Weft stop motion
28300/28301

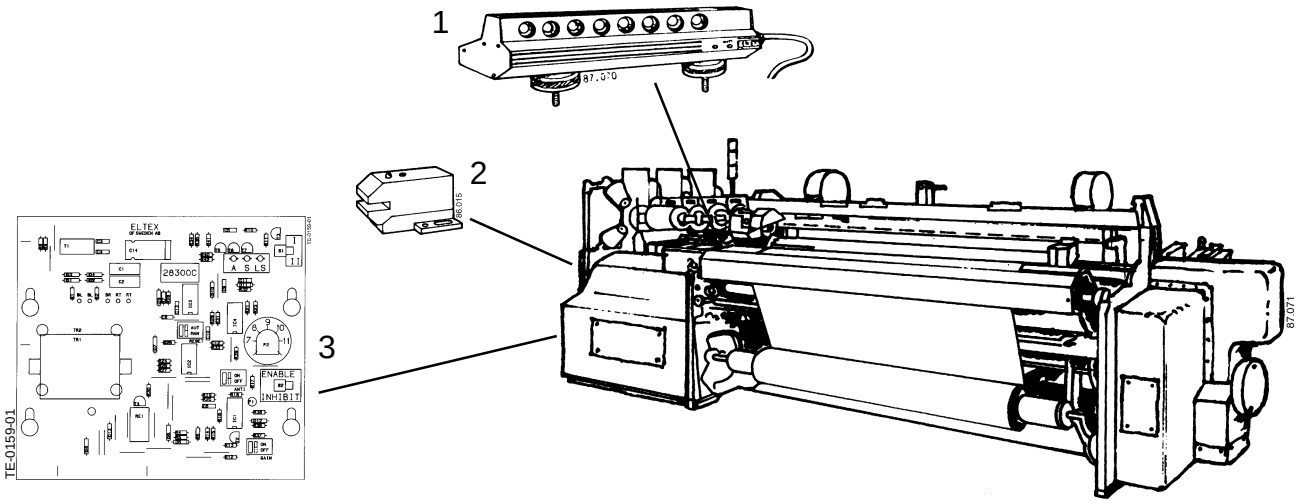
General central control unit with logic current input

OPERATING MANUAL

ELTEX OF SWEDEN

Doc. no.: TH-0066-01

Weft stop motion with central control unit 28300/28301



Function description

The ELTEX weft stop motion consists of three parts:

1. **Signal giver for weft detection.**
2. **Light switch for synchronising with the weaving machine.**
3. **Electronic board (central control unit).**

The movement of the weft yarn is detected by the signal giver. The signal giver transforms the yarn movement into an electric signal, which is amplified and evaluated within the signal giver, the output is given as a logic signal.

Signal will be indicated by green LEDs on the signal giver and on the electronic board.

The supervision of the weft yarn will take place when a flag is interrupting the infrared light beam in the light switch. To discover all weft breakages it is important to detect the yarn movement at the very end of the yarn insertion

If extra weft yarns inserted by mistake are to be detected (ANTI-function) it is advisable to have an extra sensing period (extra flag) during the first half of the weft insertion before the transfer point.

The supervision time will be visible through a red LED on the light switch and through a green LED on the electronic board.

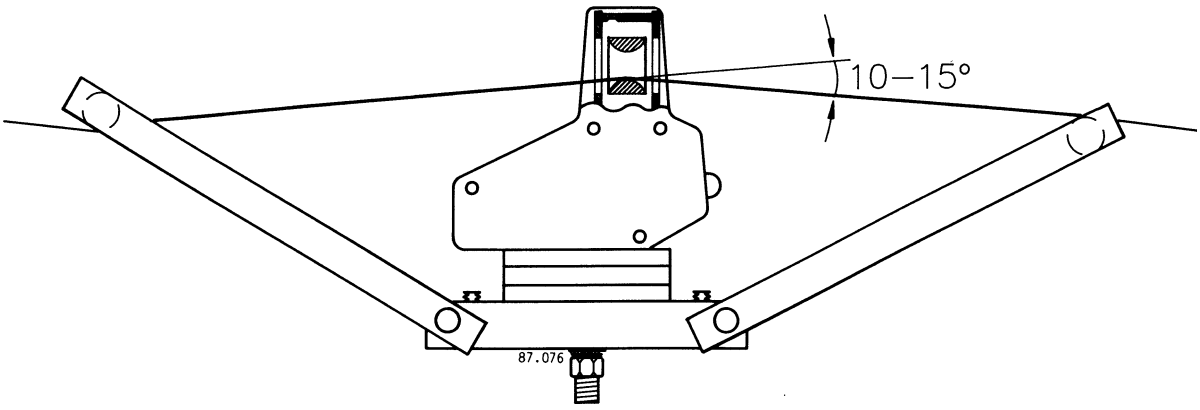
The electronic board will compare the signals from the signal giver and the light switch. If the yarn movement is wrong, a stop signal will be given to the weaving machine. The electronic board or the signal giver will also have a potentiometer for setting the signal amplification. This will make it possible to detect all yarn qualities.

Logic Current principle

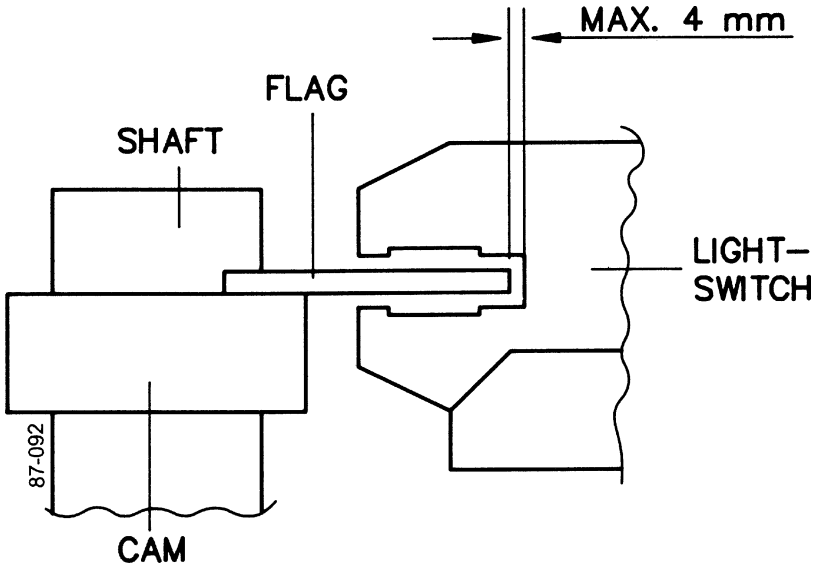
Eltex logic current signal givers are communicating with the central control unit with a DC current signal. When one yarn is moving, the signal giver is sending a certain amount of current, and this is called a "current unit". With the switch on the board it can be set to detect one or two current units from signal giver.

Fitting

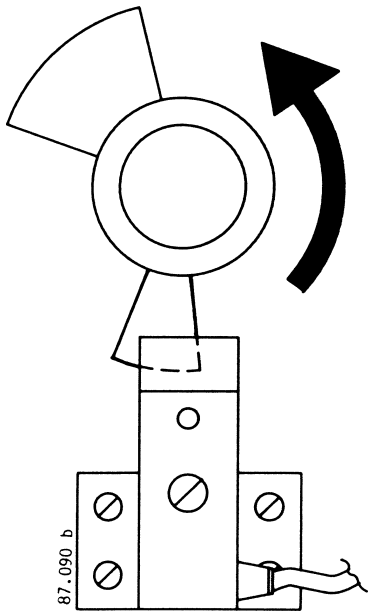
1. The central control unit can be fitted in the Eltex metal box or directly in the control box of the weaving machine. For size of central control unit see page 11.
2. The signal giver must be fitted on a bracket between the colour selector and the yarn brakes, so that the thread is touching the ceramic eyelet continuously. The movement will be picked up most efficiently, if the thread deviates about 10–15° when it passes the signal giver eyelet. The Eltex yarn guide can be used to ensure this.



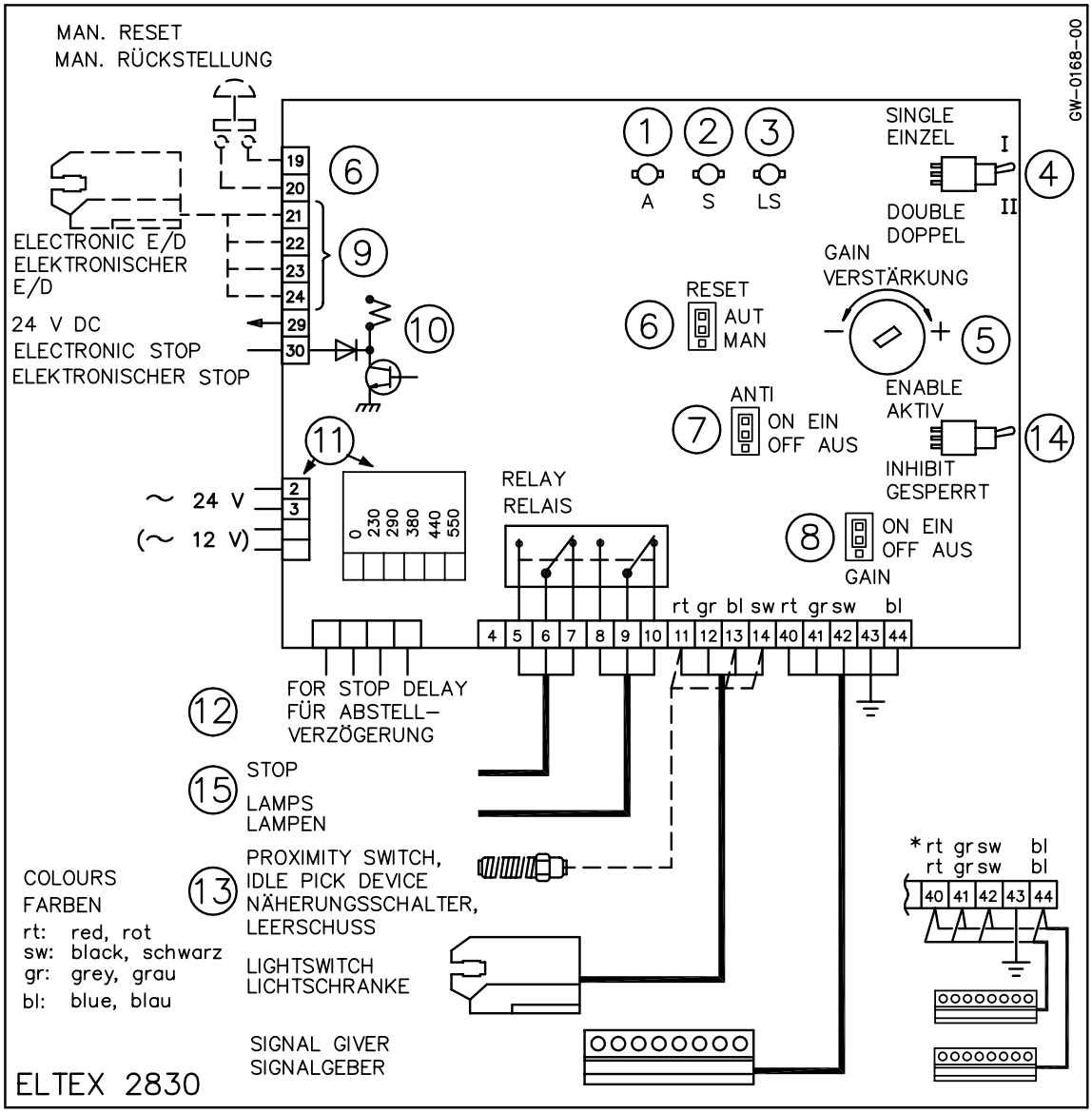
3. A flag is fitted on the main shaft. The light switch should be fitted so that the flag passes through the slot once every pick. The distance between the bottom of the slot of the light switch and the flag must not exeed 4 mm. The flag width must be about 30–45° by 360 picks/min and 45–60° by 500 picks/min. The flag must pass through the slot during the last part of weft insertion.



If the ANTI-function is used it is advisable to fit an extra flag which passes through the light switch before the transfer point. The extra flag will make it possible to detect an extra faulty yarn also if it is dropped by the transfer.



Connections, setting of switches and LED functions



The relay is energised when the machine is running and drops when there is a weft fault.

** If two signal givers are used they will be connected in parallel.*

1 Red LED – ANTI function

If too many weft yarns have been moving at the same time during the sensing period, the central control unit will receive too many current units, and the machine will be stopped. This LED will then light up. It turns off when the machine is restarted.

2 Green LED S = Signal giver

If the central control unit receives correct amount of current units this diode will light up.

3 Green LED LS = Light switch

This LED will light up during the sensing periods, i. e. when the flag is interrupting the infrared light beam in the light switch.

4 Single – Double switch

Position I: the correct signal is one current unit. If the central control unit receives more current from the signal giver, it will stop and indicate "ANTI-fault".

Position II: the correct signal is two current units. If the unit receives less current it will stop the machine. If the unit receives more than two current units it will stop the machine and indicate "ANTI-fault".

5 GAIN potentiometer

For adjustment of the sensitivity in the signal giver. The sensitivity setting is done via a 0–6.5 VDC voltage from the central control unit to the signal giver.

6 Reset switch

The reset after a stop can be done in two ways automatically and manually: For automatic reset set the connection shunt in "AUT" position. The relay will be reset after one second.

For manual reset set the connection shunt in "MAN" position. A closing contact, normally operated by the start push button on the weaving machine, must be connected to no 19 and 20.

NOTE! When weaving machine is running this contact must be open. When the Eltex relay is used for the indicating lamp, use the manual reset function.

7 ANTI switch

The ANTI-function can be switched off. This is necessary when using the E2010-2 signal giver. Due to the function on this signal giver the output can be both one and two current units when single picks are woven. To switch off, move the connection shunt to "OFF" position.

8 GAIN switch

When there is a GAIN potentiometer on the signal giver, the GAIN potentiometer on the board can not be used. The connection shunt must be set in the "OFF" position.

9 Electronic single–double switch

Connection 21–24 (Special applications only).

When single and double picks are mixed and the same yarn is used both for single and double picks it is possible to control the single-double sensing by a light switch or a proximity switch. If a light switch is used the flag must be out of the slot during the sensing time of the single picks and in the slot during the sensing time of the double picks. The Single-double must be in position II in this case. If different yarns can be used in the single and double picks it is possible to detect mixed weaving using a E2010-2 or a E2070 signal giver instead.

10 Electronic stop

Connection 29–30

When it is necessary to avoid the relay fall time the electronic stop output can be used. No 29 is connected to +24 VDC and no 30 is active low when machine is running. Maximum current on this connection is 50 mA.

11 Power supply

The central control unit is available in two different versions:

28300 with a transformer for 230–550 VAC
Current consumption:
max 75 mA/230 VAC

28301 with a transformer for 12 or 24 VAC
Current consumption:
max 1 A/12 VAC

12 Connection for stop delay circuit

If it is desired to delay the stop in order to stop the machine in a certain position, the delay circuit 75905 can be connected here.

Note: Do not use the extra flag, if 75905 is fitted.

13 Idle pick

A proximity switch with NPN output can be used. During empty picks it must close between 13 and 14 (ground).

14 Weft stop inhibit

"**Enable**" means that the weft stop motion is active. "**Inhibit**" means that the weft stop motion is not active, and the machine can run without weft.

15 Stop relay

Max. resistive contact load:

120 VA / 48 V AC

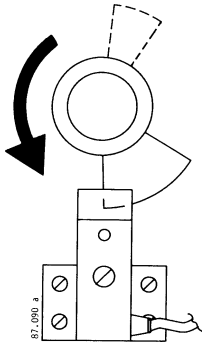
60 W / 48 V DC

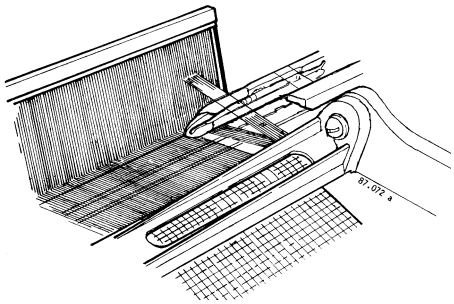
Adjustment

1. Light switch (LS)

Adjustment of the flag is important in order to achieve a good weft detection. The flag must be adjusted so that it leaves the light switch at the moment when the weft insertion is complete and the gripper releases the weft. The red LED at the LS will help when doing this adjustment.

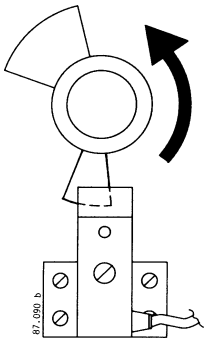
The flag shall be adjusted so that the red LED goes out just before the weft is released by the gripper.

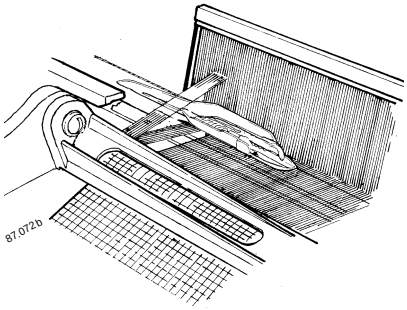




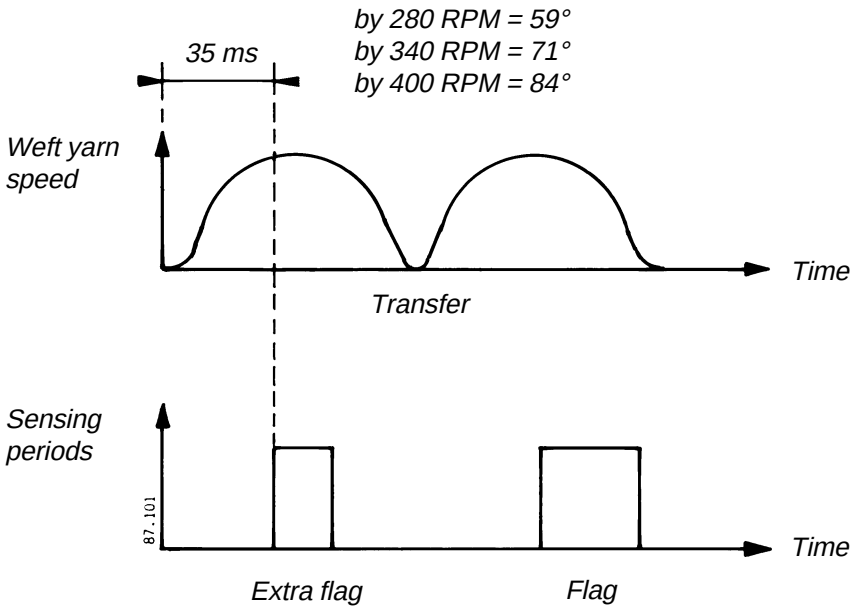
The flag setting shall be checked every time the cloth width is changed.

If an extra flag is used for the ANTI-function, it must be adjusted to enter the light switch during the first half of the weft insertion.
The extra flag should not enter the light switch earlier than 35 ms after the weft insertion has started.





The sensing periods in comparison to weft yarn speed during insertion.

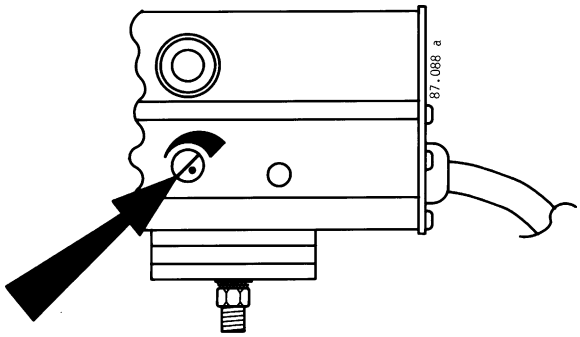


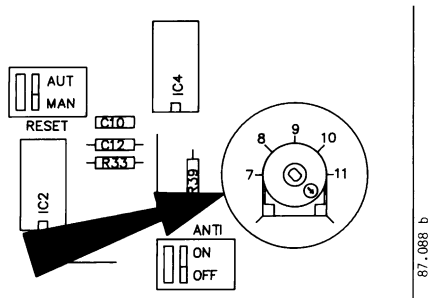
2. Signal amplification

The signal amplification "GAIN" can be adjusted. If the signal giver has a potentiometer the GAIN must be set on that one, otherwise the potentiometer on the board will be used. Turn the potentiometer clockwise to end position (maximum sensitivity). Let the machine run and turn the potentiometer slowly counter-clockwise until the weft stop motion stops the machine with the weft yarn present. Then turn the potentiometer approx. 45° clockwise. If there are still false stops, increase the setting by another 20°.

The amplification should be adjusted after every change of yarn quality. To get optimum supervision security it is necessary that the light switch and the signal giver are correctly adjusted in advance.

Please note that fully counter-clockwise position does not mean zero amplification. Therefore it is possible that some yarn qualities will run with minimum sensitivity.





Replacement of an analogue type weft stop motion

A weft stop motion of analogue type can be updated with a weft stop motion with logic current. The replacement is easy, and all the advantages connected with the logic current system will be attained. Only the signal giver and the printed circuit board must be replaced.

The 28300 board with 220–550 V AC main supply will replace all versions of 2510, 2511 and 2610 board. The exception is the 2510 DI unit which has two extra relays for indication of lower or upper weft used on, for example, a velvet machine.

The 28301 board with 12 or 24 V AC power supply will replace all versions of 2524, 2525 and 2624 boards.

If the light switch and the signal giver are connected via connectors in a flange, no wires in the 16-pole edge connector need to be rewired. In that case, order the new signal giver with 5 pole 180° DIN connector and plug in the same socket as the old signal giver.

If you are replacing a 2507 or 2607 unit and a chassis you must also order the 16-pole edge connector. The part number is 62615.

Generally the replacing procedure will be as follows:

1. Switch off the power.
2. Disconnect the wires for the main supply.
3. Pull off the edge connector(s) and dismount the board.
4. Put the new label with numbers 4–14 and 40–44 on the 16-pole edge connector. On request extra labels will be sent free of charge. The part number is: 6143
5. Disconnect and replace the old signal giver with the new E-type one. Connect it according to wiring diagram on page 4.
6. None of the other wires on the 16-pole edge connector or on the other connectors needs to be rewired.
7. Mount the new board, push on the edge connectors and connect the main supply.
8. Set the switches as described in the points 4–8 on page 4 and 5
9. Start the machine and adjust the GAIN potentiometer as described on page 7.

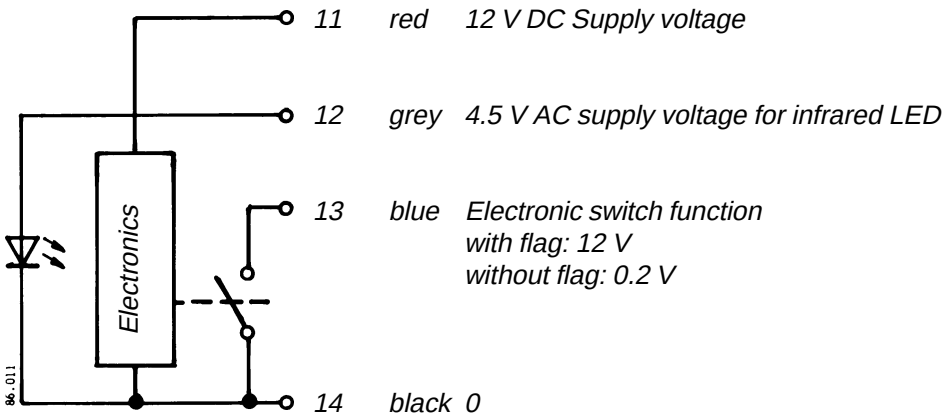
Trouble shooting

Before replacing any part check the following points:

The WSM stops at every pick

1. None of the LED's are on:
   a) Check the main supply.
   b) If the main supply is OK disconnect the edge connectors, if the green "LS" does not flash replace the central unit.
2. "LS" LED is on all the time:
   a) Check the light switch connection.
   b) Check the voltages see drawing below, or replace the light switch.
3. If the WSM stops with the red LED "A" on every pick:
   a) Check if the single-double switch is in correct position.
   b) If a E2070 signal giver is used check the position of the switches on the signal giver. See description of the signal giver.
   c) Check the GAIN potentiometer, if it is set to MAX position turn it anti clock-wise.
   d) If a E2010-2 signal giver is used the ANTI-function switch must be set in "OFF" position. The "1+2" eyelets are sending two current units and if single-double switch is set to single picks the WSM will stop.
4. The "S" green LED does not flash when a yarn is pulled through the signal giver eyelet:
   a) Check if the signal giver is correctly connected
   b) Check if the single-double switch is in the correct position
   c) If an E2070 signal giver is used check if the switches are in correct position.
   d) Check the GAIN potentiometer, if it is set to MIN position turn it clock-wise.
5. If all LED's are indicating correctly:
   a) If the WSM is not reset by the machine check that the reset switch is in "AUT" position
   b) Check the adjustement of the flag (or flags).

The voltages on the Light Switch connections



The WSM sometimes gives a stop impulse without reason

1 The "A" LED does not indicate:

   a) Check the adjustment of the flag (or flags). If the yarn is released a little earlier sometimes and the flag is passing the light switch late, false stops can occur.

   b) The weft yarn is not continuously touching the ceramic eyelet. Try to guide the yarn with a yarn guide.

   c) The GAIN is set too low, try to set the potentiometer in a higher postion.

   d) If the E2070 signal giver is used and the WSM is stopping each time a certain yarn is inserted, one of the switches might be in wrong position.

   e) Too much dust and dirt in the light switch slot.

2 The "A" LED indicate an ANTI-fault:

   a) Another yarn than the inserted one is moving during the sensing period. For example the movement of the colour selector when it is presenting the next yarn causes this kind of stop. Try to adjust the timing of the colour selector.

   b) The GAIN potentiometer is set too high, readjust the potentiometer.

   c) If an E2010-2 signal giver is used the ANTI-function switch must be set in the "OFF" position.

The WSM is not stopped by yarn breakage

1 "LS" LED is off all the time even when the flag enters the light switch.

   a) The flag does not pass deep enough in the light switch slot.

   b) Check the voltages on the light switch connection see drawing or replace the light switch.

2 The "S" LED is on all the time or flashes now and then although no yarn is moving in any of the eyelets.

   a) The signal giver is not connected to earth, check connection on no 42.

   b) The signal giver is defective, replace it.

   c) The electronic board is defective, replace it.

   d) Any other equipment is transmitting a strong interference try to find and eliminate.

3 The LEDs are indicating correctly.

   a) The GAIN potentiometer is set too high.

   b) Manual reset is used, the contact connected to 19 and 20 is closed continuously when the machine is weaving.

   c) If the WSM relay is switching, but the machine is not stopping. The connection on the relay is improperly made or the fault is to be found in the control box of the weaving machine.

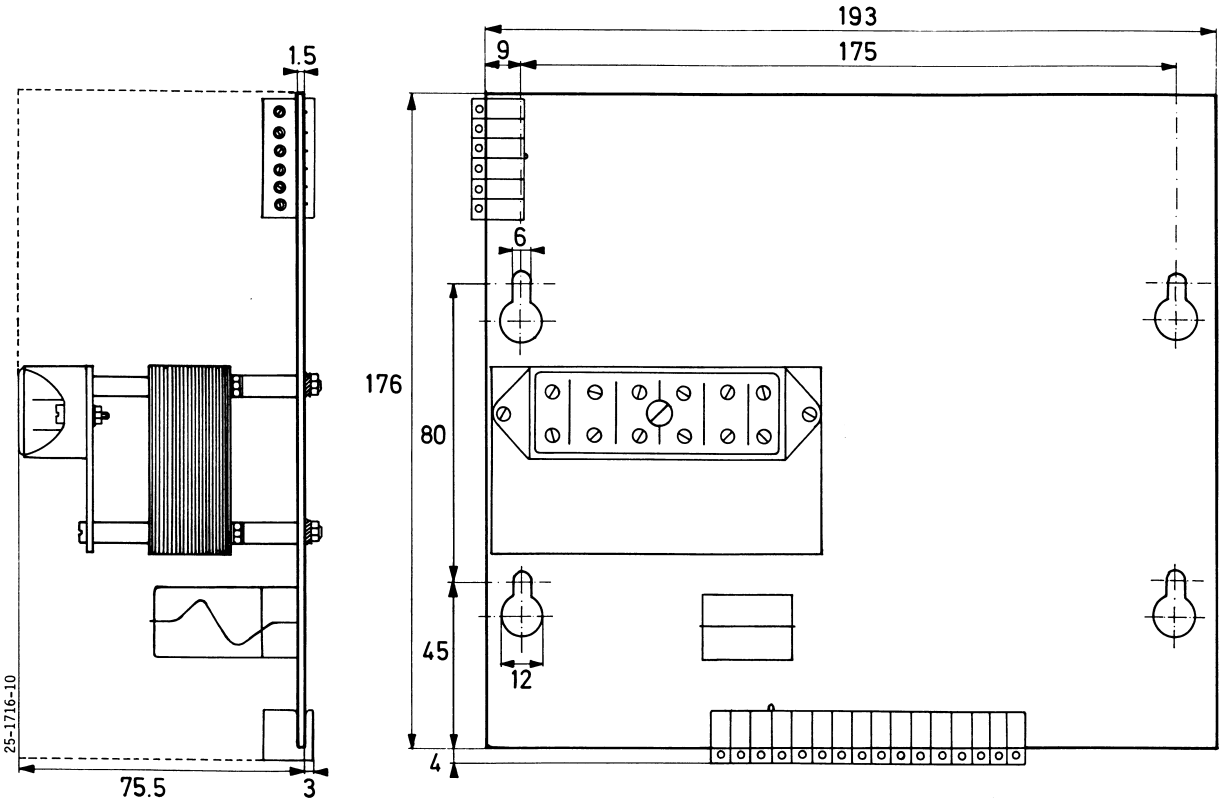
The WSM sometimes does not stop if there are weft faults

   a) The flag is not correctly adjusted.

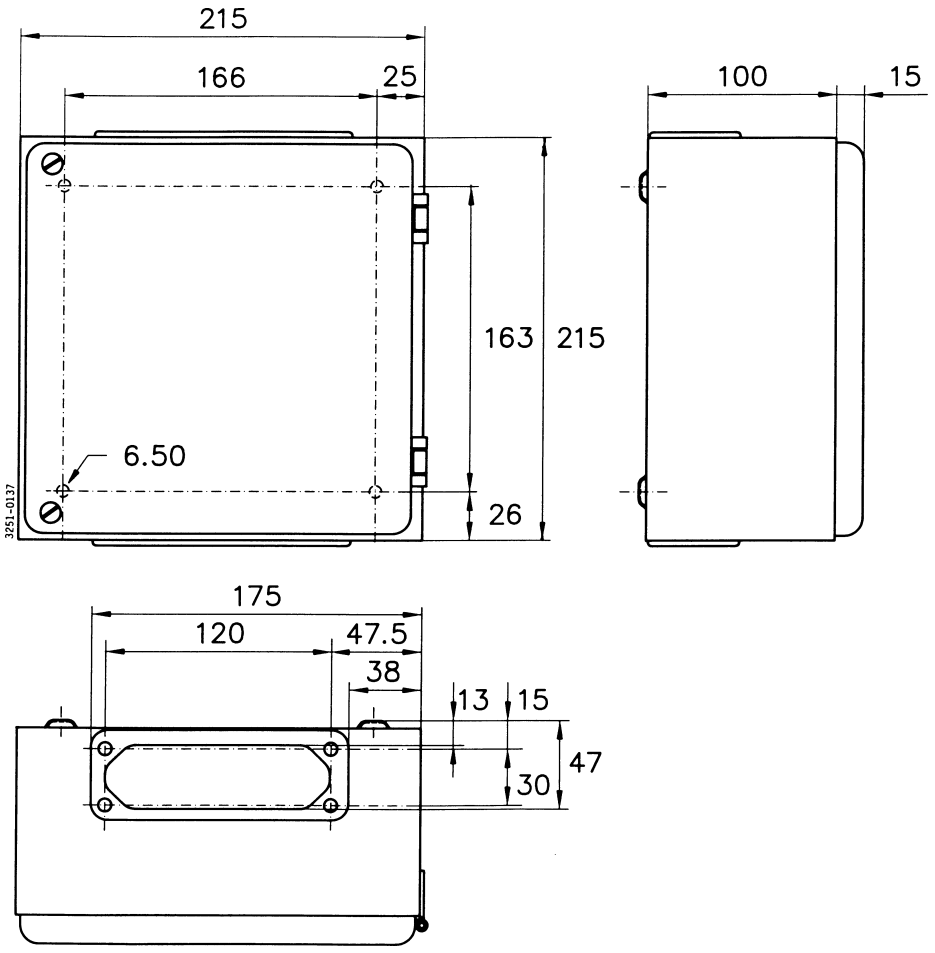
   b) The GAIN potentiometer is set too high.

   c) Another yarn than the inserted one is moving during the sensing period.

Size of the electronic board (central control unit)



Size of metal box for central control unit



Eltex of Sweden AB

is an innovative company manufacturing and marketing high-technology electronic equipment.
The company was founded in 1964 and has affiliated companies in many countries.
Today, Eltex employ people worldwide.

Eltex of Sweden AB is the market leader in the world of electronic yarn movement detectors for textile machines. We have a large range of control equipment and load limiters for electrical heating systems, and also power selectors for central heating systems (oil-gas-electric).
Eltex also manufacture data acquisition systems for online operation and small data loggers for temperature, air humidity, voltage and current.

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