

Operating manual

15141

Thread stop motion system for quilting machines

Doc. no. TH-0160-03

Operating manual, 15141

ELTEX THREAD STOP MOTION FOR QUILTING MACHINES

Function description

The thread stop motion system consists of Signal Givers, Central Control Unit and Light Switch.

The thread monitoring works with the principle that the thread will slide over the ceramic eyelet in the Signal Giver. A piezo crystal will transfer the thread movement into an electric signal which is amplified and evaluated by the electronics within the Signal Giver.

The thread monitoring is synchronised with the machine by means of a flag at one of the main shafts. The flag must be fitted so that it interrupts the infra-red light beam in the light switch once every stitch.

The central control unit coordinates the information from the light switch, the Signal Givers and the machine. If thread movement is missing, the machine will be stopped by the relay at the central control unit. The central control unit is powered by line voltage of 220, 290, 380, 440 or 550 V AC 50/60Hz, and includes power supply for connected Signal Givers.

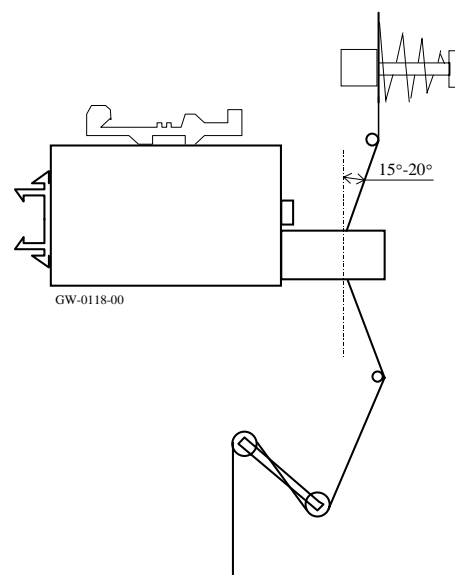
Signal Giver

The Signal Givers should be fitted on an DIN-rail between the thread brakes and the take-up lever.

The Signal Givers must be fitted so that the threads passes through the eyelets at an angle, (about 15–20° deflection), to detect the thread movement.

Each Signal Giver has it's individual ON/OFF switch which also contain an indication LED.

- **No light** = OFF
- **Continuous light** = ON
- **Blink** = Thread break detected



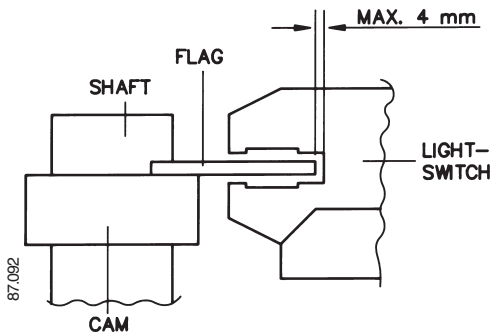
Light Switch

- Fit a 120° flag at one of the main shafts.
- The position of the flag can be checked with the red LED at the Light Switch or with the green LED at the right of the Central Control Unit.

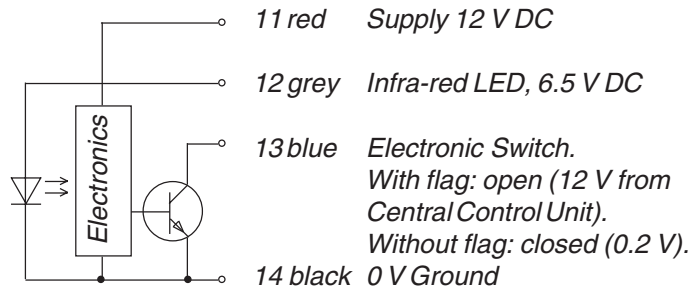
- Adjust the flag so that it enters the light switch just before the thread is tensioned. Also check that the tensioned yarn movement in the signal giver eyelet is covered by the time that the flag LED lights.

Normal position of the flag at a shuttle machine: The start of the flag should be just before the needles starts their way up and the end of the flag should be about when the needles have reached their top position.

Normal position of flag at a double chain machine: The centre of the flag should be when the needles are at their bottom position.



The Light Switch must be fitted so that the flag comes within 4 mm of the bottom of the Light Switch slot.



The voltages at the Light Switch connections are as shown.

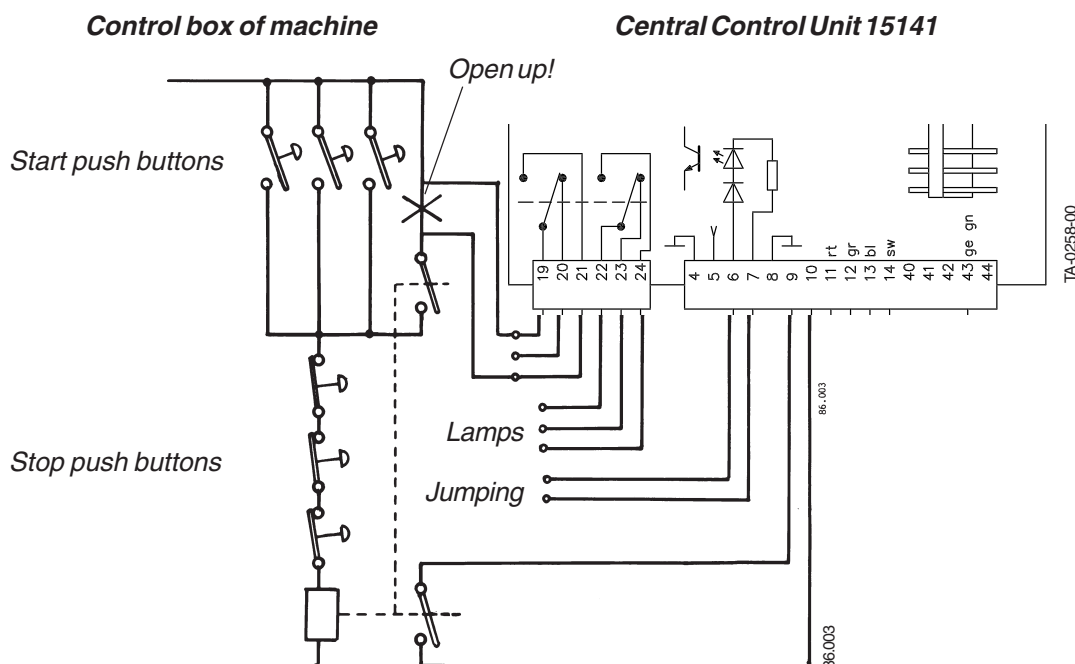
Instead of an Eltex Light Switch, a proximity switch can be used. Type: NPN, normally closed. Supply voltage 12 V DC. The voltage at the proximity switch output must be below 0.7 V when the switch is closed. If not, the sync LED will not indicate.

Central Control Unit

Fit the Central Control Unit near the control box of the machine and connect it according to the wiring diagram.

The relay for stopping the machine will be energised when a thread break is detected.

Connection example

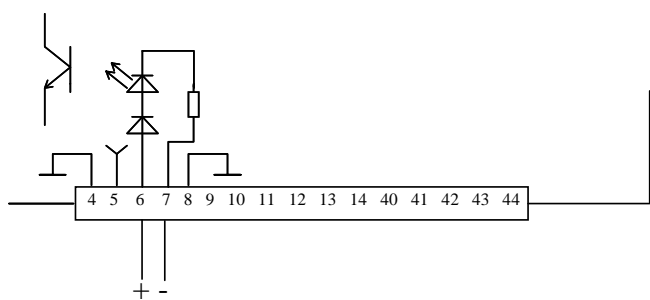


Running signal

Connect a contact to terminal 9 and 10 that is closed when machine is running and open when machine is stopped.

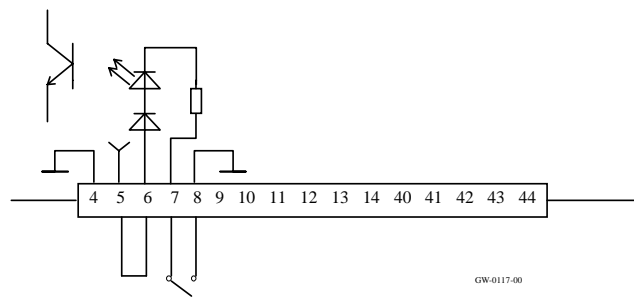
Jumping

If the machine is moving without sewing, i.e. the flag rotates through the Light Switch without sewing, the jumping input must be activated, otherwise the machine will be stopped. This jumping input is provided with an opto-coupler, which can be connected in two different ways.



Positive DC-signal
when jumping

If a DC voltage (10-24 V DC) is available during the time the machine is jumping, this voltage can be connected direct to terminal 6 and 7 with "+" to terminal 6.



Add jumper!
Contact closed
when jumping

If a contact is available that is closed during the jumping period, it can be connected to terminal 7 and 8. In that case a jumper should be connected from terminal 5 to terminal 6.

The Central Control Unit indication LED's

- The **red** LED (**STOP**) to the left is on when any Signal Giver has detected a thread break and the machine is stopped. The Indication will be resetted after next machine start and first flag.
- The **green** LED (**SENSE**) in the middle is on when the system is active, i.e. when the contact at #9 and #10 is closed and the jumping input is not activated.
- The **green** LED (**SYNC**) to the right is on when the flag is in the Light Switch. It flashes when the machine is running.

Sensitivity setting

The amplification of the signal from the thread movement can be adjusted with the gain potentiometer at the top right corner of the Central Control Unit.

Thin threads, thin material or low thread tension = High setting

Thick threads, thick material or high thread tension = Low setting

To adjust, turn the potentiometer clockwise to end position (maximum amplification). Start the machine and turn the potentiometer slowly anti-clockwise until the machine stops although no thread is broken (false stop). Increase the potentiometer setting one division (clockwise). If false stop still occurs, increase the setting by another half division.

Stop margin

In some cases the thread can "jump around" in the eyelet of the Signal Giver. During this event no stitch can be detected, to override this the stop margin is effective. A four position DIP switch is used to set the stop margin. Seven different settings are possible. The machine will be stopped after the set number of missing stitches. The connection diagram shows the different settings as well as the location of the DIP switch.

System ON/OFF

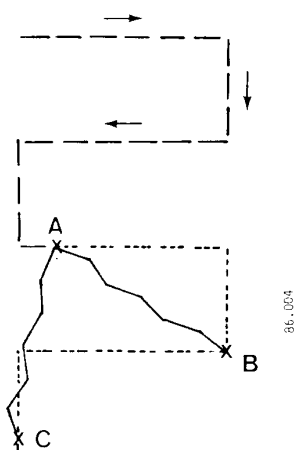
There is also an ON-OFF switch located next to the DIP switch. This can be used if you want to run the machine without thread, for instance at start-up or quilt machine trouble shooting.

Ribbon Cable from Central Control Unit to Signal Givers

The Signal Givers are connected to the central control unit in parallel. Keep the cable from the central control unit to the bus cable (from Signal Giver to Signal Giver) as short as possible. If the bus cable is delivered after May -96 (normally black cable) the junction point between the bus cable and the cable from the Central Control Unit must be located at the middle of the machine, then there will be about the same number of Signal Givers at both left and right branch.

Bottom thread detection

When the machine is sewing sideways according to the picture, it can be possible to detect if the bottom thread is broken or missing. If the bottom thread runs out at point A, no top thread will be pulled out from point B to C.



TROUBLE SHOOTING

Before replacing any parts, check the following:

Signal Givers with moving threads are switched ON and have continuous red indication, not used Signal Givers are switched OFF and have no indication.

The thread stop motion does not stop the machine at thread breakage

None of the LED's at Central Control Unit are on when machine is running, switched ON Signal Givers do not indicate:

1. Check the fuse and power supply.

The centre green LED does not light when machine is running:

1. Check the running mode signal when machine is running. Voltage at terminal 9 should be low. If voltage is high, the running mode contact of the machine might be broken. Check also that terminal 43 is connected to protective earth.
2. Check the connection at jumping input terminal 6 & 7.

The green LED at the right of the central control unit does not flash when the machine is sewing:

1. Check the flag and the Light Switch.
2. Check the voltages at the Light Switch connection.

All LED's at Central Control Unit function normally:

1. Check that ON-OFF switch at Central Control Unit is switched ON.
2. Check the connection of the flat cable to the Signal Giver.
3. Check and adjust the setting of the Gain potentiometer (decrease), and the stop margin (decrease).

The machine stops immediately although the thread is OK

All LED's function normally:

1. Check if any Signal Giver is switched ON, but has no thread moving.
2. Switch all Signal Givers OFF. If the machine stops immediately one Signal Giver is broken, if the machine does not stop, continue with 3. To find a broken Signal Giver, disconnect a couple of Signal Givers until the machine does not stop.
3. Check and adjust the position of the flag.
4. Check and adjust the setting of the Gain potentiometer (increase), and the stop margin (increase).
5. Check the connection of the flat cable to the Signal Giver.

All LED's (or some of them) on activated Signal Givers flash at random when bus cable is touched:

1. Check the connection of the bus cable (ribbon cable) to the Signal Giver. The bus cable might be broken.

The thread stop motion stops the machine occasionally although the thread is OK

1. Check and adjust the setting of the flag.
2. Check and adjust the setting of the gain potentiometer (increase).
3. Check the connection of the ribbon cable to the Signal Givers.
4. Increase stop margin setting.
5. In some cases "false stops" can occur. The false stops can be caused by thread jumping or similar problems. Please check machine adjustment, top and bottom thread, needles and material. Increase gain setting and/or stop margin.

Function of signal giver 15427 with central control unit 15141

The Eltex 15427 Signal Givers are intended to be used for multi-needle quilting machines and are used together with the 15141 Central Control Unit and some equipment for synchronising the system with the machine. By setting of DIP switches, the stop margin, i.e. the number of stitches allowed to be missing before stopping the machine, can be set from 1 to 7 stitches.

- Each Signal Giver has its own stop margin counter.
- Stop output is common for all Signal Givers, going high at stop.
- Gain is set at the Central Control Unit by a DC Voltage of 0–6.5 V. High setting for thin threads, thin material or low thread tension. Low setting for thick threads, thick material or high thread tension.
- Each Signal Giver has an ON-OFF switch and an Indicator LED built into the switch. This LED will be OFF when the Signal Giver is switched OFF and steady ON when Signal Giver is switched ON. A detected thread break is signalled by flashing the LED ON and OFF.

At start of machine (closure of terminals 9 and 10 at Central Control Unit) a preset signal is sent to all Signal Givers setting the stop margin to 7 stitches. This is a positive pulse (12 V DC), at pin no 7 in ribbon cable. First flag after start of machine sets the sense indication at Central Control Unit.

The starting edge of flag (positive going signal to +12 V) sets Signal Givers to start the sensing period.

- If thread movement is detected the counter is set to the selected stop margin.
- If no thread movement is detected before the end of the flag (negative going to ground) the stop margin counter will be counted down one step.

This is repeated for every stitch.

If a thread movement is detected before the counter reaches minimum, the counter is preset to the selected stop margin. If no thread movement is detected for the set stop margin of stitches, the stop output from the Signal Giver goes high, pin no 9 in ribbon cable.

The stop signal is setting the stop flip-flop in the Central Control Unit. The stop flip-flop energises the relay, turns on the stop indication at the Central Control Unit and cancels any further flag outputs. It also starts the flash oscillator so that the detected

thread breakage will be indicated. The flash is activated by opening and closing the stop line to ground.

When the machine is started again, the closure of running mode contact will reset stop indication at the Signal Giver. First flag will reset stop indication and set sense indication at the Central Control Unit

A "JUMP" input is also provided, to make it possible for the machine to move from one place to another without sewing. JUMP will de-activate the sense flip-flop so that no flag pulses are sent out and sense indication will be OFF. When the JUMP is finished a preset signal is sent to the Signal Givers setting the stop margin to 7 stitches and flag pulses are again sent out to the Signal Givers. First flag after JUMP will turn on the sense indication at the Central Control Unit.

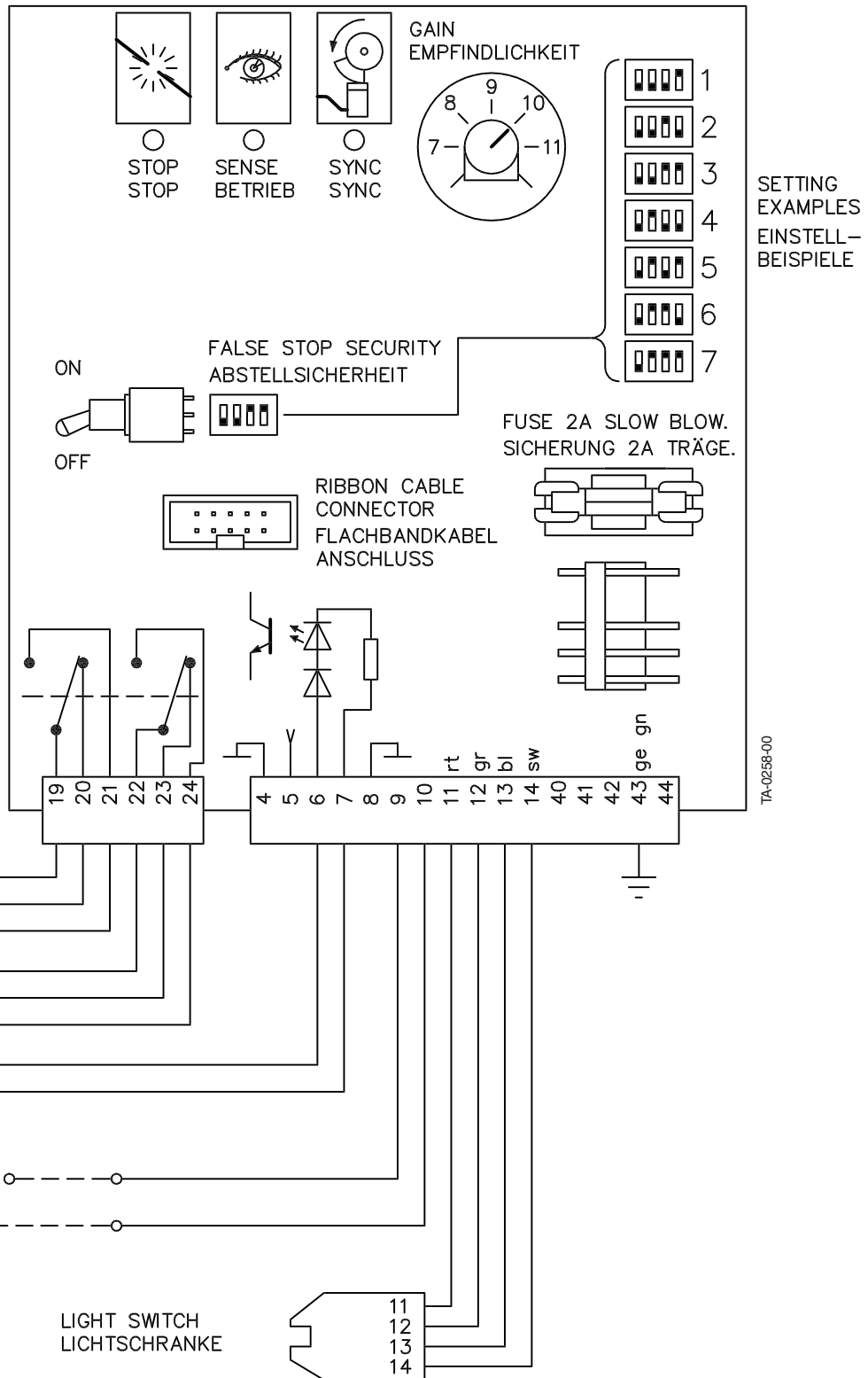
The Power Supply for the Signal Givers is 24 V DC, unregulated, while the logic signals are +12 V DC regulated. The Gain Voltage should be adjustable from 0 to +6.5 V DC.

The Central Control Unit is powered by line voltage of 220, 290, 380, 440 or 550 V AC 50/60Hz.

The items described in this manual and the manual itself may be subject to change without notice.

Connection diagram

rt: red, rot
 bl: blue, blau
 gr: grey, grau
 sw: black, schwarz
 ge gn: yellow green, gelb grün



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for temperature, air humidity, voltage and current.

*(This manual is also available in German,
Diese Betriebsanleitung ist auch auf Deutsch erhältlich,
Dokument-ID: TH-0235)*

We reserve the right to modify the design.



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