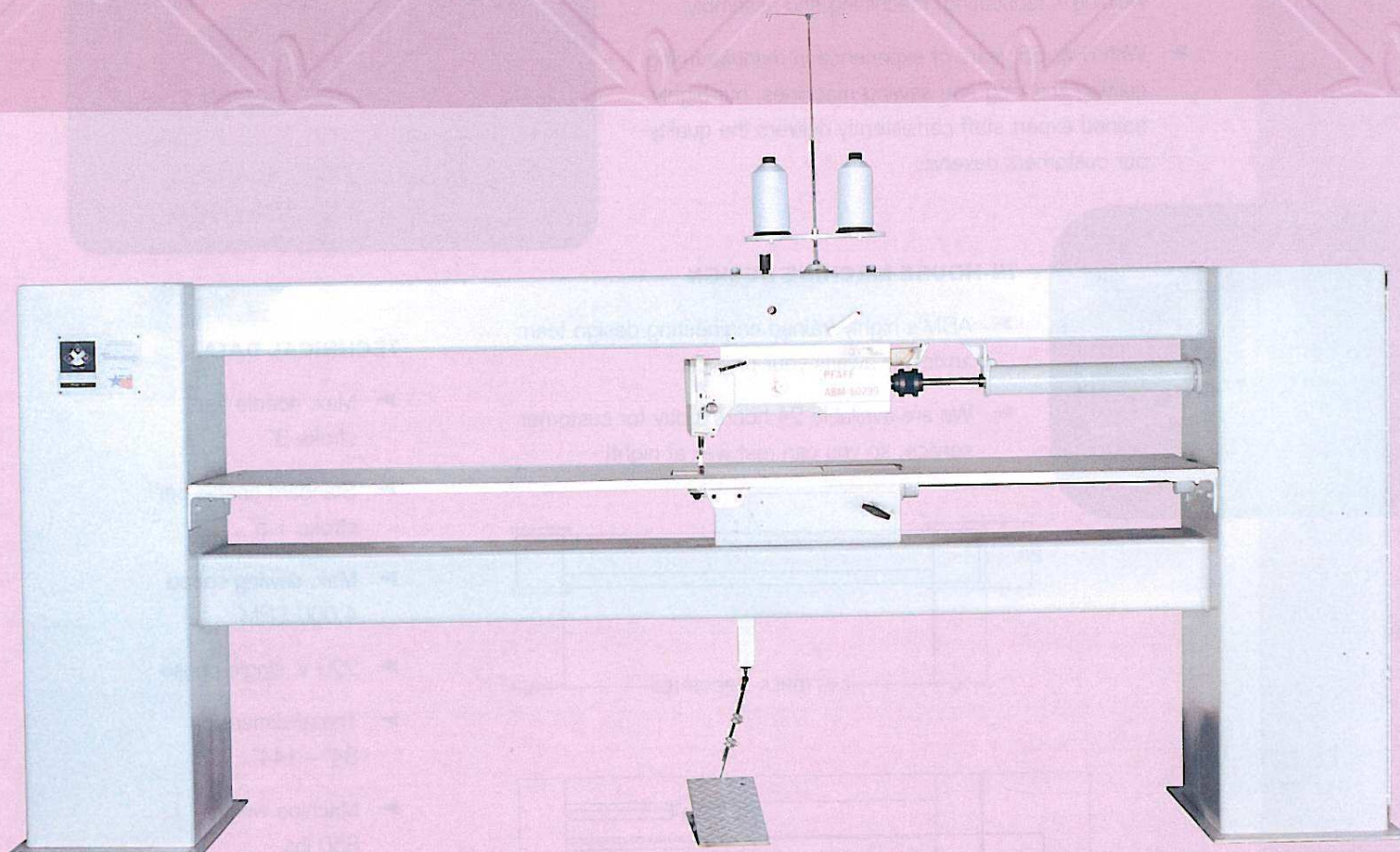


LA-763

LONG ARM SEWING MACHINE



SINCE 1947



OVERVIEW

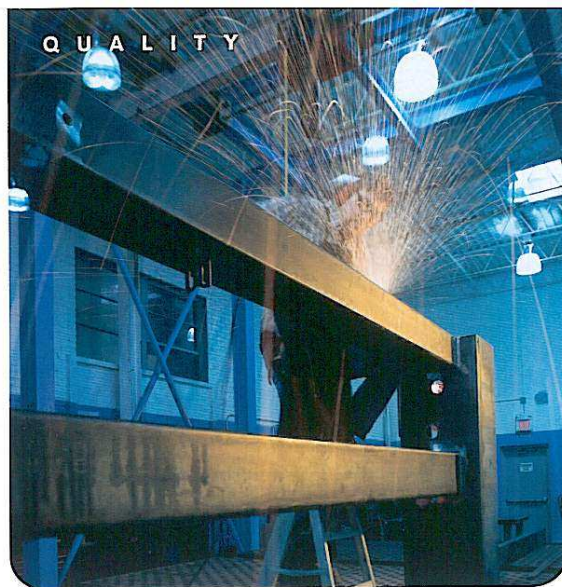
ABM International, Inc. has spent many years perfecting the world's largest, most versatile Long Arm Sewing Machine. The LA-763 Long Arm Sewing Machine can be manufactured to specified lengths as desired by the end user. This extremely rigid bridge type design eliminates the problem of sagging and vibration harmonics allowing for much greater lengths than conventional cantilever C-throat machines. The LA-763 allows the sewing operator to easily handle larger products by eliminating the bunching of fabric under the throat of standard long arms available on the market today. Examples of these products are tents, awnings, fabric structures, parachutes, comforters, bedspreads, mattresses and much more.

FEATURES & BENEFITS

- ▶ Any desired width available, from 48" – 144".
- ▶ Many different models of sewheads available, such as Singer, Pfaff, Juki, etc.
- ▶ Ultrasonic welding, cutting and heat sealing.
- ▶ Backtacking, threadcutting.
- ▶ Adjustable product guides.

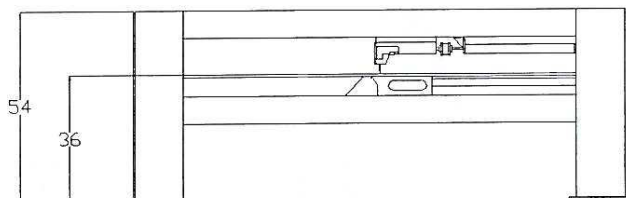
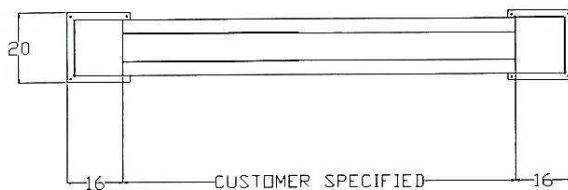
QUALITY

- ▶ ABM International, Inc. is a vertically integrated manufacturer with in-house design, programming, welding / fabricating, machining and assembly.
- ▶ With over 55 years of experience in manufacturing quilting and long arm sewing machines, our highly trained expert staff consistently delivers the quality our customers deserve.



IN-HOUSE MACHINE DESIGN

- ▶ ABM's highly trained engineering design team anxiously awaits your projects.
- ▶ We are available 24 hours a day for customer service, so you can rest well at night!



TECHNICAL DATA

- ▶ Max. needle bar stroke 3"
- ▶ Standard needle bar stroke 1.5"
- ▶ Max. sewing speed 4,000 SPM
- ▶ 220 V. single phase
- ▶ Throat dimension 84" – 144"
- ▶ Machine weight 850 lbs.
- ▶ Compound feed available



ABM INTERNATIONAL, INC.

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Houston, Texas 77060

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www.abminternational.com



ABM International, Inc., headquartered in Texas, has been serving the home furnishing market of the textile industry for over 60 years.

At ABM International, Inc. we are committed to manufacturing excellence and superior customer service. Let us provide you with the highest quality state-of-the-art machinery that will enhance your operations, improve your production, reduce your costs—and ensure your success!

TABLE OF CONTENTS:

Introduction

Section 1.0 – Safety

Section 2.0 - Machine Setup

Section 3.0 – Machine Operation

Section 4.0 – Troubleshooting guide and notebook

Section 5.0 – Parts List

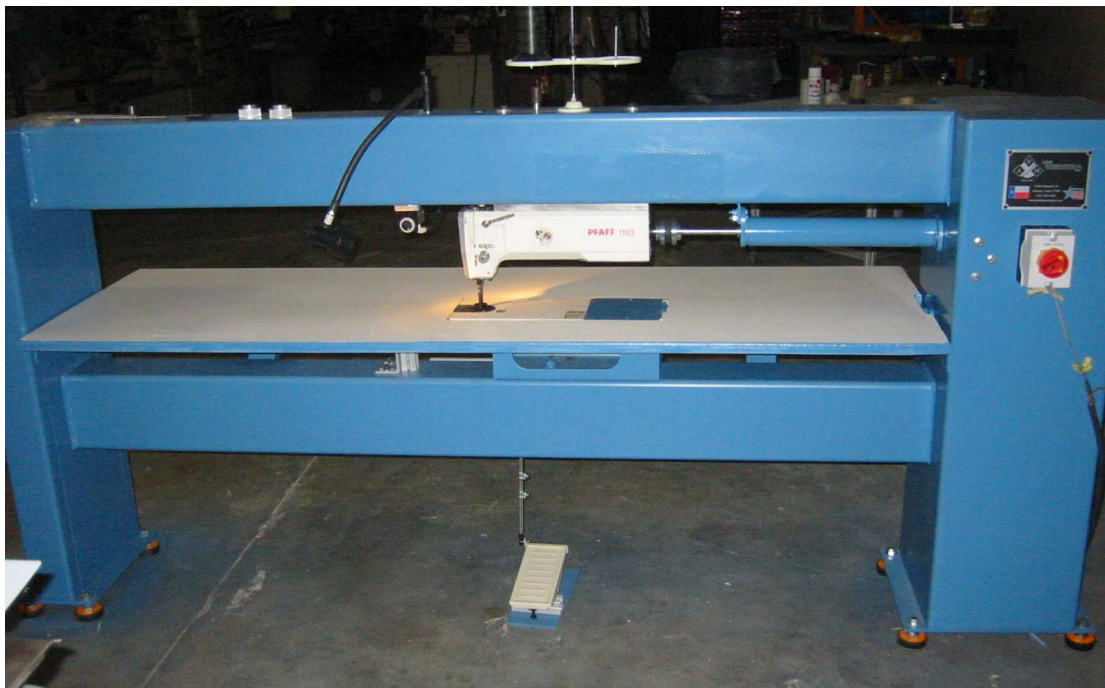


Figure 0.1 – LA-763

Introduction

ABM International would like to thank you for the purchase of an LA-763 Long Arm Sewing Machine. ABM is confident that this machine will meet or exceed your expectations for cost, speed and durability.

If at anytime you experience problems with any of your ABM machines we ask that you contact us - 24 hours a day by calling our service department at (281) 443-4440. We can help you solve the problem quickly, and correctly. Your calls, questions, and comments will in turn help us to perfect the quality of our products and services in the future.

Once again, we thank you for your purchase.

ABM International, Inc.

Joe Podolski
Vice President
Engineering Department

Section 1: Safety

1.0 Safety Introduction

As with the operation of all machinery, safe operation of the LA-763 is a major concern of ABM International, Inc. The purpose of this section is to inform personnel of the safe and prudent operation of an LA-763.

We have attempted to recommend the most effective methods and calculations to warn against actions that could result in personal injury, or make equipment unsafe. It is important to understand that ABM cannot anticipate, or list all conceivable safety methods and warn of all the possible hazards. In the interest of promoting safety, ABM advises that the operating personnel should always make sure that personal safety and the safe operation of the machine will not be adversely affected by their actions.

It is imperative that the operating personnel of the LA-763 read and understand the information in this manual before operating the machine.

1.1 Safety Policy Statement

The conservation of the assets of any company, which include the buildings, equipment, supplies and inventories as well as personnel, must be and is the responsibility of all levels of management. The purpose of a personnel and property conservation program is to insure that all phases of management recognize that personnel and property conservation are both inseparable parts of a company's objective...to produce quality products at the lowest possible cost.

Safety of personnel in every aspect must be of first consideration. The implementation of a conservation program will eliminate human suffering and effectively lower the direct and indirect costs resulting from employee injury. It will substantially reduce the exposure and probability of damage and / or loss of company's physical assets.

1.2 Safety Practices

The safety factors must be observed to ensure safe operation of the LA-763 .

1. Read and understand the operating instructions of the LA-763 before operating.
2. Use extreme caution when working around the LA-763 electrical controls.
3. Keep hands or other body parts away from the moving parts of the LA-763 .
4. Wear appropriate personal safety protection.
5. Stop the LA-763 immediately at any sign of malfunction or danger.
6. Do not crawl under or into the LA-763 for any reason during the operation of the machine.
7. Do not reach into the LA-763 at any time during the operation of the machine.
8. Do not climb, walk, or stand on the LA-763 at any time.
9. Do not tamper with factory installed guards and or safety devices.
10. Never operate machinery without all ABM installed guards and safety devices intact, and in working order.

11. Before starting the LA-763, ensure that no loose tools, bars or parts are lying in or on any part of the machine.
12. Proper fire fighting equipment should be kept in good operating condition and kept near in the event of fire.
13. Never attempt to service any of the pneumatic components until the unit is relieved of all air pressure.
14. Do not wear loose clothing or jewelry when operating the LA-763.
15. Always keep hair from coming in contact with moving parts.

SECTION 2.0 – Machine Setup

The LA-763 ships fully tested ready to operate. As a result, this manual provides a section on machine setup so that you can install the machine. Please read this manual in its' entirety and follow all ABM instructions, especially the inspections. Total setup time, less power and air hook-up, should take approximately 1 hour.

SETUP INSTRUCTIONS:

INSPECTION #1: Upon receipt of the machine, check to ensure that there is no visible damage. Figure 0.1 and the front cover of this manual are enough for this inspection.

Note: that some components may be in different locations depending on the version of the machine.

Determine the location in your facility for the sewing machine. Attach the eight (8) machine legs supplied with the machine to the plates that were used to bolt the machine to its skid. Level and position the machine in the desired location. Though not required, ABM recommends that the machine be bolted to the floor. Place the foot pedal in front of the machine on the floor and connect it.

Run a 220VAC line (15AMP) to the machine location. Though the machine does not come equipped with a 220V plug, "ABM" does not recommend the use of any type of extension cord to power the machine. As with any machine, power should be run through approved conduit and ducting with proper termination. ABM does not supply a main power disconnect with the machine and recommends that the customer install one. You may connect the power to the machine at this time.

INSPECTION #2: Will confirm that the electronics of the LA-763 long arm sewing machine are functioning properly.

WARNING: ELECTRICAL SHOCK HAZARD. THIS INSPECTION WILL REQUIRE POWER TO BE ON WHILE THE ELECTRONICS CABINET IS OPEN. IF A PROBLEM IS FOUND, YOU SHOULD NOT ATTEMPT TO REPAIR IT WITH THE POWER ON. DISCONNECT THE MACHINE PRIOR TO ADJUSTING ANY COMPONENTS WITHIN THE ELECTRICAL CABINET.

Step one; open the electronics cabinet located on the right vertical end-stand of the steel bridge of the machine. The internals of the cabinet will look like Figure 1.0. From top to bottom the components are as follows: Lamp power supply, servo motor, servo motion controller .

Upon power up, the sewhead needles up.



Figure 2.0 – Electrical Panel.

FINAL TEST:

WARNING – WHEN OPERATING THE MACHINE, YOU MUST ENSURE THAT THERE ARE NO LOOSE ITEMS SUCH AS TOOLS FOOD DRINKS ETC. ON THE MACHINE AND THAT ALL PESONNEL ARE CLEAR OF THE MACHINE.



Figure 2.1 – LA-763 sewing head.

Inspect the front of the machine and ensure that the sewhead is free of obstructions.

Step 1: Depress the treddle forward and the sewhead will begin to run.

Step 2: Release the treddle and the needle will stay down to pivot your fabric.

Step 3: Depress the treddle backwards and the needle will raise to the upper position.

Setup and inspection is now complete.

SECTION 3.0 – Machine Operation

This section will discuss how to properly use the LA763 to fulfill all of your sewing needs.

The LA-763 is equipped with either a mechanical or pneumatic foot lifter to create clearance under the foot when inserting and removing your product to be sewn.

For the mechanical lifter:



Figure 3.0 – Foot Lifter Operation.

To raise the presser foot, pull down on the white presser foot lift lever at located at the back of the sewhead. To release the presser foot, pull the silver release bar located at the top of the back of the sewhead.

For the pneumatic lifter:



Figure 3.1 – Pneumatic foot lift Operation

Toggle switch mounted to the left of the sewing head will raise and lower the foot.

Operating the LA-763 is a simple task. Turn the main power on and allow the machine to energize (this may take 5 seconds). While the machine is powered on please make sure that the foot pedal is not being pressed or the machine will activate an electrical safety measure that will not allow the sewhead to work. To reset the safety, turn off the machine remove anything that may be activating the pedal and turn the machine on.



Figure 3.2 – Power Disconnect

The speed of sewing can be adjusted two ways. The first is via the foot pedal. Pressing the pedal further will cause the machine to speed up and releasing pressure will make the machine slow down.



Figure 3.3 – Foot pedal control

Speed can also be limited on the servo controller interface. Press the TE SPEED button until the menu with speed is shown. Press the four lower arrow keys to increase or decrease the desired maximum speed. When modification is complete, press TE SPEED to store the number in memory.



Figure 3.5 – Servo motor controller interface

SECTION 4.0 – Troubleshooting guide

ABM has done its best to include as much information as possible. However, not all problems are listed, therefore ABM asks that whenever a problem occurs you contact a service technician at our home office. To reach service dial 281-443-4440 and ask for a service technician, they are on call 24 hours a day, seven days a week.

Troubleshooting notes:

A few blank pages are provided so that you and your personnel can keep records and notes of machine problems. By using this section and keeping it attached to the manual, you will always have your own personalized quick reference repair section.

TROUBLESHOOTING NOTES:

Date	Problem	Solution

TROUBLESHOOTING NOTES:

Date	Problem	Solution

LA-763M

Long Arm machine manual: Electric versions
www.abminternational.com

- ◆ Installation instructions
- ◆ Operational guide
- ◆ Troubleshooting guide
- ◆ Parts list





Table of Contents



- ◆ Section 1.0 - Machine Operation Guide
- ◆ Section 2.0 - Troubleshooting guide
- ◆ Section 3.0 - Parts List

EcoDrive

QE3760/QE5540

Instruction Manual

Part 1



QUICK-ROTAN Elektromotoren GmbH
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67655 Kaiserslautern
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E-Mail: tech.suppl@quick-rotan.com
www.quick-rotan.com

English 2004-03-10

The  symbol confirms that the respective drive system meets the applicable safety requirements of the following EU directives:

- EC Maschine Directive 89/392/EWG
- EMV Directive 89/336/EWG
- Low Voltage Directive 73/23/EWG

Contents

Page

Part 1

1.	General Safety Information	1.1 - 1.2
2.	Technical Specifications	2.1 - 2.3
3.	Range of Application	3.1
4.	Scope of Supply	3.1
5.	Transport and Storage	3.1
6.	Mounting Instructions	6.1 - 6.7
6.1	Mounting of the Motor	
6.2	Adjustment of the motor and machine	
6.3	Electrical connection	
6.4	Preventive Action Against Electrostatic Charges	
6.5	Mounting of Speed Control Unit (SWG)	

Part 2

7.	Construction and Description of the EcoDrive Drive System
8.	Application
9.	Programming by the User
10.	Start of Operation

Part 3

11.	Survey and List of Parameters
12.	Electrical Connections Diagram

Technical updatings reserved !

1. General Safety Information

This EcoDrive Sewing Drive System has been constructed and tested in compliance with the relevant regulations and safety standards and has left our factory in proper safety condition.

In order to maintain this condition and to ensure non-hazardous operation, the user is obliged to observe the information and warning notes contained in this Operating Instructions Manual.

The EcoDrive is not a ready-to-use machine, but is designed for installation into machines of the sewing-thread processing industry operating in clean and dry localities. It is not allowed to operate the EcoDrive in any machine unless the machine destined for receiving installation of this motor is specifically identified as being in compliance with the regulations of the EC Rule on machines.

Any application or use beyond the conditions stipulated above, such as outdoors, in moist or explosion hazardous environment, is not considered to be in compliance with specifications. Application in compliance with regulations and standards also includes close observation of the operating, maintenance and repair conditions stipulated by the manufacturer.

The EcoDrive can function safely and reliably only when used in compliance with this Operating Instructions Manual and in compliance with the use it is intended for.

Read this Operating Instructions Manual thoroughly before unpacking and commissioning the ECO-DRIVE. Please make yourself acquainted with all safety, installation, operating and maintenance instructions before starting operation of the EcoDrive, its accessories and attachments.

Any and all activities on and by means of the EcoDrive must be carried out exclusively under close observation of the general and specific safety instructions given in the ensuing sections of this Operating Instructions Manual!

All persons involved must be made thoroughly familiar with these safety instructions, requiring them to observe these closely. Non-observation of these safety instructions can cause injury to persons, damage to objects or malfunction of or damage to the drive system itself.

Any and all accident prevention regulations as well as the rules on work in compliance with proper practices and safety standards valid in the user country involved must be fully observed. This drive system is subject to installation and commissioning by properly trained personnel!

Installation and commissioning of the EcoDrive must be made with due care by qualified technicians so as to minimize the effects of any disturbing influences which are likely to constitute health hazards to personnel or any other perilous condition.

Doing any work on any parts or elements of the equipment being under live voltage is not permitted! Exceptions are subject to EN 50110.

Before removing any cover parts or installing any attachments or accessories - such as speed control unit, light barrier control etc. - switch the machine off, shut off physical connection with mains voltage, and wait for the machine to come to complete stop. Do not open the control box before ten minutes have elapsed!

In order to reduce any hazard of burns, fire, electrical shock, or injury, it is basically not permitted to make any structural modifications or other changes on the EcoDrive.

It is not allowed to operate the equipment with any cover or protection elements removed!

Before leaving the workplace, turn the ON/OFF switch into its OFF position. In case of prolonged pauses of operation, remove the mains plug from the wall outlet so as to safeguard the drive system against being inadvertently switched on again.

Any equipment or auxiliary facilities additionally connected to the control system of the EcoDrive are only allowed to be operated on low voltage generated by a safety transformer!

Never use the drive system with its ventilation louvers clogged. Make sure that ventilation louvers are unobstructed by fibres, lint, dust etc.

Do not introduce or drop any objects, such as needles, into the ventilation louvers.

Keep your hands out of the area of moving parts!

Do not operate the EcoDrive when using aerosols (sprays) or oxygen!

This Operating Instructions Manual is an integral part of the EcoDrive and must be passed on with it in case of change of ownership.

The instructions given in the sections below are destined for your own safety as well as for that of other persons.



Warnings given in various section of this Operating Instructions Manual for the purpose of preventing specific hazards of injury to persons or damage to the equipment are identified by the symbol shown at left.



This symbol is a warning given on the EcoDrive, indicating dangerous voltage.



The EcoDrive is permitted to operate only in a properly functional protection earth system in compliance with all local rules and regulations.

2. Technical Specifications

Rated Values:

	ED QE3760	EDL QE5540
Voltage (U_N) [V]	230, single phase AC	
Frequency (f_N) [cps]	50/60	
Current (drive system) (I_N) [A]	3,5	5,0
Current (control system) [A]	0,6	
Power (output) (P_2) [W]	375	550
Speed (n_n) [1/min]	6000	4000
Torque (M_n) [Nm]	0,63	1,2
Moment of motor inertia (J_{mot}) [kgcm ²] (without belt pulley)	0,5	1,0
Operating mode	S5 (40 % duty cycle at $t_s = 2.5$ s) Intermittent operation with electrical brake action, relative duty cycle 40 %, operating cycle time 2.5 s	
Protection type	IP40	
Insulation class	E	

Limit Values

Range of voltage [V]	190 - 240 +/- 10% single phase	
Speed (n_{max}) [1/min]	9000	4500
Torque (acceleration) (M_{max} , short-time) [Nm]	3	7
Power (short-time) (P_{2max} , short-time) [W]	1000	1500
Maximum permissible (J_{masch}) [kg cm ²] sewing machine inertia, reduced to the motor shaft (J_{mach})	4,5	9,0

Conditions of Use

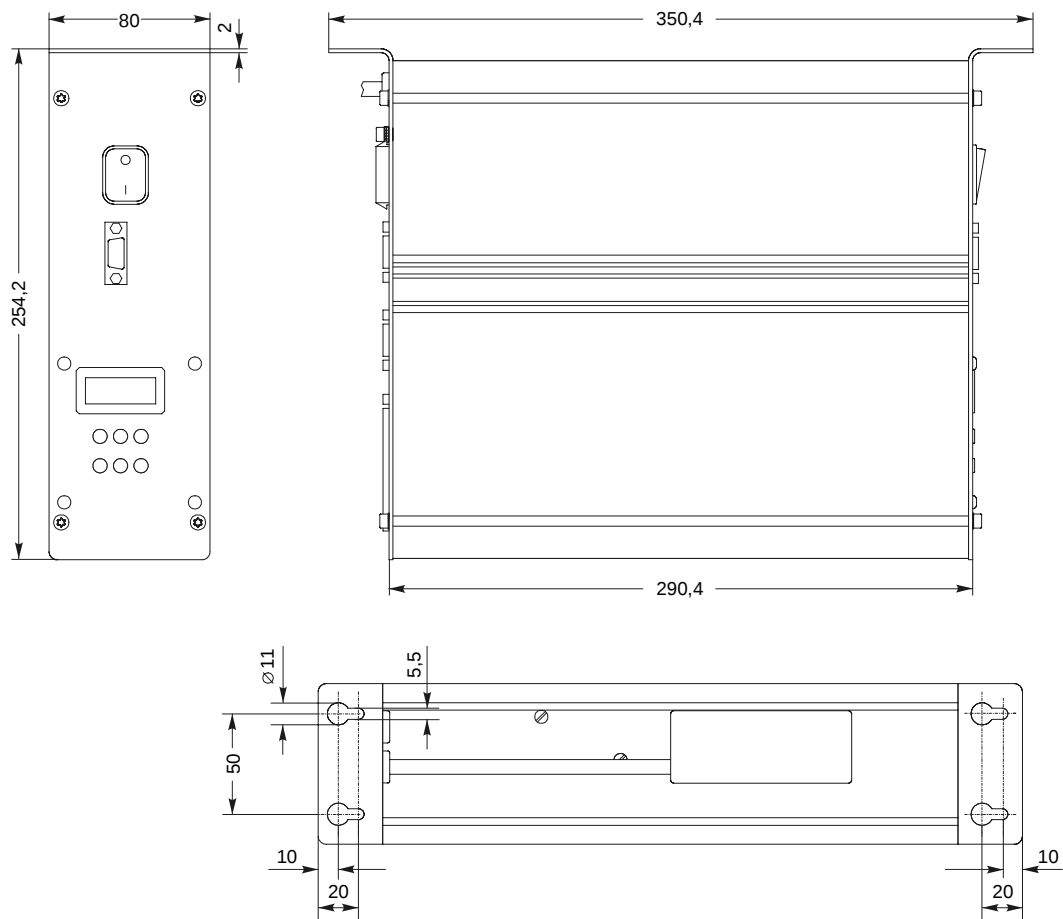
Ambient temperature [°C]	+ 5 bis 45
Ambient temperature (24 hour average) [°C]	< 35
Humidity (relative)	85% bei 30 °C

Driving voltage of the Outputs

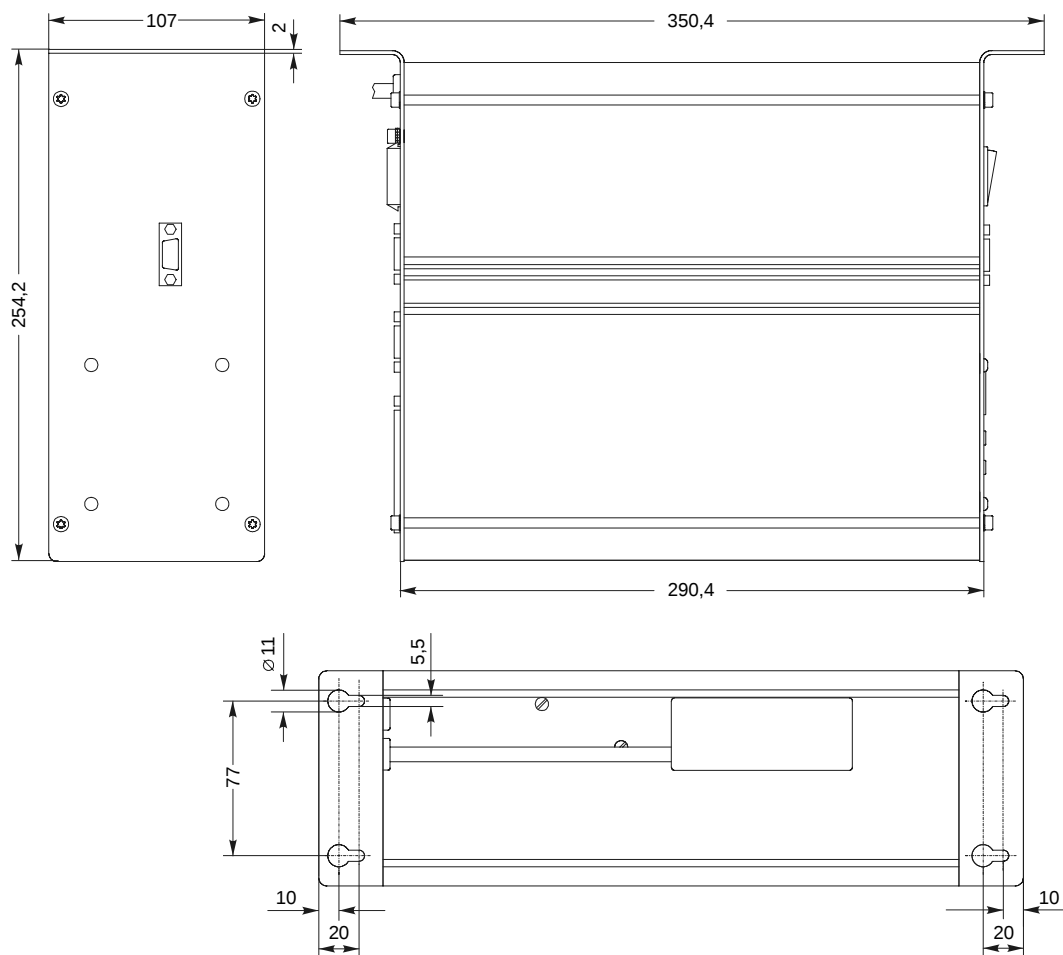
Idling voltage [V]	25 DC
Voltage under load [V]	24 DC at $I = 4$ amps (20 DC at $I = 10$ amps short-time)
Power	96 (200, short-time)
Load current	4
Maximum load current	10, (short-time)

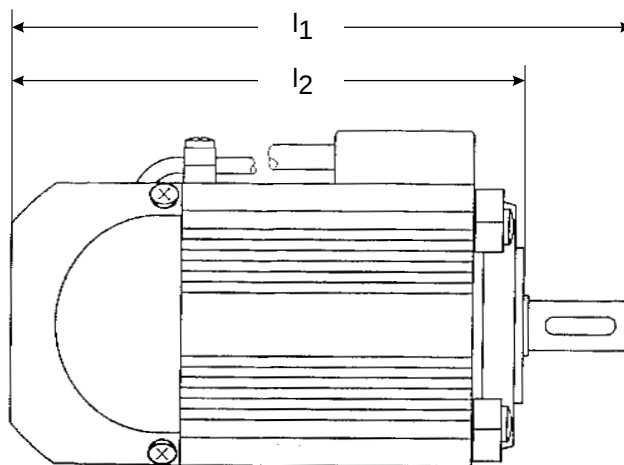
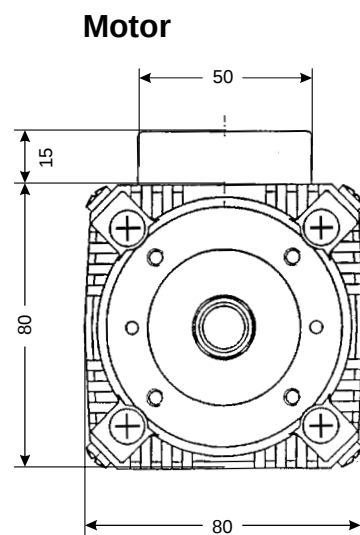
Note: The accumulated load currents of all simultaneously operated outputs (solenoids, solenoid valves) are not *allowed to exceed 4 amps!*

Dimensions of the Control System (small version) ED



Control System (broad version) EDx





	MS	MSL
$l_1 =$	179	219
$l_2 =$	147,5	187,5

3. Range of Application

The **EcoDrive** is not a ready-to use machine, but is intended for installation into other machines, such as sewing units and sewing equipment used by the sewing thread processing industry.

The **EcoDrive** is destined for use in clean and dry localities.

Any application or use beyond the conditions stipulated above, such as outdoors, in moist or explosion-hazardous environment, is not considered to be in compliance with specifications.

Application in compliance with regulations and standards also includes close observation of the operating, maintenance and repair conditions stipulated by the manufacturer.

4. Scope of Supply

1x Synchronous motor QE3760 with commutation transmitter
or Synchronous motor QE5540 with commutation transmitter

1x Control system with mains power switch

1x Speed control unit SWG2 (Art.Nr.63.012) + accessories

1x Operating Instructions Manual

Optional:

1 Synchronizer (Art.Nr. 62.055)

1 Operator panel EcoTop

5. Transport and Storage

The EcoDrive has left our factory after thorough final inspection.

Please check the drive system for any transport damages.

If necessary, file claims with the carrier.

Complaints for missing parts will be accepted within 14 days from the date of purchase.

The EcoDrive and its accessories are shipped in a carton with polyurethane insert;

outside dimensions: L = 600 mm,
 W = 405 mm
 H = 280 mm

This packing material protects the EcoDrive against outside influences during transport and storage.

The EcoDrive is designed to withstand temperatures during transport and storage of between -25°C and +55°C and briefly, but not longer than 24 hours, up to +70°C.

Storage in the packing material must be in a dry environment.

Handle the carton and its contents with care!

6. Mounting Instructions

Before starting installation, please remove all parts from the packing material.
The carton holds the **EcoDrive**, accessories and Operating Instruction manual.
Check the content if complete.

If you have any questions with the installation, not clarified through the Instruction Manual,
please contact us or one of our nearest Service Stations.

Assemble the **EcoDrive** in compliance with the instructions and illustrations.

6.1 Motor assembly

There are three different ways to assemble the motor to the machine.

1. Machine head mount (rear / external)
2. Under the table top mount
3. Machine head mount (direct drive, internal)

There are three different ways to transmit the motor drive:

- Timing belt and timing gears.
- “V” belt and pulley.
- Direct drive on main shaft.

6.1.1 Use of timing belt.

Transmitting torque through timing belt, slippage is avoided.
Transmission ratio between motor and machine is 1:1.
Being so, no reference signal from sewing machine is required.
Many transmission ratios in both directions are possible,
on the available timing belt wheels.
In this case a reference position signal is needed by the machine.

6.1.2 Use of “V” belt

Transmitting torque through “V” belt, slippage is possible. Transmission ratio between motor and machine is variable. Reference signal from sewing machine is required.

6.1.3 Assembly of the motor to the machine head.

Following, list of parts required:

- Assembly bracket (machine type related)
- Motor timing gear
- Machine timing gear
- Timing belt
- Belt cover

6.1.4 Assembly of the motor under the table

Following list of parts required:

- Assembly bracket
- Motor pulley
- Machine pulley
- “V” belt
- Belt cover
- If necessary synchronizer PD3
- Y-adapter

6.2 Motor and machine adjustment

- a) Adjust motor shaft to reference position (zero position)
 - Terminal box at top (viewpoint)
 - Motor shaft groove (-90°) quarter to twelve in relation to terminal box equals zero position, rotate motor shaft.
- b) Adjust machine reference position (zero position)
 - Rotate machine pulley (sewing rotation) until needle point starts penetrating needle hole of throat plate (zero position)
- c) Assembly of timing belt
 - Slide belt to motor and machine timing gear maintain and guarantee positions described in a) and b).

6.3 Electrical Connection (to Mains Power)

All work on the electrical equipment (connection, maintenance, repair) is permitted to be performed only by or under the supervision of a properly qualified technician.

The EcoDrive is designed for connection to an earthed AC mains power system having a rated voltage between

190 and 240 Volts, 50/60 cps.

Before connecting the power supply line, make sure that your mains power voltage is within the rated voltage range specified on the nameplate of the EcoDrive.

Connection to mains power is permitted only by means of a multi-contact plug with protection earth contact. Fixed connection is not permitted.

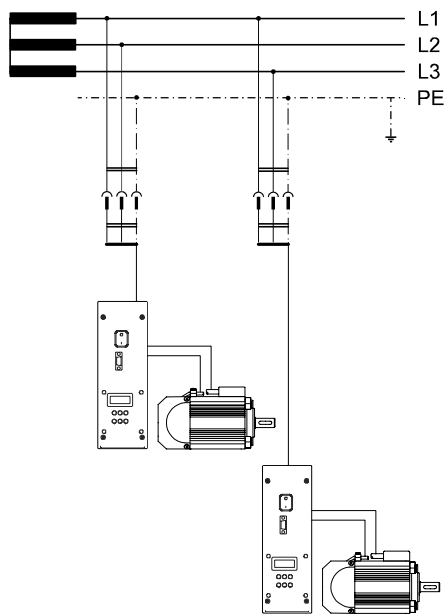
Connect the following potentials:

Phase (L1 or L2 or L3)
Neutral conductor (N)
Protection earth (PE)

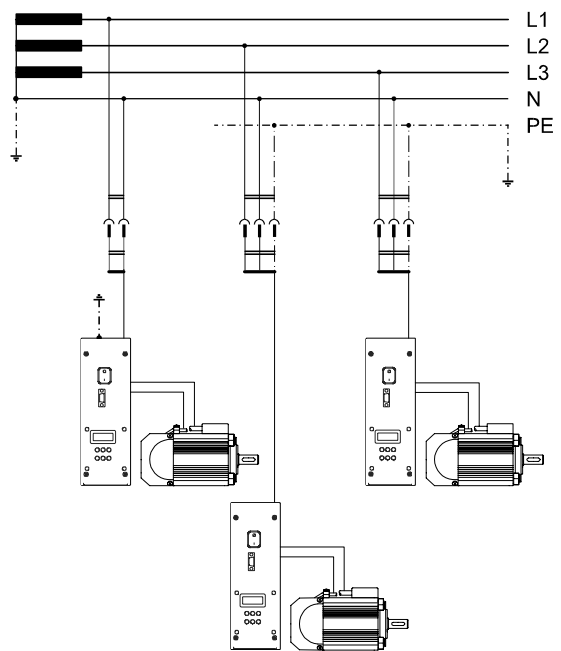
The EcoDrive is designed for connection to the following types of mains power systems:

- TN (system with a directly earthed point and with a protection earth conductor (PE) connected to this point)
- TT (system with a directly earthed point, the protection earth conductor (PE) not being connected to this point)
- IT (system not directly earthed)

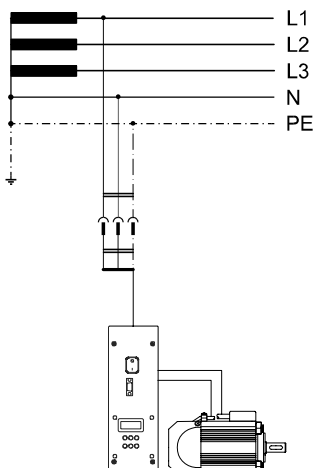
IT-System



TT-System



TN-System



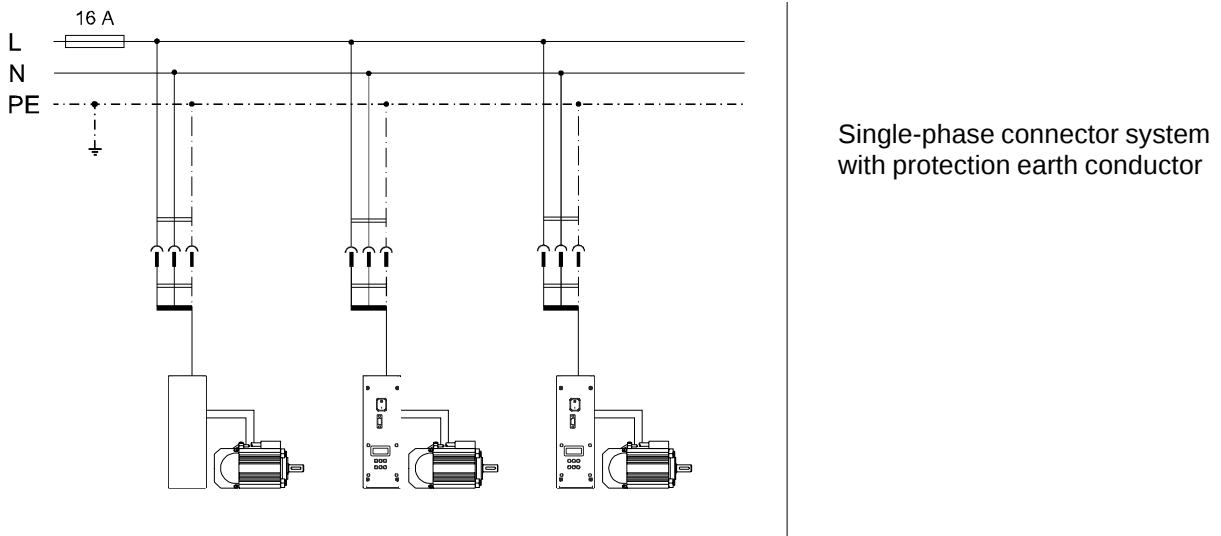
The following applies to TT and IT systems:

All elements protected by a common protective device must be connected to the same earthing via protection earth conductors.

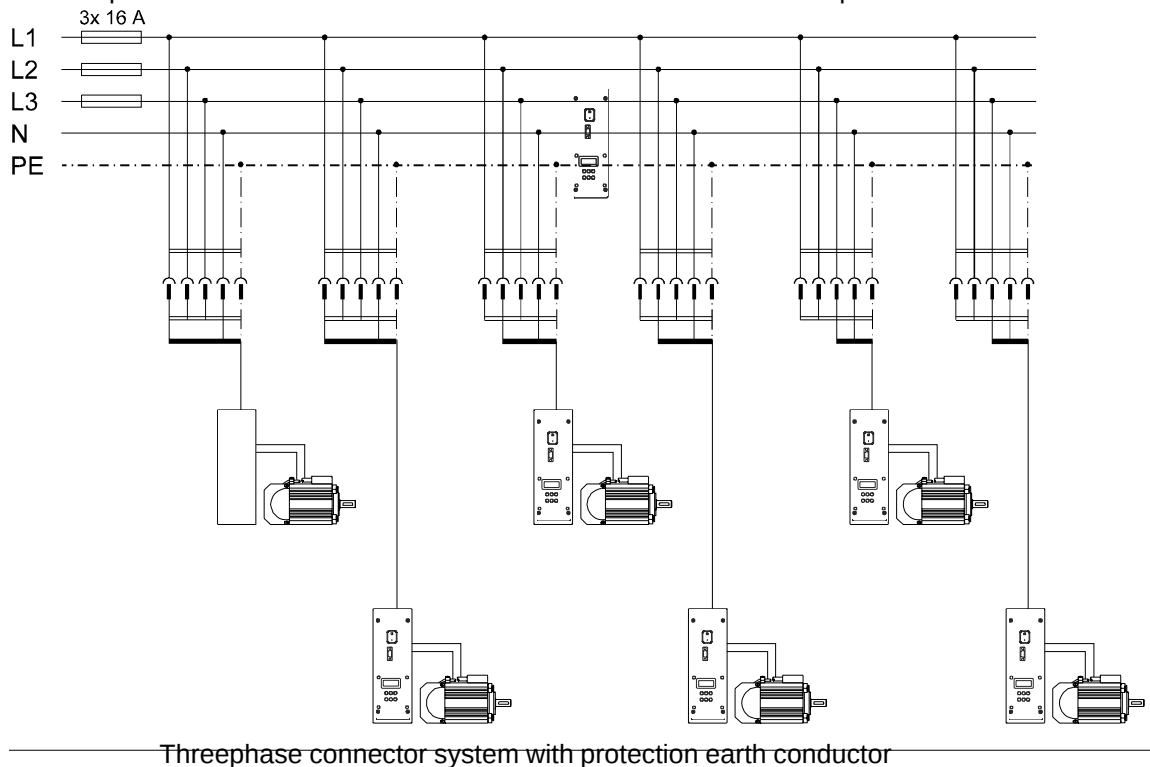
All elements apt to be touched simultaneously must be connected to a common earthing.

The following applies additionally to IT systems:

No active conductor within the installation is permitted to be earthed directly. All elements must be connected individually, in groups, or in total with a protection earthing conductor.



Do not operate more than 5 EcoDrives on one circuit fused with 16 amps.



Make sure to distribute loads evenly in a threephase AC system!

Do not operate more than 3 EcoDrives on one face fused with 16 amps in order not to overload the N-conductor!

The EcoDrive is a protection class I device, i.e. for protection at indirect touching it comprises a protection earth connection.



The EcoDrive is permitted to operate only in a properly functional protection earth system in compliance with all local rules and regulations in order to avoid danger to persons by electric shock or fire hazards in case of malfunction.

It is not permitted to disable the protection system by using extension cables not equipped with a protection earth conductor.



Caution: Any interruption of the protection earth conductor within the EcoDrive or outside, or by disconnecting the protection earth connection, can result in making the equipment hazardous.
Any intentional interruption is inadmissible.

Fault Current Protection Devices

If any EcoDrives are to be monitored via fault current protection devices, then the latter must be shock puls proof, short pulse delayed as well as suited for alternating and pulsating constant fault currents.

For connections, use line types not lighter than plastic- insulated sheathed flexible cables H05 VV. The minimum conductor cross section must be 1 mm², with the line length not in excess of 5 m. The voltage drop in the protection earth conductor is not permitted to exceed 3.3 V at a measuring current of 10 amps.

Any lines installed must be properly protected against anticipated loads and must be properly fastened.

Place and attach lines so as to maintain a minimum distance of 25 mm relative to any moving parts.

Place lines, mains power leads and low voltage circuits at a proper distance from each other to achieve adequate separation.

For replacement make sure to use exclusively fuses of the type and current rating specified.

Any bridging-over of fuses is inadmissible and will create electrical or fire hazards.

If there is reason to presume that operation without hazards will not be possible, discontinue operation of the drive system and safeguard the equipment against inadvertant use.

Reasons to presume that operation without hazards will not be possible are as follows:

- if the drive system presents visible damage, for instance mains power connection cable,
- if the drive system fails to function,
- after lengthy storage at unfavourable conditions.

The control box may be opened only by properly qualified personnel and after having separated the drive system from mains power by pulling the plug out. (After switching the system off, wait at least 10 minutes.)

Insert and lock carefully the connectors on the control system after having checked the pin and socket configuration and the plug-in direction, to avoid malfunction.

The brake action will not be initiated when mains power supply is switched off or power failure occurs during operation of the EcoDrive.



When leaving the workplace or when doing maintenance work, separate the machine from mains power by pulling out the plug. For this, do not pull at the cable, but grip the plug and pull it out.

Before separating the EcoDrive from mains power, bring all control elements into „OFF“ or „0“ position.

6.4 Electro-Magnetic Compatibility (EMC)

The EcoDrive is designed for installation/attachment to EMC sewing units and equipment, i.e. it complies with the relevant EMC regulations (CDV IEC 204-3-1 44 sec 169) for a cable length of 500 mm at each input or output connector. In accordance with experience, this is adequate for sewing units.

More complicated sewing equipment may require additional action due to longer cables, unfavourable cable placement, neighbouring strong interference fields etc.

The following action can be appropriate for reducing or eliminating interference:

- The use of appropriate filters, delay units, line material or line placement.
- Lines belonging to different circuits (such as mains power, low voltage) being placed at a proper distance from each other to minimize interference.
- Reference potential conductors for the circuits, or a common connection point: star-type wiring with one or more reference points earthed via insulated conductors having a large cross section.
- Electrically conductive parts of the sewing unit or equipment should be connected via potential compensation leads to the protection earth conductor on the EcoDrive control box. (Use leads suited for high frequencies: fine-gauge stranded leads with a cross section of at least 2.5 mm², or large-area copper bands.)
When connecting potential compensation leads, make sure to achieve good contact, i.e. use toothed washers for connections to painted parts.

Include the following parts in potential compensation:

- sewing machine head
- sewing machine stand
- treadle
- housings of solenoids or solenoid valves
- holding brackets for push-button switches
- stands for stackers, band feeders etc.
- Mass Connections
Lead mass connection lines from each equipment element to a common point.
Use large cross section braided leads between moving parts and casings while keeping mass connection as short as possible.
- Signal Transmission
Use electrostatic and magnetic screening, twisted conductors and appropriate line placement to ensure that transmission of interference voltages from control or mains power lines to signal lines is prevented.
(Right-angle line crossings are better than any lower angles; by all means avoid parallel placement.)
- Separation of Equipment Parts
Equipment parts that are susceptible to interference parts (pulse-processing and/or low-level subassemblies) should be mounted separately from and/or be screened against switching devices such as electromagnetic relays, thyristors etc.
- Although being largely insusceptible to interference, the EcoDrive should not be operated in the immediate vicinity of HF welding devices or similar equipment to avoid malfunction.
- The EcoDrive is capable of complying with EMC regulations only when the control box front is provided with its cover!
- The covers of the control box must remain closed during operation in order to avoid malfunction due to EMC causes as well as pollution by dust penetration.

Whenever trouble should occur, please contact the manufacturer.

6.5 Mounting of the Speed Control Unit (SWG)

- Attach the speed control unit by means of the mounting bracket under the machine table.
- Connect the push/pull bar of the SWG with the machine treadle by means of a pitman rod.
- Install the mounting bracket for the SWG in such a way that the pitman rod and the push/pull bar of the speed control unit (SWG) line up to the treadle.
This guarantees a optimal force transmission from treadle to SWG.
- The pitman rod and the treadle should form an angle as close to 90 degrees as possible.
- The speed control unit can be swivelled on the control box within a range of 40 degrees.
- Make sure that the treadle can move with ease!

EcoDrive

QE3760/QE5540

CE

Type

P40ED

Instruction Manual

Part 2

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Englisch 2004-03-08

List of Contents Part 2

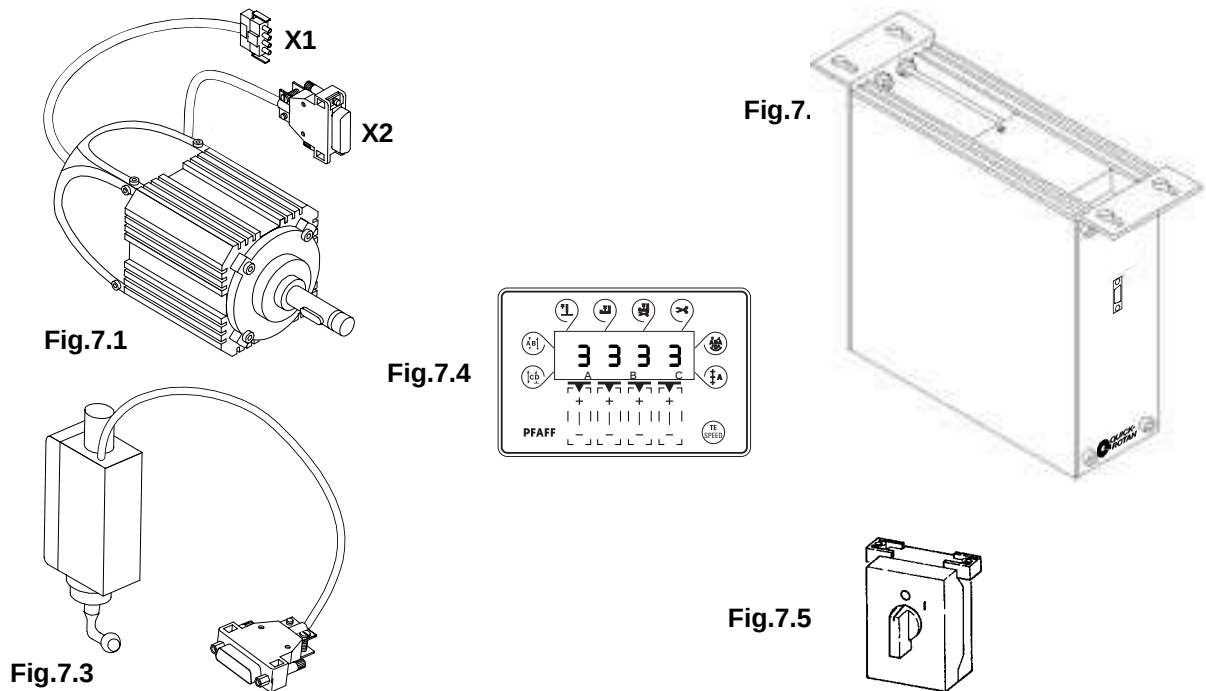
Chapt.	Contents	Page
7.	Description of the EcoDrive drive system	7.1 - 7.5
7.1	Motor QE3760 / QE5540	
7.2	Control system	
7.3	Speed control unit SWG2	
7.4	Control panel S1	
8.	Application	8.1 - 8.4
8.1	Entering the start and end backtacks	
8.2	Sewing	
8.3	Darning program	
8.4	Counted seam	
8.5	Error Messages	
9.	Error codes (malfunction diagnostics)	9.1 - 9.5
9.1	Parameter settings	
9.1.1	Selecting the user level	
9.1.2	Example of a parameter input	
9.2	Reset / Cold start	
10.	Start of operation	10.1 - 10.5
10.1	Control of the direction of rotation and of the reference position from the needle bar (needle position NPO)	
10.2	Control of the needle positions NP1 / NP2	
10.3	Control of the maximum speed	
10.4	Hardware test	

Technical updatings reserved!

7. Description of the EcoDrive Drive System

The EcoDrive Drive System is an electronically commutated, brushless DC motor.

The system is composed of the following subassemblies



Motor QE3760 / QE5540 (Fig.7.1) with integrated optoelectronic incremental encoder for commutation and positioning.

Control (Fig.7.2) with

- mains connection with interference rejection circuit
- electronically controlled combinational circuit
- intermediate DC circuit
- motor-driven current inverter
- electronic control for motor control and machine specific functions
- connection for a sewing light

Speed control unit SWG2 (Fig.7.3)

Control panel S1 (Fig.7.4)

Mains switch located under the desktop table (**Fig.7.5**)

7.1 Motor QE3760/QE5540

The motor is a synchronous motor. It has a permanent-magnetic rotor, a stator with three-phase winding and an optoelectronic increment encoder for commutation and positioning.

The rated capacity of the motor (shaft capacity) is 375W (QE3760), 550W (QE5540) in S5 mode.

The rated speed of the motor is 6000 rpm (QE3760), 4000 rpm (QE5540), the maximum speed is 9000 rpm (QE3760), 4500 rpm (QE5540).

The motor has two mains leads:

- four-wire with special quadripolar AMP plug (X1 Fig.7.1) for connecting the stator coil to the control system
- six-wire shielded with nine-pole D-sub plug (X2 Fig.7.2) for connecting the increment encoder to the control system.

7.2 Control system

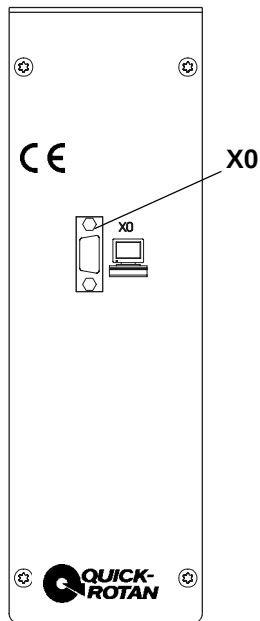


Fig. 7.6

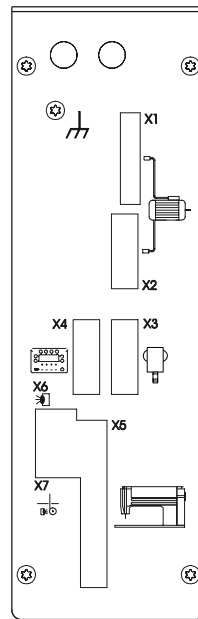


Fig 7.7

The control box is attached to the underside of the machine table by means of the four enclosed screws.

The mains connection is single-phase, using the three-wire cord protruding from the rear and a standard safety plug.

The control system has peripheral functions:

on the front panel (Fig. 7.6):

X0 nine-pole D-sub jack for data transfer

on the rear panel (Fig. 7.7):

sockets or connector plugs

X1 quadripole socket for connecting the motor's stator coil

X2 nine-pole D-sub jack for connecting the motor's increment encoder

X3 nine-pole D-sub plug for connecting set point adjuster SWG2 (Art. No. 63.012)

X4 nine-pole D-sub plug for connecting the control panel OC-TOP/AP (Art. No. 64.175)

X5 37-pole D-sub jack for connecting the process control system (keys, switches, solenoids, solenoid valves) on the machine.

X6 six-pole RJ45 western jack for connecting from a light barrier

X7 six-pole RJ45 western jack for connecting from a bobbin thread supply monitor

In function, the control is connected with the sewing machine/sewing unit via:

Inputs (Ex), e.g. for push-buttons, switches, proximity switches, detectors, and

Outputs (Ax), e.g. for solenoids, solenoid valves, signal indicators.

7.3 Encoder SWG2

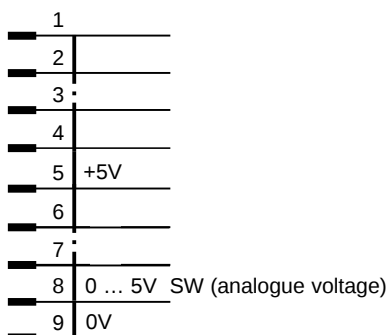
the SWG2 is attached under the table with the provided bracket and mechanically connected with the pedal of the machine with the provided linkage.

Electrical connection of the SWG2 is made with the nin-pin coupling on plug X3 on the rear side of the control.

The SWG2 is an analog mechanical-electrical converter that converts the pedal stroke into voltage. This analog output voltage of the SWG2 is digitised in the control so that the pedal stroke is divided into 16 steps (positions).

Level	Position	Voltage [V]	Meaning
0	-2	0,00 - 0,50	Seam end, thread trimming
1	-1	0,50 - 0,94	Presserfoot up
2	0	0,94 - 1,76	Treadle position 0
3	+1	1,76 - 2,21	Presserfoot down
4	+1 D	2,21 - 2,43	Speed n1
5	+2 D	2,43 - 2,66	Speed n2
6	+3 D	2,66 - 2,90	Speed n3
7	+4 D	2,90 - 3,13	Speed n4
8	+5 D	3,13 - 3,37	Speed n5
9	+6 D	3,37 - 3,60	Speed n6
10	+7 D	3,60 - 3,84	Speed n7
11	+8 D	3,84 - 4,07	Speed n8
12	+9 D	4,07 - 4,31	Speed n9
13	+10 D	4,31 - 4,54	Speed n10
14	+11 D	4,54 - 4,78	Speed n11
15	+12 D	4,78 - 5,00	Speed n12

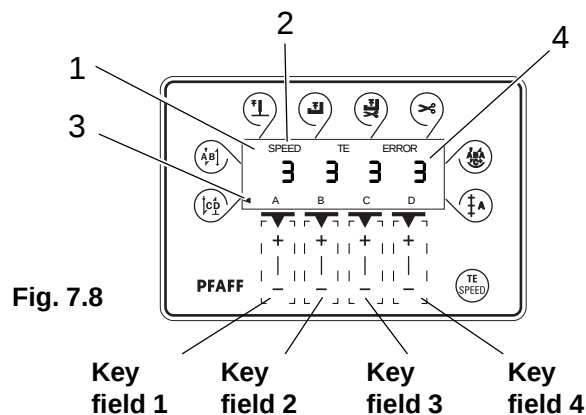
contact connections of connection plug (X3) of the SWG2



7.4 Control panel

The control panel (**Fig. 7.8**) consists of **display 1** and the function keys described below. The display 1 consists of a single-line, 7 segment LCD display with 8 symbols. The **texts 2**, located above and next to the LCD display, show the respective status of the function keys and the operating status of the machine. The control panel switches on all LCD-segments and the horn automatically for a short time during the power-on phase, after which the lettering PFAFF appears on the display, until the higher-ranking control unit sends commands to the control panel.

The function keys are located around the display 1. They are foil-packed without permanent marking and without contact signal. Fixed functions are allocated to the keys, see Chapter 7.4.2 Function keys.



7.4.1 Screen displays

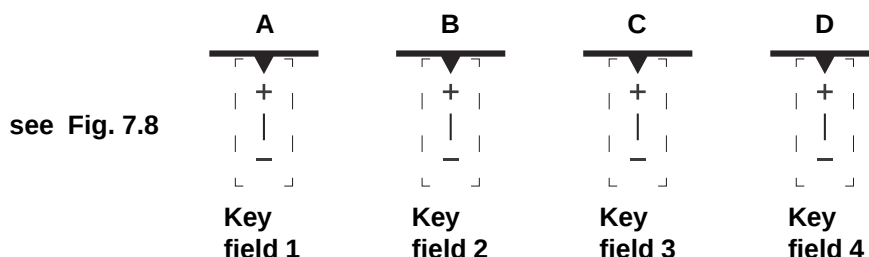
Activated functions are displayed with a triangular **marking 3** below or next to the respective function key.

In the sewing mode all relevant sewing data is displayed and can be changed directly, depending on the status of the machine, see also Chapter 8.2 Sewing.

During the parameter input the selected parameter number with the corresponding value is displayed.

7.4.2 Function keys

The function keys (**Fig.7.8**) described below are used basically to switch machine functions on and off. Each time a key is pressed, this must be confirmed by at least one beep tone. Irrespective of the machine mode a double beep signal is given if invalid keys are pressed or maximum values reached. If a corresponding value has to be set for the activated function, this is carried out with the corresponding +/- key. By pressing and holding the corresponding +/- key, the relevant numerical **value 4** is changed slowly to begin with. If the corresponding +/- key is held down longer, the values change more quickly.



Start backtacks

If this key  is pressed, the backtacks at the beginning of the seam (start backtacks) are switched on or off. The number of forward stitches (A) or reverse stitches (B) for the start backtacks can be changed by pressing the +/- key underneath. To convert from double backtick to single backtick set the number of stitches for the corresponding seam section at zero.

End backtacks

If this key  is pressed, the backtacks at the end of the seam (end backtacks) are switched on or off. The number of reverse stitches (C) or forward stitches (D) can be changed by pressing the +/- key underneath. To convert from double backtick to single backtick set the number of stitches for the corresponding seam section at zero.

Needle position

If this key  is pressed the „needle raised after sewing stop“ function is switched on or off. When the function is switched on, the needle positions at t.d.c. after sewing stops.

Foot position after stop

If this key  is pressed the „foot raised after sewing stop“ function is switched on or off. When the function is switched on, the presser foot is raised after sewing stops.

Foot position after trimming

If this key  is pressed the „foot raised after thread trimming“ function is switched on or off. When the function is switched on, the presser foot is raised after thread trimming.

Thread trimmer

If this key  is pressed the thread trimming function is switched on or off.

Darning program

If this key  is pressed the darning program function is switched on or off. The counted seam function is switched off automatically.

Counted seam

If this key  is pressed the counted seam function is switched on or off. The darning program function is switched off automatically.

TE/Speed

If this key  is pressed once the speed limit for the sewing mode is activated.

If this key  is pressed twice (within 5 seconds) the machine changes from sewing to input mode.

8. Application

This **EcoDrive drive** can be used **with the external operator's control panel S1**.

Switching on

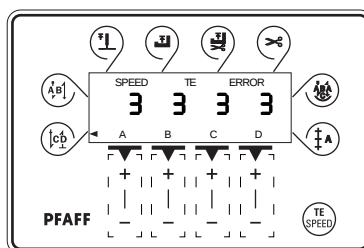
The on/off switch (mains switch) is located under the sewing machine table. When activated and live, an control lamp at the switch lit up.

Maximum speed

The maximum speed can be adjusted with the control panel S1.
Press the TE/Speed key once to call up the speed input mode.

8.1 Entering the start and end backtacks

Switch on the machine.



If necessary switch off the "darning seam" or "counted seam" function, see Chapter 8.3 Darning program or Chapter 8.4 Counted seam.

By pressing the corresponding +/- key ("A") select the desired value for the number of forward stitches (A) of the start backtack.

By pressing the corresponding +/- key ("B") select the desired value for the number of reverse stitches (B) of the start backtack.

By pressing the corresponding +/- key ("C") select the desired value for the number of reverse stitches (C) of the end backtack.

By pressing the corresponding +/- key ("D") select the desired value for the number of forward stitches (D) of the end backtack.

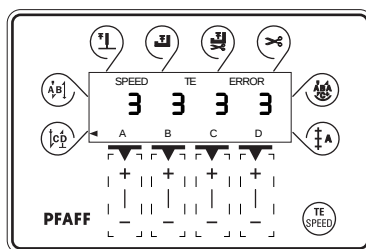
By pressing the keys start backtack  and/or end backtack , activate the corresponding function (arrow appears next to the corresponding function key).

8.2 Sewing

In the sewing mode all relevant settings for the sewing operation are displayed. Functions can be switched on or off by pressing a key. Values for start and end backtacks or stitch placement can be changed directly.

When the machine is switched on, the sewing mode is always activated.

Switch on the machine.



If necessary switch off the function "darning seam" or "counted seam", see Chapter 8.3 Darning program or Chapter 8.4 Counted seam.

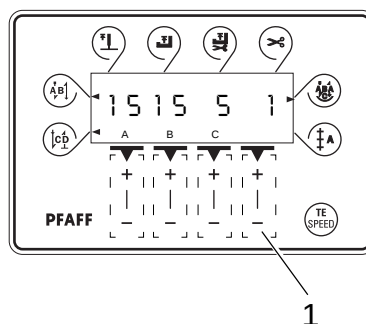
Functions in manual sewing, also see Chapter 7.4.2 Function keys:

- | | |
|---|---|
|  Start backtacks on/off |  Presser foot raised at end of seam on/off |
|  End backtacks on/off |  Thread trimming on/off |
|  Needle position raised on/off |  Darning program on/off |
|  Presser foot raised on/off |  Counted seam on/off |

Sewing is carried out with the pedal functions.

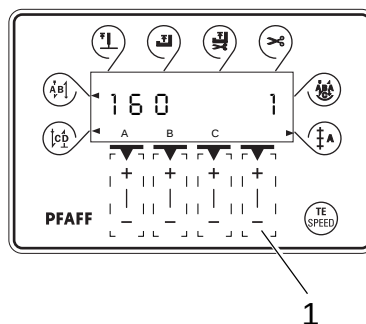
The "Darning program" and "Counted seam" functions are explained in more detail in Chapter 8.3 Darning program or Chapter 8.4 Counted seam.

8.3 Darning program



The corresponding function can be switched on or off directly with the Darning program key. The "counted seam" function is switched off automatically. Several darning programs with different seam sections A and B can be selected. The number of required darning programs can be selected by operating the +/- key 1. The number of stitches for the individual seam sections A and/or B can be selected by operating the corresponding +/- key. By operating the corresponding +/- key it is possible to select a repeating factor "C" for the selected darning program. If the backtack functions are also activated, only the status backtack on or backtack off is displayed. The individual backtack parameters can be altered after the "darning program" function has been switched off, see Chapter 8.1 Entering start and end backtacks.

8.4 Counted seam

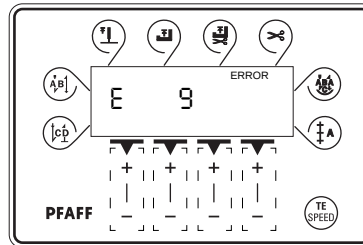


The corresponding function can be switched on or off directly with the Counted seam key. The "darning program" function is switched off automatically. Several counted seam sections can be selected. The number of required seam sections can be selected by operating the +/- key 1. The required number of stitches "A" of the selected seam section can be selected by operating the corresponding +/- key. If the backtack functions are also activated, only the status backtack on or backtack off is displayed. The individual backtack parameters can be altered after the "counted seam" function has been switched off, see Chapter 8.1 Entering start and end backtacks.

8.5 Error messages

If a fault occurs, the text "ERROR" appears on the display, together with an error code and short instructions. An error message is caused by incorrect settings, faulty elements or seam programs as well as by overload conditions.

For an explanation of the error codes see Chapter 9.



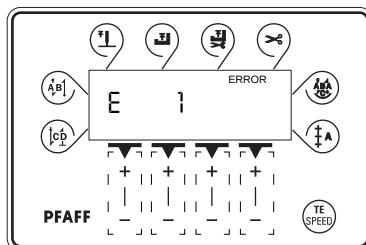
Correct the error.

Acknowledge error correction by pressing the TE/Speed key.

9 Error Codes (Malfunction Diagnostics)

The control system of the drive cyclically tests its own functional condition and the functional condition of the complete drive system.

Malfunctions are signalled via the display of the external control panel, for instance:



Summary of the malfunctions:

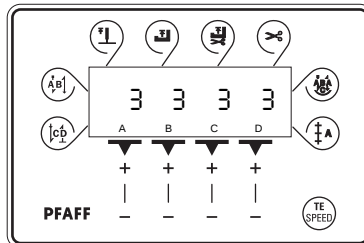
Malfunction-No.	Reason	Remedy
1	Treadle not in zero position when mains power is turned ON.	Bring treadle in zero position, check the treadle, connect the Speed control unit.
9	Start lock is active.	Eliminate cause.
10	Machine class (<799>) was changed.	Turn mains power switch OFF and ON again.
62	Short circuit on 24 V (32 V) DC.	Find short circuit and eliminate it Turn mains power switch OFF and ON again.
63	Overload on 24 V (32 V) DC, load current > 4 amps.	Turn mains power switch OFF and ON again search component (magnet), what was the reason why. Adjust new the magnet or change it.
64	voltage too low (90 V - 150 V) (U < 150V).	let check the voltage from a specialist.
65	Power electronics not operational after mains power ON, mains power < 130V.	Turn mains power switch OFF and ON again, if the malfunction still happens, then change the control box.
66	Earth short (motor or motor supply line has earth short in one or more phases).	Change the control box or the motor.
67	Internal malfunction	Change the control box.

Malfunction-No.	Reason	Remedy
68	Power electronics shut-off when motor runs why: a) Overcurrent, short circuit in motor or supply line b) Overvoltage, mains voltage too high (>300 V), motor overloaded while decelerating c) Undervoltage	Eliminate cause.
70	Machine blocked, no increment from synchronizer at max. motor torque.	Eliminate cause.
71	Commutation transmitter plug not inserted	Insert commutation transmitter plug
73	Motor overloaded.	Eliminate cause.
75	Internal malfunction: governor blocked.	Change control box.
92	Start lock while motor running.	Eliminate the causing input signal and turn mains power switch OFF and ON again.
93	Wrong EEPROM.	Change EEPROM.
100	Internal malfunction.	Change control box.
111		
173	Governor disturbance: Startangle within control time not reached.	Turn hand wheel into needle position 2 (link take-up up), turn mains power switch OFF and ON again, start new. Raise value for parameter <880>

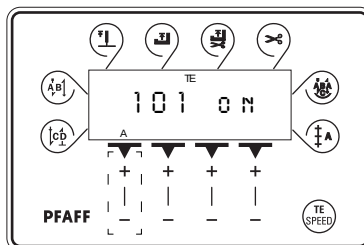
9.1 Parameter settings

9.1.1 Selecting the user level

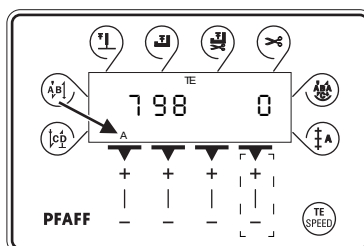
Switch on the machine.



Press the TE/Speed key  twice to call up the input mode.



By pressing the corresponding +/- key  select the parameter group "798".



By pressing the corresponding +/- key select the desired user level:

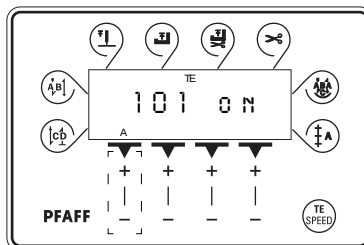
- "0" = operator level A
- "1" = technician level B
- "11" = service level C

The selected user level is displayed on the screen. (see arrow).

9.1.2 Example of a parameter input

Switch on the machine.

Press the TE/Speed key  twice to select the input mode.

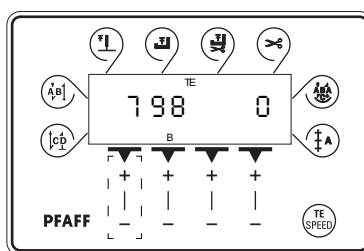


By pressing the corresponding +/- key
the user level "B",

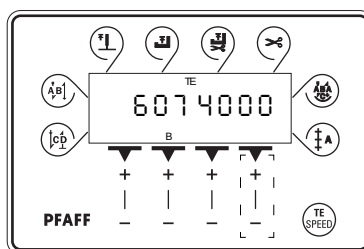


select parameter "798" and

see Chapter 9.1.1 Selecting the user level.



Select parameter "607" by pressing the corresponding +/- key



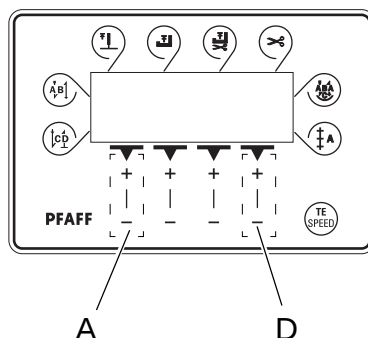
Select the required value for the maximum speed by pressing the corresponding +/- key.

By pressing the TE/Speed key  the selected value is taken over and the machine switches to the sewing mode.

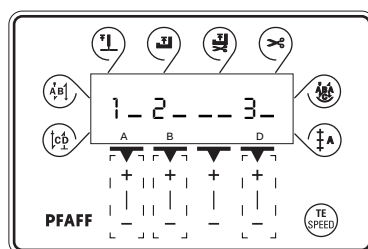
9.2

Reset / Cold start

After selecting the reset menu, by pressing the corresponding key it is possible to reset seam parameters, reset seam programs and to execute a cold start.



Press and hold "+" on keys A and D and switch on the machine!



A Resetting the seam parameters

Press "+" on key "A".

All parameters are deleted, the display "—rE—" appears for a short time on the screen.



B Resetting the seam programs

Press "+" on key "B".

All seam programs are deleted, the display "—rE—nA" appears for a short time on the screen.



D Cold start

Press "+" on key "D".

With the exception of the value for the machine class, the values of the machine control unit are set back to their basic values, the display "—COLd—" appears for a short time on the screen.



After the cold start all programmed values are set back to their status at the time of delivery. For this reason after a cold start it is necessary to re-enter first the parameter "799" and then the parameter "700".

10. Start of operation

If the **EcoDrive** has been stored at a temperature of $<+5^{\circ}\text{C}$, then a working temperature of between $+5^{\circ}\text{C}$ and $+40^{\circ}\text{C}$ must first be obtained.
The equipment must be dry.

Before work with the machine can be started, make sure to perform the following:

- a) Control the direction of rotation and the reference position of the needle bar
- b) Control the needle positions
- c) Control the maximum speed

10.1 Control of the direction of rotation and of the reference position from the needle bar (needle position NPO)

- a) Activate programming level „b“ (technician level) (see section 9.1.1 „Selecting the user level „b““)
- b) Set parameter 700
- c) Actuate treadle briefly forward:
Reaction: The machine performs a full revolution and then positions in a random position.
- d) Is the direction of rotation correct?
When yes, then proceed to adjust the reference position, proceed with e) below
If no, then activate parameter 800 and change the value $<800>$ (on $\rightarrow$ off or off $\rightarrow$ on)
than proceed as b)
- e) Turn the handwheel of the machine in the direction of rotation until the **point of the needle coming from up** to down touches the level of the throat plate (= reference position).
- f) Actuate the treadle briefly forward:
Reaction: The machine performs one revolution and positions in the same position that had been previously obtained by hand.
- g) As soon as new parameter numbers are activated, or the programming level „b“ is negated, then the parameter value $<700>$ is memorized and the reference position adjustment is completed.

10.2 Control of the needle positions NP1 / NP2

NP1 - needle down position ($<702>$)

NP2 - thread take up lever in the up position ($<703>$)

- a) Activate programming level „b“ (technician level)
(see section 9.1.1 „Selecting the user level „b““)
- b) Activate parameter 702
- c) Actuate the treadle briefly forward
Reaction: The machine performs a revolution and then positions at the programmed $<702>$
- d) Is the needle position correct?
When yes, then proceed as with g) below.
When no, then the position must be changed
by turning the hand wheel or
via key field 3 +/- or field 4 +/- (see section 7.4.2) at the **control panel S1**
- e) Actuate the treadle briefly forward
Reaction: The machine performs a revolution and positions in the same position

- f) The position can again be corrected.
When no further correction is needed, then proceed as with g) below.
- g) As soon as another parameter number is called up, e.g. example 703, the previously programmed value of <702> is memorized.
- h) With parameter 703 correction is obtained as described above for parameter 702.
- i) Deactivate programming level „b“
(see section 9.1.1 and 9.1.2 „Selecting the user level „b““).

10.3 Control of the maximum speed

- a) Activate programming level „b“
(see section 9.1.1 "Selecting the user level „b““)
- b) Set to parameter 607
- c) Check the parameter value <607> and make correction if necessary via
key field 3 +/- or key field 4 +/- at the **control panel S1**
- d) Deactivate programming level „b“
(see section 9.1.1 and 9.1.2 "„Selecting the user level „b““).

10.4 Hardware Test

Hardware Test is a check routine permitting to use the control panel **S1** for testing various components of the drive system (control system) and of the machine installation.

Activation of the „HARDWARE TEST“ = „HW-Test“ routine

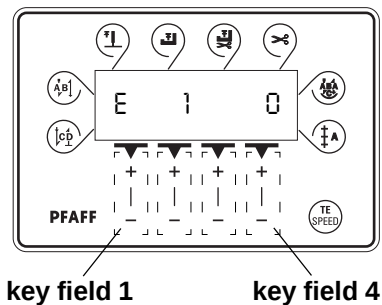
- push key TE-SPEED two times
- to activate programming level „c“ set parameter <798> to 11 (see section 9.1.1 and 9.1.2 „programming level „b“).
- at programming level „c“, call up parameter 797
- Set <797> from **OFF** to **ON** with **key field 4**

After that, the display shows the first test block: Inputs.

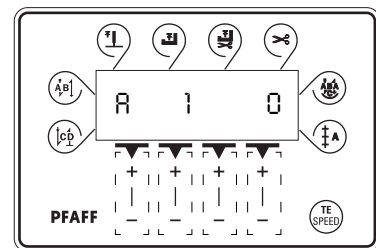
Response: The display shows:

Survey of test blocks:

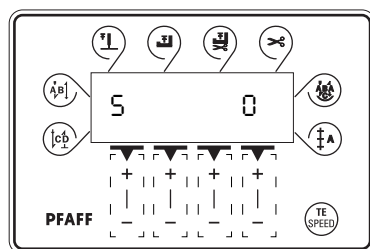
1 Inputs



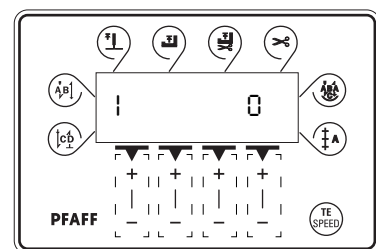
2 Outputs



3 Speed controlunit



4 Synchronizer



To call up the test blocks (advancing from test block to test block),

use **key field 1**

Hint: further indications on the display are for optional functions!

To activate functional elements selected, use **key field 4 +/-** on the **control panel S1**.

[illegible]

The designations E (for input) are located on the lefthand side of the connectors shown.
The keys or selectors assigned to the inputs are designated S in the connections diagram and have the same numbers as the associated inputs, i.e.

- key S1 is connected to input E1
- key S2 is connected to input E2
- key Sx is connected to input Ex.

In the righthand part of the display, the connecting plug and the pin number to which the displayed input is connected are shown for the purpose of reference.

The diagram shows the PFAFF control panel with three labels pointing to specific features:

- Output:** Points to the first output button (1).
- Output no.:** Points to the central display area showing the number 1.
- State of output:** Points to the output status indicator (1A).

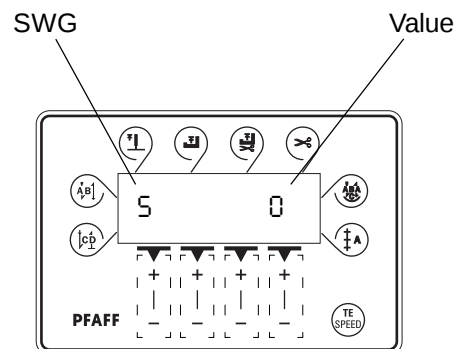
04-03-08

The designations A (for output) are located on the lefthand side of the connectors shown.
 The solenoids/solenoid valves assigned to the outputs are designated Y in the connections diagram and have the same numbers as the associated outputs, i.e.
 solenoid Y2 is connected to output A2
 solenoid Y3 is connected to output A3
 solenoid Yx is connected to output Ax

The operating state of the output displayed is signalled in the 7th digit of the display.
 Output not activated → display: 0
 Output activated → display: 1

To activate an output, use key field 4 +/-.

Test block 3: Speed control unit (SWG)
 Display:

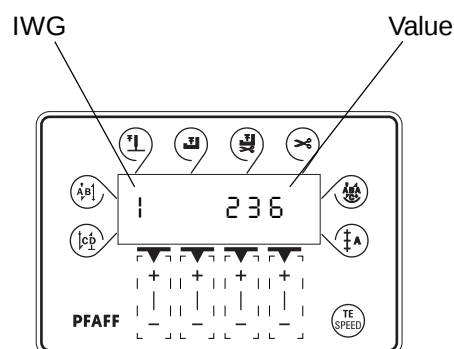


The treadle can be actuated to operate consecutively all 16 steps of the speed control unit.

The following is displayed in digits 6, 7 and 8

-2 / -1 / 0 / +1 / 10 / 20 / ... / 120, when the speed control unit is in proper condition.

Test block 4: Synchronizer (IWG)
 Display:



This test block permits to check the synchronizer (increment encoder). For this purpose, the shaft of the motor must be rotated manually.

The increments (pulses) of the synchronizer are counted and shown in display digits 4, 5 and 6.
 This display runs from 0 through 255 when the synchronizer is in proper condition.

To deactivate the test routine,
 turn the mains power switch OFF, or press the TE/Speed key  twice.

EcoDrive

QE3760/QE5540

CE

Type

P40ED

Instruction Manual

Part 3

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Englisch 2005-10-25

List of Contents Part 3

Chapt. Contents	Page
11. Survey and List of Parameters	11.1 - 11.9
11.1 Explanation of Parameter Survey	
11.2 Explanation of Parameter List	
11.3 Parameter Survey	
11.4 List of Parameters	
12. Electrical Connections Diagram	12.1 - 12.4
Appendix adaptor cable	12.5

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, 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.

Parameter numbers in acute brackets; e.g. <105>, mean the value (content) set for the parameter in question.

Example:

107 Speed for front backtack when <106> = I

I limited by <105>

II limited by <607>

Explanation:

Parameter 107 is valid only the the value (content) of parameter <106> = I.

If parameter 107 is set to I (<107> = I), then the speed for the front backtack is limited by parameter 105, e.g. <105> = 1500. If parameter 107 is set to II (<107> = II), then the speed for the front backtack is limited by the value of parameter 607, e.g. <607> = 4000.

11.3 Parameter survey P40ED 1_040_10 (PARAM.ENO)

Function	Abbrev'n	Parameter	Input Output	Connection Socket/Contacts
Accelerate	DRZAN	722		
Backtack	RIE	105/107/110 364/391/523 584/585		
Backtack inversion	RIV	748		
Backtack suppression	RIUNT	748		
Blower	BLA	668		
Brake	DRZAB	723		
Catcher	FANG	707		
Chopper	MESSER	105/110		
Control	REG	880/884/885 886/887/889 890/900		
Decorative backtack	ZRIE	391/522/523 530/775		
Defect search	HWT	797		
Delay	VERZ	623/642/643 730/761/770 939		
Direction of rotation	DRR	800		
Display	ANZ	605/933		
Edge trimmer	KS	356/387/776		
End backtack	ER	110		
Engine	MOT	897		
Feed reverse	TUM	301/364/643 721/757/939		
Front backtack	AR	105/106/107		
Hardware test	HWT	797		
Inverse rotation	RDR	618/623/801		
Machine class	MAKL	799		
Machine run	ML	387		
Needle position	NAPO	522/700/702 703/705/706 707/710/746 748		

Needle position change-over	NPW	446/748
Needle up without trimming	NHOS	446/710/748
Number of stitches	STZA	111/112/470 760
ON period	EINZ	528/715/889
Operator panel	BDF	101
Photocell	LS	111/112/113 163/199/615
Presser foot	PF	356/636/642 651/719/729 730/770
Program	PR	203/206/311 313
Programming level C	EBC	798
Residual brake	STBR	718
Seam end	NE	110/206
Seam start	NA	105
Single stitch	EST	392/446/748
Soft start	SANL	116/117
Speed	DRZ	105/106/107 110/117/199 203/530/585 605/606/607 608/609/901
Speed decrease	DRZAB	723
Speed increase	DRZAN	722
Speed limitation	DB	585
Stacker	STAP	528/776
Start	START	113
Start delay	STVERZ	729
Stitch condensation	STVD	105/106/107 110/364
Stitchcounter	STZ	760
Stop	STOP	206
Stop time	STOPZ	775
Target stitch	PEIPO	653/789
Thread clamp	FK	470

Thread monitor	FW	382/660/760
Thread puller	FZ	761
Thread tension release	FSL	393/538/636 707/761
Thread trimming	SN	311/609/646 705/706/734 901
Thread wiper	WI	668/715
Time needed to switch on	EINZ	528/715/889
Timing output	TA	538/642/643 705/719/721 734
Vacuum	SAUG	105/110/356
Zigzag machine	ZZ	746

11.4 List of Parameters P40ED 1_040_10 (PARAM.EN)

No.	Function (Meaning)	Level	Range Values	of Value	Standard
101	(BDF) Audible signal of the control panel pushbutton 1 = on 0 = off	A,B,C		1	Kl. 1, 2, 3, 4
105	(AR/RIE/DRZ/MESSER/NA/SAUG/STVD) Speed for front backtack/ stitch condensation	B,C	0300 - 2000 0300 - 2000	1200 700	Kl. 1, 3, 4 Kl. 2
106	(AR/DRZ/STVD) Speed for front backtack/stitch condensation 1 variable (treadle-controlled) 0 constant (corresponding to <105>)	B,C		0	Kl. 1, 2, 3, 4
107	(AR/RIE/DRZ/STVD) Speed for front backtack/stitch condensation when <106> = I 1 limited by <105> 0 limited by <607>	B,C		0	Kl. 1, 2, 3, 4
110	(ER/RIE/DRZ/MESSER/NE/SAUG/STVD) Speed for end backtack/ stitch condensation	B,C	0300 - 2000 0300 - 2000	1200 700	Kl. 1, 3, 4 Kl. 2
111	(LS/STZA) Light barrier compensation stitches 1 (stitches from light barrier clear to seam end)	A,B,C	0001 - 0030	8	Kl. 1, 2, 3, 4
112 3, 4	(LS/STZA) Number of stitches for light barrier fade-out on knit fabrics (according to stitch size)		A,B,C	0000 - 0100	0 Kl. 1, 2,
113	(LS/START) Start with light barrier 1 when light barrier is dark only 0 also when light barrier is clear	B,C		0	Kl. 1, 2, 3, 4
116	(SANL) Soft start stitches	A,B,C	0000 - 0030	0	Kl. 1, 2, 3, 4
117	(SANL/DRZ) Speed for soft start stitches	B,C	0030 - 0640	400	Kl. 1, 2, 3, 4
163	(LS) Sewing with photocell 1 yes 0 no	B,C		0	Kl. 1, 2, 3, 4
199	(DRZ/LS) Speed for light barrier compensation stitches	B,C	0300 - 2000	1200	Kl. 1, 2, 3, 4
203	(PR/DRZ) Speed for seam program 1 variable (treadle-controlled) 0 constant (corresponding to <221> or <222>)	B,C		1	Kl. 1, 2, 3, 4
206	(NE/PR/STOP) Interrupt/discontinue seam sections at speed = constant (<203> = II) 1 with treadle -2 0 with treadle 0	B,C		0	Kl. 1, 2, 3, 4
301	(TUM) Switch-on voltage of the magnet for transport change-over 1 24V 0 32V	C		0	Kl. 1, 2, 3, 4
311	(PR/SN) Cancellation of stitch count 1 with thread cutting 0 without thread cutting	B,C		1	Kl. 1, 2, 3, 4
313	(PR) Programs are backtack programs (darning programs) 1 yes 0 no	A,B,C		0	Kl. 1, 2, 3, 4
356	(PF/SAUG/KS) Input E4 is at 1 Presser foot 0 Vacuuming	B,C		1	Kl. 1, 2, 3, 4
364	(RIE/STVD/TUM) Transport change-over means for 1 Back-tack 0 Stitch condensation	B,C		1	Kl. 1, 2, 3, 4
382	(FW) Switching threshold of the analogue input for the thread monitor	B,C	0000 - 0100	15	Kl. 1, 2, 3, 4
387	(ML/KS) Output Ax (motor run) is active 1 With Pedal = 1D (Motor running) 0 With Pedal = 1 (Lower presser foot)	B,C		1	Kl. 1, 2, 3, 4

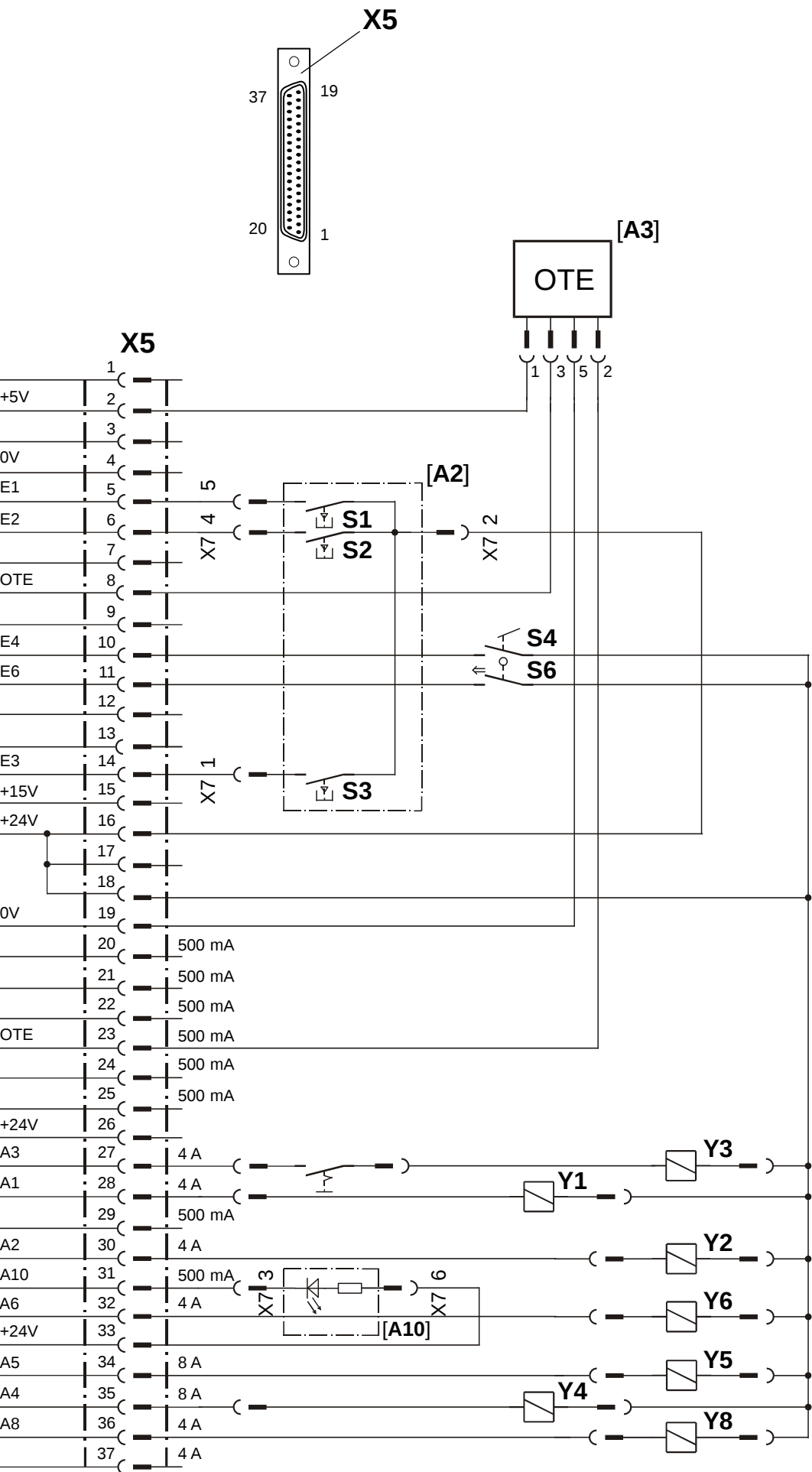
391	(ZRIE/RIE) single stitch-decorative backtack 1 = on 0 = off	B,C	0200 - 0700 450 -	Kl. 4 Kl. 1, 2, 3
392	(EST) Change-over to single stitch via treadle 1 = on 0 = off	B,C	0 -	Kl. 4 Kl. 1, 2, 3
393	(FSL) Thread tension release after seam end 1 = on 0 = off	B,C	1 0	Kl. 1, 2, 3 Kl. 4
407	Kein Kommentar vorhanden	B,C	1	Kl. 1, 2, 3, 4
446	(NHOS/NPW/EST) Input E2 is 1 = needle up without trimming 2 = needle position change-over 3 = single stitch 4 = single stitch with reduced length 5 = backtack inversion 6 = backtack suppression 7 = change-over position 8 = puller lift switched off	B,C	0001 - 0007 1	Kl. 1, 2, 3, 4
470	(STK/FK/STZA) number of stitches for disabling thread gripper	A,B,C	0000 - 0020 3 -	Kl. 4 Kl. 1, 2, 3
522	(NAPO/ZRIE) Needle position when stop occurs during decorative backtack (stitch in stitch) 1 position 2 (up) 0 position 1 (down)	B,C	0	Kl. 1, 2, 3, 4
523	(RIE/ZRIE) Backtack 1 decorative backtack (stitch in stitch) 0 standard backtack	A,B,C	0	Kl. 1, 3, 4 Kl. 2
528	(EINZ/STAP) Duration (ms) of stacker function	B,C	0000 - 2500 120	Kl. 1, 2, 3, 4
530	(DRZ/ZRIE) Speed (max.) for decorative backtack	B,C	0300 - 2000 1000 0300 - 2000 600	Kl. 1, 3, 4 Kl. 2
538	(FSL/TA) Timing of output Ax (thread tension release) (0 = 100%)	B,C	0010 - 0090 40 0010 - 0090 80	Kl. 1, 2, 3 Kl. 4
584	(RIE) Backtack 1 four times 0 double	B,C	0	Kl. 1, 2, 3, 4
585	(DRZ/DB/RIE) Speed limitation	B,C	0300 - 4800 1000	Kl. 1, 2, 3, 4
605	(DRZ/ANZ) Actual speed in display 1 yes 0 no	B,C	0	Kl. 1, 2, 3, 4
606	(DRZ) Speed: level 1 (min.)	B,C	0030 - 0300 180	Kl. 1, 2, 3, 4
607	(DRZ) Speed: level 12 (max.)	B,C	0300 - 6000 4000 0300 - 3200 3000 0300 - 5500 1000	Kl. 1, 3 Kl. 2 Kl. 4
608	(DRZ) Speed level curve (treadle characteristic) 1 linear 0 not linear	B,C	1 0	Kl. 1, 3, 4 Kl. 2
609	(SN/DRZ) Trimming speed 1	B,C	0060 - 0300 180 0060 - 0300 160	Kl. 1, 2, 3 Kl. 4
615	(LS) End recognition when photocell goes 1 from light to dark 0 from dark to light	B,C	0	Kl. 1, 2, 3, 4
618	(RDR) Inverse rotation after seam end 1 yes 0 no	B,C	0	Kl. 1, 2, 3, 4
623	(RDR/VERZ) Delay in start-up time (ms) for inverse rotation	B,C	0000 - 2000 30	Kl. 1, 2, 3, 4
631	Kein Kommentar vorhanden	B,C	0 -	Kl. 4 Kl. 1, 2, 3
636	(FSL/PF) thread tension release in conjunction with presser foot 1 yes 0 no	B,C	0 -	Kl. 1, 2, 3 Kl. 4

642	(PF/VERZ/TA) presser foot time from switch-on to voltage reduction (cycling)	B,C	0010 - 0150 100	Kl. 1, 2, 3, 4
643	(TUM/VERZ/TA) feed reverse time from switch-on to voltage reduction (cycling)	B,C	0010 - 0150 100	Kl. 1, 2, 3, 4
646	(SN) Without thread trimmer magnet at seam end 1 on 0 off	B,C	0	Kl. 1, 2, 3, 4
651	(PF) Presser foot with automatic descent on machine stop 1 yes 0 no	B,C	1	Kl. 1, 2, 3, 4
653	(PEIPO) Target stitch before sewing 1 yes 0 no	B,C	0	Kl. 1, 2, 3, 4
660	(FW) Bobbin thread monitoring 0 without (= *II*) 1 via a sensor (= **I*) 2 by a stitch count	A,B,C	0000 - 0002 0	Kl. 1, 2, 3, 4
668	(BLA/WI) Thread wiper/thread clearer 1 yes 0 no	B,C	0	Kl. 1, 2, 3, 4
694	Kein Kommentar vorhanden	B,C	0300 - 0800 500 -	Kl. 4 Kl. 1, 2, 3
700	(NAPO) Needle position 0 (reference position of the needle)	B,C	0000 - 0255 0	Kl. 1, 2, 3, 4 *
702	(NAPO) Needle position 1 (needle down)	B,C	0000 - 0255 90 0000 - 0255 15 0000 - 0255 80	Kl. 1 Kl. 2 Kl. 3, 4
703	(NAPO) Needle position 2 (thread take-up lever up)	B,C	0000 - 0255 236 0000 - 0255 230 0000 - 0255 226	Kl. 1, 3 Kl. 2 Kl. 4
705	(NAPO/SN/TA) Needle position 5 (end of trimming signal 1 (magnetic thread trimmer)/clock pulses start of the trimming signal 1)	B,C	0000 - 0255 200 0000 - 0255 140 0000 - 0255 100	Kl. 1, 2 Kl. 3 Kl. 4
706	(NAPO/SN) Needle position 6 (start trimming signal 2 (pneumatic thread trimmer))	B,C	0000 - 0255 136 0000 - 0255 15 0000 - 0255 100 0000 - 0255 80	Kl. 1 Kl. 2 Kl. 3 Kl. 4
707	(NAPO/FSL/FANG) Needle position 9 (thread tension release or thread catcher start)	B,C	0000 - 0255 164 0000 - 0255 195	Kl. 1, 3, 4 Kl. 2
710	(NAPO/NHOS) Needle position 3 (needle up)	B,C	0000 - 0255 184 0000 - 0255 206 0000 - 0255 212	Kl. 1, 2 Kl. 3 Kl. 4
715	(EINZ/WI) Duration (ms) of thread wiper	B,C	0000 - 2000 60	Kl. 1, 2, 3, 4
718	(STBR) Timing of residual brake (0 = brake off)	B,C	0000 - 0100 0 0000 - 0100 7	Kl. 1, 2, 3 Kl. 4
719	(PF/TA) Timing output A4 (lifting presser foot) (0 = 100% switched on)	B,C	0010 - 0060 40 -	Kl. 1, 2, 3 Kl. 4
721	(TUM/TA) Timing output A5 (feed reverse) (0 = 100% switched on)	B,C	0010 - 0090 40	Kl. 1, 2, 3, 4
722	(DRZAN) Acceleration ramp 1 gradual 50 steep	B,C	0001 - 0060 50 0001 - 0060 30	Kl. 1, 2, 3 Kl. 4
723	(DRZAB) Brake ramp 1 gradual 50 steep	B,C	0001 - 0060 40 0001 - 0060 27	Kl. 1, 2, 3 Kl. 4
729	(STVERZ/PF) Start delay after lowering presser foot	B,C	0010 - 2000 120	Kl. 1, 2, 3, 4
730	(PF/VERZ) Lift delay for presser foot after seam end	B,C	0000 - 2000 50	Kl. 1, 2, 3, 4
734	(SN/TA) Timing output A2 (thread trimmer) (0=100% switched on)	B,C	0010 - 0090 10 0010 - 0090 40 0010 - 0090 80	Kl. 1, 4 Kl. 2 Kl. 3
746	(NAPO/ZZ) Needle position for change-over, zick-zack or three-fold-stitch	B,C	0000 - 0255 90 0000 - 0255 20 0000 - 0255 80	Kl. 1 Kl. 2 Kl. 3, 4

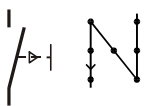
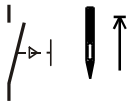
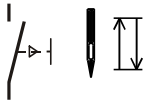
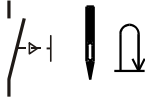
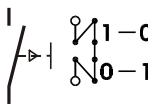
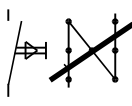
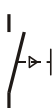
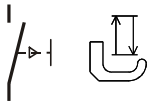
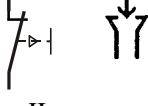
748	(NHOS/NPW/EST/RIV/RIUNT/NAPO) Input E3 is 1 = needle up without trimming 2 = needle position change-over 3 = single stitch 4 = single stitch with reduced length 5 = backtack inversion 6 = backtack suppression 7 = change-over position 8 = puller lift switched off	B,C	0001 - 0007 5	Kl. 1, 2, 3, 4
757	(TUM) Feed reverse speed of reaction (40, 50, 60 ms)	B,C	0000 - 0255 25 -	Kl. 2 Kl. 1, 3, 4
760	(FW/SPFW/STZ/STZA) - Stitch count for the remnant thread after the bobbin thread monitor responds with direct bobbin thread monitoring - Multiplicator for the fixed value (200) for determining the start value of the stitch counter with indirect bobbin thread monitoring	A,B,C	0000 - 0250 5	Kl. 1, 2, 3, 4
761	(FSL/FZ/VERZ) Prolongation Thread tension release/ Thread puller	B,C	0000 - 0080 0	Kl. 1, 2, 3, 4
762	Kein Kommentar vorhanden	B,C	0000 - 0255 196 -	Kl. 4 Kl. 1, 2, 3
763	Kein Kommentar vorhanden	B,C	0000 - 0255 1 -	Kl. 4 Kl. 1, 2, 3
770	(PF/VERZ) Lifting delay of presser foot at threadle-position „-1“	B,C	0010 - 0250 80	Kl. 1, 2, 3, 4
775	(ZRIE/STOPZ) Stop time (ms) with stitch in stitch backtack (decorative backtack)	B,C	0010 - 1000 100 0010 - 1000 150	Kl. 1, 3, 4 Kl. 2
789	(PEIPO) Needle position 10 (target stitch)	B,C	0000 - 0255 248	Kl. 1, 2, 3, 4
797	(HWT) Hardware test 1 yes 0 no	C	0	Kl. 1, 2, 3, 4
798	(EBC) Programming level C 1 yes 0 no	A,B,C	0000 - 0020 1	Kl. 1, 2, 3, 4
799	(MAKL) Machine class which has been selected	C	0001 - 0004 1 0001 - 0004 2 0001 - 0004 3 0001 - 0004 4	Kl. 1 * Kl. 2 Kl. 3 Kl. 4
800	(DRR) Direction of motor rotation viewed from belt pulley 1 left-hand rotation 0 right-hand rotation	C	0000 - 0001 0 0000 - 0001 1	Kl. 1 * Kl. 2, 3, 4
801	(RDR) Reverse rotation angle after seam end	B,C	0010 - 0212 32	Kl. 1, 2, 3, 4
880	(REG) Starting current max. [A]	C	0001 - 0010 5 0001 - 0010 8	Kl. 1, 2, 3 Kl. 4
884	(REG) Proportional amplification of the speed control (in general)	B,C	0003 - 0024 9 0003 - 0030 16 0003 - 0024 10 0003 - 0024 6	Kl. 1 Kl. 2 Kl. 3 Kl. 4
885	(REG) Integral amplification of the speed control	C	0010 - 0080 50 0010 - 0080 23	Kl. 1, 2, 3 Kl. 4
886	(REG) Proportional amplification of the order controllers	C	0001 - 0015 8	Kl. 1, 2, 3, 4
887	(REG) Differential amplification of the order controllers	C	0001 - 0015 8	Kl. 1, 2, 3, 4
889	(EINZ/REG) Time required for order controlling (0 = always)	C	0000 - 2500 200	Kl. 1, 2, 3, 4
890	(REG) Proportional amplification of the superior order controllers for the residual brake	C	0001 - 0025 15 0001 - 0025 22	Kl. 1, 2, 3 Kl. 4
897	(MOT) MINI motor version 1 long 0 short	C	0000 - 0001 0 0000 - 0001 1	Kl. 1, 3, 4 * Kl. 2

900	(REG) Additional P-Amplification of the speed control	B,C	0001 - 0024 10 0001 - 0030 16 0001 - 0024 6	Kl. 1 Kl. 2, 3 Kl. 4
901	(DRZ/SN) Trimming release speed	B,C	0030 - 0500 300	Kl. 1, 2, 3, 4
933	(ANZ) Display change-over 1 diagnosis 0 normal display	C	0	Kl. 1, 2, 3, 4
939	(VERZ/TUM) Rate time (premature change-over) for the transport changer	B,C	0010 - 0200 30	Kl. 1, 2, 3, 4

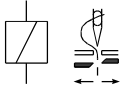
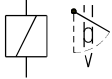
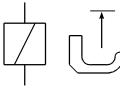
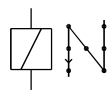
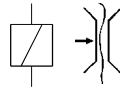
12. Electrical Connections Diagram X5 P40ED



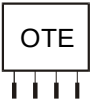
Bedeutung der Magnete bzw. Magnetventile, Taster / Meaning of magnets and/or solenoids and keys
 Signification des aimants resp. solenoides et touches / Significação dos ímãs e/ou as solenoidas e teclas
 Significato dei magneti, delle valvole magnetiche e dei tasti / Significación de los imanes y/o los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

S1 	Transportumstellung von Hand / manual feed reverse / renversement de marche manuel / mudança do transporte manual / commutazione trasporto a mano / inversión de transporte manual / handmatige transportomschakeling
S2  S3 S2 <446> = 1 S3 <748> = 1	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
S2  S3 S2 <446> = 2 S3 <748> = 2	Nadelpositionswechsel / needle position change-over / changement de position d'aiguille / troca de posição da agulha / cambio di posizione dell'ago / cambio de posición de aguja / naaldpositie-verwisseling
S2  S3 S2 <446> = 3 S3 <748> = 3	Einzelstich / single stitch / point unique / ponto individual / punto singolo / puntada individual / enkele steek
S2  S3 S2 <446> = 5 S3 <748> = 5	Nachfolgende Riegelfunktion invertieren / invert subsequent backtack function / inverser la prochaine fonction de bridage / inverter o próximo remate / invertire la funzione d'affr. successiva / invertir la próxima función de remate / inverteren op elkaar volgende hechtfunctie
S2  S3 S2 <446> = 6 S3 <748> = 6	Riegelunterdrückung / backtack suppression / suppression de bridage / supressão do remate / soppressione dell'afrancatura / supresion del remate / onderdrukking van het strookje
S2  S3 S2 <446> = 7 S3 <748> = 7	Umschaltposition / Change-over position / position le commutation / posição de mudança / posizione di commutazione / posición de cambio / omschakeling position
S4  <356> = I	Presserfuß / presser foot / pied presseur / calcador / alzapiedino / prensatelas / drukvoet
S4  <356> = II	Saugen / vacuuming / aspiration / aspirar / aspirare / aspirar / zuigen

Bedeutung der Magnete bzw. Magnetventile, Taster / Meaning of magnets and/or solenoids and keys
 Signification des aimants resp. solenoides et touches / Significação dos imãs 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

S6 	STOP/Anlaufsperr / STOP/Safety switch no run / STOP/Verrouillage de remise en marche / STOP/Bloqueio de arranque / STOP/Blocco avviamento / STOP/Bloqueo de repuesta en marcha / STOP/Startblokkering
Y1 I max 4 A * <356> = I 	Motorlauf / motor runs / moteur en marche / motor em movimento / motore in moto / motor en marcha / loop van de machine
Y1 I max 4 A * <356> = II 	Absaugung / vacuum / aspiration / aspirar / aspirazione / aspiración / zuigen
Y2 I max 4 A * 	Fadenschneiden / thread trimmer / coupe-fil / corte de linhas / rasafilo / cortahilos / draadsnijder
Y3 I max 4 A * 	Fadenwischer / thread wiper / écarteur de fil / retira-linhas / scartafilo / retirahilos / draadwiser
Y4 I max 8 A * 	Presserfuß heben / lifting presser foot / relevage du pied presseur / levantar do calcador / sollevamento del alzapiedino / elevación de prensatelas / drukvoet optillen
Y5 I max 8 A * 	Transportumsteller / feed reverse / renversement de marche / mudança do transporte / commutazione trasporto / inversión de transporte / transportomschakeling
Y6 I max 4 A * <776> = 1 	Kantenschneider / edge trimmer coupe de bord / corte cantos rasa bordi / corta bordes zoomsnijder
Y6 I max 4 A * <776> = 2 	Stapler / stacker / empileur / empilhadeira / impilatore / apiladora / hefapparaat
Y8 I max 4 A * 	Fadenspannungslösen / thread tension release / détenteur de fil / soltar tensão da linha / sbloccaggio tendifilo / detensión del hilo / verbreken van de draadspanning
A10 	Signal Unterfadenwächter / signal bobbin thread sensor
[A2]	Tastergehäuse an der Nähmaschine / key case at the sewing machine

Bedeutung der Magnete bzw. Magnetventile, Taster / Meaning of magnets and/or solenoids and keys
 Signification des aimants resp. solenoides et touches / Significação dos ímãs e/ou as solenoidas e teclas
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 y pulsadores / Betekenis van de magneten resp. magneetkleppen, toetsen

[A3] 	Oberteilerkennung / sewing machine identify unit
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- * 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 atuadores ligados ao mesmo tempo (ímãs, 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 (magnet, 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).

Appendix adaptor cable

Important Notice!

Your newly purchased **EcoDrive** control system is designed to be connected to a sewing machine/system via connector X5. This connector X5 is a 37 pole sub-d jack as shown in the wiring diagram.

*The connections/wiring of X5 **is not identical nor compatible** with the connections of the same type of jack X5 of the **Ministop control box**, nor with the same type of 37 pole sub-d jack of a **Servo control box**!*

In order to avoid damage to the control box, you may only connect the **EcoDrive** to machines wired according to VDMA Regulations

EN 60204-31

If you wish to replace a Ministop or Servotop control box with an EcoDrive, you must either use the appropriate adapter cable or rewire your machine!

We offer following adapter cables:

Replacement for Q40MS:	Q40ED with adapter	Art.-No. 55.591
Replacement for P40/51/52/47 MS	P40ED with adapter	Art.-No. 55.592
Replacement for PE40MS	PE40ED with adapter	Art.-No. 55.580
Y-Adapter for synchronizer (position control unit)		Art.-No. 55.570
Extension cable for synchronizer (position control unit) 1,5m		Art.-No. 55.506
Extension cable for speed control unit 1,5m		Art.-No. 55.507
Extension cable for operator panel EcoTop 5m		Art.-No. 55.573
Serial data cable for Q-Prog		Art.-No. 55.577

SECTION A

- (1) 510906 Upper face plate cover screw (long)
- (2) 5106309 Face plate cover complete with guard
- (3) 5106333 Face plate cover thread take-up lever guard
- (4) 5106354 Face plate cover screw spacer
- (7) 5131 Face plate cover lower screw (short)
- (21) 5227 Thread take-up lever guard attachment screws

SECTION B

- (6) 5106302 Rear arm cover
- (5) 5127 Arm cover screws

SECTION C

- (4) 51350435 Pressure bar - pressure regulating screw with extended knob for bridge.
- (11) 5106336 Pressure bar spring - long black
- (12) 5106394 Pressure bar spring locating pin.
- (13) 5276025 Pressure bar tracking ball
- (14) 5190 Slack thread regulator attachment screw
- (15) 5106342 Slack thread regulator
- (16) 5106325 Pressure bar position guide with screw (5158)
- (17) 5158 Pressure bar position guide screw
- (18) 5276028 Pressure bar lifting lever bracket. *(Optional only on manual quilters)*
- (22) 51350442 Pressure bar lifting finger. *(Optional only on manual quilters)*
- (24) 5276177 Pressure bar lifting finger. *(Optional only on manual quilters)*
- (25) 5276336 Pressure bar bushing
- (26) 5276241 Pressure bar with screw and ball
- (27) 5176 Pressure bar screw
- (28) 200039 Small pressure cup
- 200070 Large pressure cup. *(Option not shown)*

SECTION D

- (1) 5435 Thread take-up lever link hinge stud set screw
- (5) 5106357 Thread take-up lever link hinge stud (with oil wick)
- (6) 5106368A Thread take-up lever assembly complete

Individual parts:

Part # 5106368A

- (A) Hinge stud bronze bushing #5106368A-1
- (B) Side link #5106368A-2
- (C) Thread adjuster #5106368A-3
- (D) Take-up finger ball bearing #5106368A-4
- (E) Side link support pin #5106368A-5
- (F) Counter weight main stud #5106368A-6
- (G) Main link ball bearing #5106368A-7
- (H) Main link #5106368A-8
- (I) Needle bar stud screw #5106368A-9
- (J) Needle bar stud #5140706
- (L) Main stud needle bearing #5106368A-10
- (M) Needle bar stud needle bearing #5106368A-11
- (N) Take-up Finger #5106368-12
- (K) kit containing plastic thrust washers, oil plug, snap ring

- (7) 5106397 Upper oil felt
- (8) 5106325 Upper needle bar bushing (older quilters only) NO oil groove

(All XL quilters and newer manual quilters) Oil groove

- (9) 200030 Lower oil felt

- (10) 5106424-1 Lower needle bar bushing (all quilting machines) with retaining ring
- 5106424-2 Retaining ring can be used for both upper and lower bushings
- (11) 598923 Lower needle bar bushing wire thread guide
- (12) 200032 Needle bar with screw
- (13) 200032-1 Needle bar set screw
- (17) 200033-2 Needles
- (Please check with the factory for application recommendation)
- (18) 5106346 Thread eyelet and guide
- (19) 5106346-1 Thread eyelet attachment screw

SECTION E

- (1) 5140609 Thread take-up clamping screw (hex head)
- (2) 51036 Thread take-up flat alignment set screw (slotted)
- (3) 5106304 Main arm shaft from bearing
- 010002 Rear bearing (not shown)
- 260001 Adapter bushing for above bearing (not shown)
- 080001 Flexible coupling for main arm shaft with 260001 and 010002 installed
- (4) 5106303 Main counter-weight shaft with 5106303-1 and 5106304
- 5106303-1 Black counter-weight only

SECTION F

- (2) 51654 3-hole thread guide lock nut
- (3) 516577 3-hole thread guide
- (30) 5448 Tension assembly locking set screw
- (31) 5140610 Accessible plug
- (27) 5106374 Tension assembly Rotary disc style
- 5106374-1 Tension assembly squeeze discs style
- 5106374-2 Rotary disc for either tension assembly
- 5106374-3 Check spring for either tension assembly
- 5106374-5 Tension assembly - Air Operated for XL quilters with thread cutter

SECTION G

- (5) 5106306 Timing pulley upper shaft 5/8"
- (6) 5106303-3 Set screws for timing pulleys (upper or lower)
- (7) 5106305 Rubber timing belt
- (13) 5106307 Timing belt separator

Sewing Head Lower Assembly

- (1) 200033 Bobbin case L style
- (2) 200035-1 Bobbin case - large capacity M style
- (3) 200030-1 Screw for bobbin case holder finger
- (4) 200030 Bobbin case holder finger
- (5) 200043 Hook-plain chrome L style
- 200043-1 Hook-black tefton coated basket L style
- 200043-2 Hook-large capacity-M style
- (7) 5272229 Hook pump-complete
- (8) 5200346 Hook pump holding set screw
- (9) 200046 Bed slide
- (10) 200041 Ring gear - inside oil reservoir drives hook pump
- (12) 200043 Caster for oil reservoir
- (13) 5276246 Oil reservoir cover
- (14) 5200346 Set screw to hold ring gear drive shaft bushing in oil resov.
- (15) 5276244 Reservoir oil drain plug
- (16) 200040 Ring gear drive shaft
- (17) 010001 Ring gear drive shaft rear bearing
- (18) 5114063 Lower timing pulley set screws

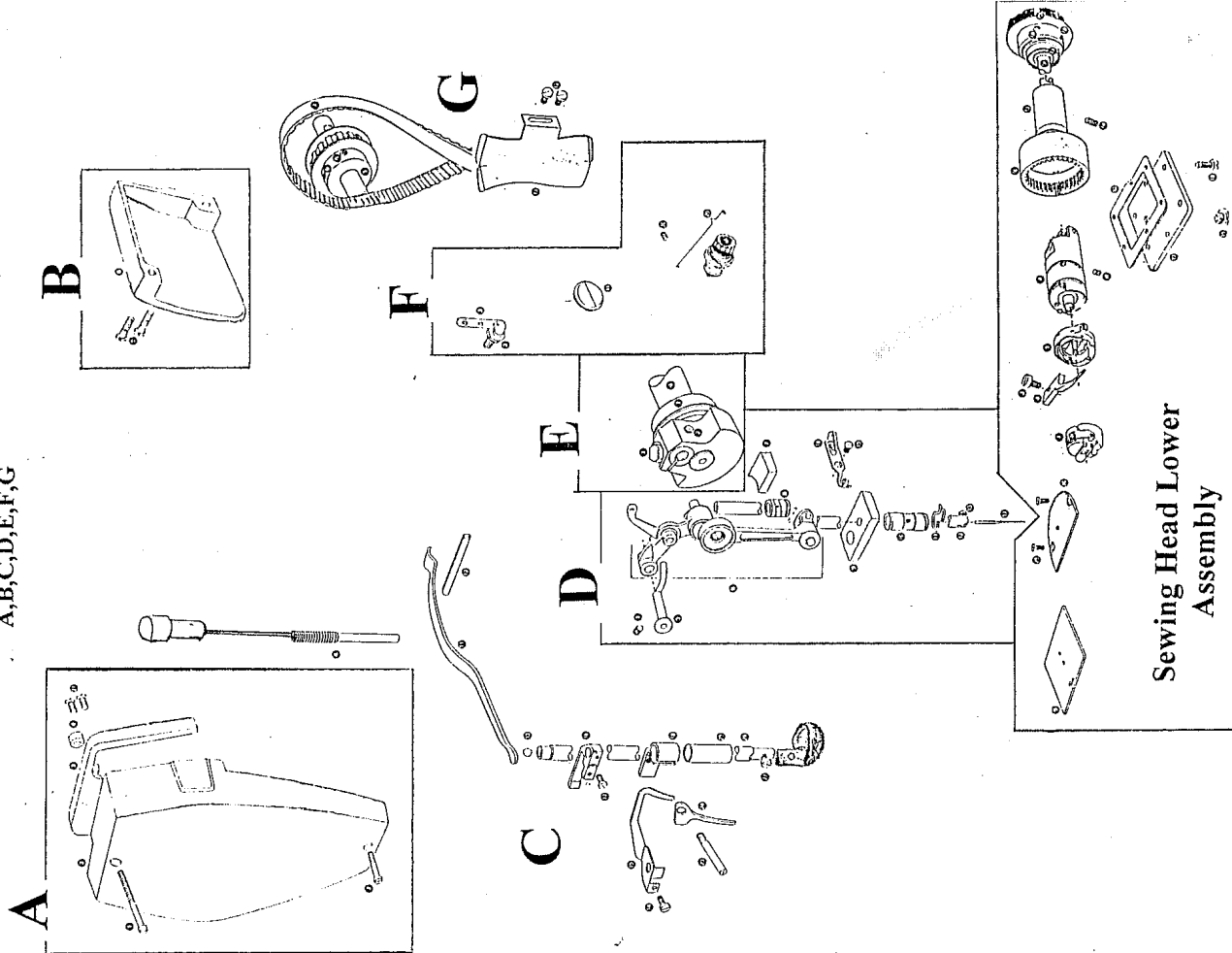


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THE STANDARD BY WHICH OTHERS ARE JUDGED

ABM INTERNATIONAL, INC.

Sewing Head Upper Assembly

A,B,C,D,E,F,G



Sewing Head Lower Assembly