Kellfri®

21-ELPV8

ELECTRIC STEERING VALVE

8 SECTIONS

CAREFULLY READ THE OPERATING INSTRUCTIONS BEFORE USING THE PRODUCT!

OPERATING INSTRUCTIONS TRANSLATED FROM THE ORIGINAL

INTRODUCTION

Thank you for choosing a product from Kellfri AB. By following the general safety information and the instruction manual and by using common sense, you will have a great and safety use of your Kellfri product for many years. Kellfri designs and delivers effective, affordable machinery and components for forest, agriculture, construction and gardening in Sweden, other Nordic countries and Europe.

PRODUCTINFORMATION

Eliminate heavy lifting with a crane valve between the tractor and the lumber trailer. The (joystick weighing only 0,8kg) is connected to the trailer with the power cable. The lever has integrated electronics for electric control valves. Easy to program using the levers two buttons, you can adjust for example initial and maximum speed of the lever's all movements. There is no need of a computer for programming.

TECHNICAL DATA

Weight	720 g
Height	185 mm
Flage diameter	120 mm
Center diameter of mounting holes	108 mm
Lever	PMW 100 Hz
Channels	8 st (6 st analoug 2 st digital)
Handel	Molded plastic with fiberglass reinforcement
Bellow	Rubber
Byggnaden	stainless steel and aluminium

CONNECTING THE JOYSTICK TO THE POWER SOURCE

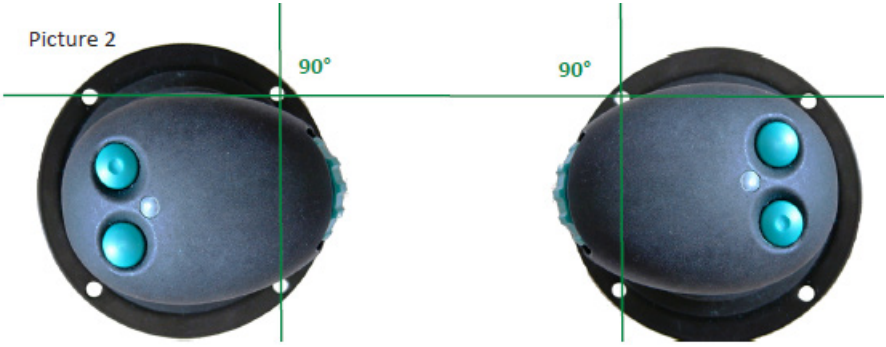
The ERGO-DigiStick joystick is connected to the power source with the power cable. The red wire is positive (+) and the black wire is negative (-). The power should be taken directly from the battery and the power cable should be equipped with a 10A fuse and power switch. To protect the electronics in the joystick from high voltage spikes caused by the starter, it is important that the power is switched off from the joystick when the working machine is started! The powerswitch is also needed for adjustment of the minimum and maximum current.

HOW TO PLACE THE JOYSTICK

- The joystics are intalled so that the rolls are facing each other. You use your thumbs to steer the rolls.
- The best working position is obtained if the joysticks are installed at both sides of the driver's thighs. The joysticks should lean forward 10 to 15 degrees (see picture 1). When the joysticks are installed like this, the movement for the wrist is natural also when the joystick is pulled back.
- The joystick should be installed at a height so that the forearm is horizontal when the hand rests at the joystick. The fastening holes should be in line with the operators seat (see picture 2). Correctly installed the movements of the joystick are forward/backward and right /left.

Picture 1

Picture 2

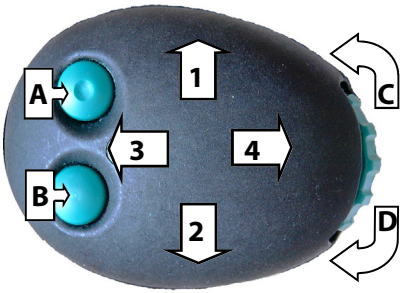


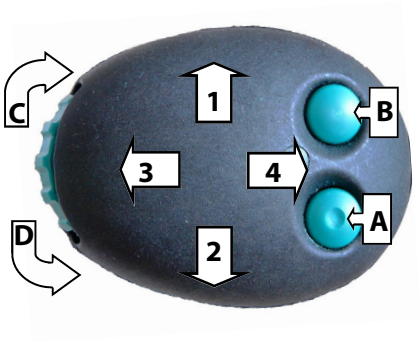
DIRECTIONS OF MOVEMENT AND LABELING OF CONTROL CABLES

In the image below, the lever movement directions marked with 1, 2, 3, 4. The roller movement directions are marked with the C and D ,and the buttons A and B. You find the forest crane functioons which the different movements corresponds to. The 8 connectors of the steering cable are marked [1, 2, 3, 4, A, B, C, D] and should be connected to the solenoids so that they corresponds to the functions below .

The levers are installed so that the rollers are towards each other and the sticker is facing the driver. The rollers should be steerd with your thumbs.

NOTE! The A and B ,keys are different depending on whether it is the question of left or right stick. A button is labeled with a pit.





MOVEMENTS FOR THE LEFT JOY-STICK

1. Second boom down
2. Second boom up
3. Crane turning to the right
4. Crane turnng to the left

A Left stabilator down
B Left stabilator up
C Extension tube in
D Extension tube out

MOVEMENTS FOR THE RIGHT JOY-STICK

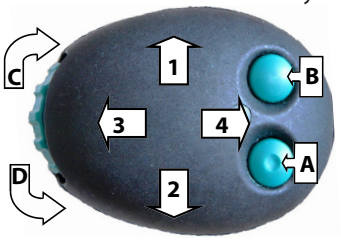
1. Main boom down
2. Main boom up
3 rotator counterclockwise
4 rotator clockwise

A Right stabilator up
B Right stabilator down
C Grapple closing
D Grapple opening

ERGO-DigiStick operating a Front Loader Valve

HOW TO CONNECT THE JOYSTICK TO THE VALVE AND HOW THE JOYSTICK MOVEMENTS CORRESPONDS WITH THE STEERING CABLE MARKINGS

In the picture below the directions of the joystick are marked with [1, 2, 3, 4]. The direction of the roll is marked with [C, D] and the buttons with [A, B]. Under the picture you find the functions which the different movements corresponds to. The 8 connectors of the steering cable are marked [1, 2, 3, 4, A, B, C, D] and should be connected to the solenoids so that they corresponds to the functions below.



The steering cable is connected to the solenoids as follows:
1 Loader down --- joystick forward
2 Loader up --- joystick backward
3 Tilt the bucket forward (bucket dump) --- joystick to the left
4 Roll back the bucket --- joystick to the right
A Floating contact (Hirschman contact) --- press the A-switch
B On-Off signal (if needed) --- press the B-switch
C Proportional output signal (if needed) --- roll forward
D Proportional output signal (if needed) --- roll backward

HOW TO USE THE FLOATING:

Activate the floating mode: Push the lever all the way forward and press the Aswitch. The LED light on top of the joystick indicates that the floating function is active. It is possible to use all movements when the floating is active.

De-activate the floating mode: A rapid press on the A-switch will de-activate the floating mode (LED light goes out)

NOTE: If one or more movements are slow, please control the servo pressure. Different circumstances (e.g. dirty return filter or severe cold) may raise the tank pressure, and because of that the servo pressure should be raised. 20-25 bar servo pressure is usually enough.

ADJUSTMENTS OF THE JOYSTICK
The initial and maximum speed for one or more directions

1. SET LEVER IN PROGRAMMING MODE
- Start the tractor (turn on the pump).
- Disconnect power from the levers.
- Press and hold the A-switch (the swith with a cavity)
- Turn the power on, wait for 5 seconds until the red LED light appears (this indicates that the joystick is now in programming mode
- Release the A button.

2. ADJUST THE INITIAL SPEED
- Take the lever / roller in the desired direction until the initial speed is achieved.
- Acknowledge by a quick press of the A button (max 1 second).
- Take the lever / roller in the center position (LED flashes).

IF YOU NOW WANT TO:
Adjust the maximum speed of the direction: Go to paragraph 3
Adjust the the initial speed for a different direction (if you do not want to adjust the maximum speed for this direction): Repeat point 2
Exit the programming mode: Go to section 4

3. ADJUST THE MAXIMUM SPEED LIMIT
- Take the lever / roller in the direction that you just adjusted initial speed of (paragraph 2), until the desired maximum speed is reached.
- Acknowledge by quickly pressing the A button (max 1 second). The movement will now stop softly.
- Take the lever / roller in the middle position (the LED flashes).
- If you now want to:

Adjusting beginning - and possibly the maximum speed of a different direction:
Go to paragraph 2
Exit programming mode mode: Go to section 4

4. EXIT THE PROGRAMMING MODE
Press and hold the A button (several seconds), the LED flashes, then release the A button. Now you can use the lever.

HOW TO RECALL THE FACTORY SETTINGS

A fast recall of the factory settings is done with the roll. The recall does not effect the dead bands (see page 32 for further information) or the potentiometre limits.

FAST RECALL OF THE FACTORY SETTINGS WITH THE ROLL

1. Switch off electric power from the joystick
2. Either push or pull the roll the roll to its maximum position
3. With the roll in one of it maximum positions: switch on the electrical power to the joystick (the LED light will now be alight for 1 secound)
4. Let the roll go back to its original position
5. The joystick is now ready to use

After recalling the factory settings, the start current is relatively low (ensuring that all functions will have a smoth start) and the max current is very high (ensuring that all functions certainly get enough current to reach full strength/movement speed). Because of this wide current range (low minimum current and high maximum), there is probably a need to tune up individual movements for the best driving comfort.

HOW TO CHOOSE THE RAMPS

The idea with a ramp is to achieve a softer start and stop of a selected movement. This makes the driving much smoother and more comfortable. Smoother stops are also more gentle for the crane and may increase the life time of it. When following the instructions you will be asked to see which ramp-mode is active by counting the number of LED flashes. Below is a list of what ramp a specific number of LED flashes indicate:

1 flash = no ramps
2 flashes = ramp on 0.2 seconds
3 flashes = ramp on 0.4 seconds
4 flashes = ramp on 0.6 seconds
5 flashes = ramp on 0.8 seconds

Installing ramps to one or several functions

1. Switch off electric power of the joystick (the hydraulic pressure can be on or off, there are no signals to the solenoids)
2. 2. Move the lever/roll to the selected direction (corresponding the function you will change ramp-mode to) and press and hold the B-switch (the switch without cavity)
3. Now, switch on the electric and wait for 5 seconds until the LED light lightens (indicating that the joystick is in ramp-programming mode)
4. Release the B-switch but keep the lever/roll to the selected direction
5. Press the B-switch quickly (max 1 second) and count the number of LED flashes to find out the current ramp-mode for this direction
6. If you want to change the ramp-mode: press the B-switch to increase the number of flashes and A-switch to decrease it. Do this until you have reached the desired number of flashes (the desired ramp-mode).
7. If you now want to:

a. Exit the programming mode and start to use your joystick: let the lever/roll go back to the centre position and press and hold the Bswitch until the LED light start to shine. After this you can release the switch and start to use the joystick.

b. Change the ramp-mode for another function: follow instructions 2 to 7 for the new function.

HOW TO ADJUST THE DEAD BANDS

A deadband is an area of regulation range where no action occurs. The purpose is to prevent involuntary power feeding to the coils. If no deadband is defined, the electronics is feeding random signals to various coils, and if the deadband is set too narrow, even a small unintentional movement of the lever can cause a harmful additional reaction.

As an example: A small side movement of the joystick can cause the rotator to turn when the attempt was to rise or lover the main boom of a forest crane. Setting the deadbands will always recall, by the program selected current values. Because the current values starts from low, at all lever directions of the joystick (even the thumb roll) shall all hydraulic movements start smooth from a low level, without any preset speed. The current starting from low level will lead to a relatively long lever movement for gaining a required current for start in some functions. To adjust these function to start smooth, immediately after the deadband, please read the manual at page 6

THE PROCEDURE TO SET THE DEADBANDS / RETURNING THE FACTORY SETTINGS:
(the hydraulic pressure can be on because the joystick will not give any out signal) Note: At the referred switches A and B, A is marked with a cavity.

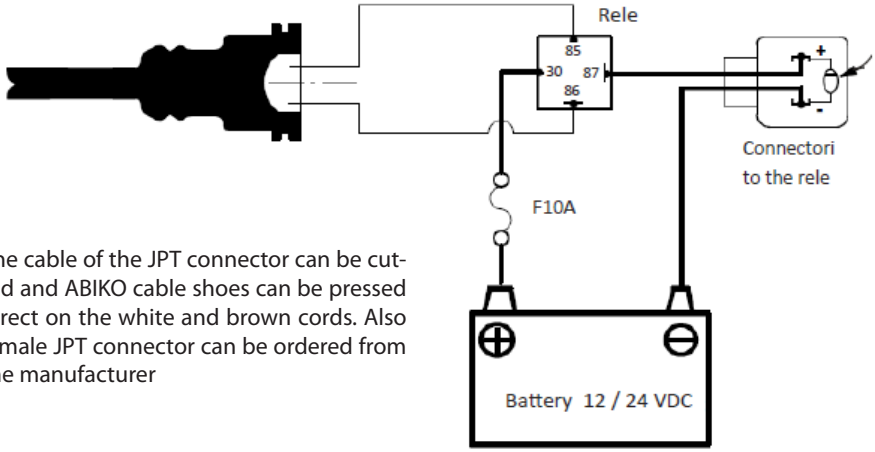
1. Switch off the power from the joystick
2. Press and hold A and B switches.
3. Turn on the power to the joystick, still holding A and B pressed until the red light come on after 5 seconds. Then let off the switches.
4. To set the deadbands at the joystick move the lever apr. 10 mm in every direction, also the roller apr. 2 mm forward and back.
5. Press A switch to register the deadband values (just press, don't hold)
6. The red light will flash to indicate the registered values.
7. Move the lever to the maximum position in all directions, also theroller.
8. Press A switch to register the maximum lever values.
9. The red light will now be on for 1 second to indicate the finished procedure.
10. The joystick is now ready for use.

Note: The length of the deadbands can be set longer than 10 mm if wanted but not shorter to avoid earlier mentioned unintentional movements.

OPERATING ADDITIONAL SOLENOID VALVES BY USING A RELE

Junior Power Timer (JPT) connectors B, C and D of the joystick's steering cable can be used for operating external electrical components like selector valves in a front loader. These coils normally need higher current than one channel of ERGO-DigiStic can supply (2A). Therefor a rele is needed. Notice that the signal to the terminals 85 and 86 is taken from the JPT connector. Using external souces , plus or minus, will destroy the PCB card of the joystick!

NOTE: Very important to place a diode to cut the high voltage peaks caused by the coil!!

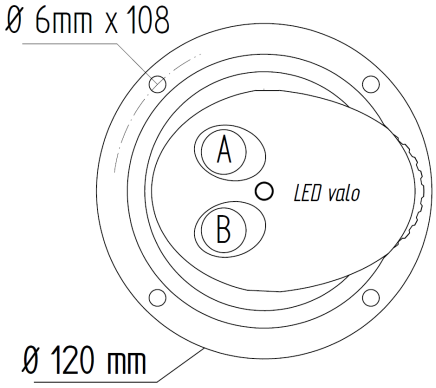


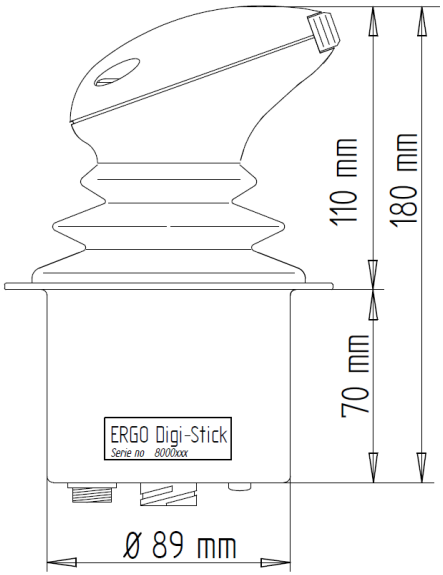
The cable of the JPT connector can be cutted and ABIKO cable shoes can be pressed direct on the white and brown cords. Also a male JPT connector can be ordered from the manufacturer

B connector gives direct current C and D gives puls wide regulated current (PWM) which makes the rele to "vibrate" on low currents. The vibration will disappear with full PWM. The vibration can also be avoided by connecting a 100 µF condensator between terminals 85 and 86 on the rele. Notice that the polarity has to be right when the condensator is used.

About the electronics

- The lever control with PMW 100 Hz
- MAX 2 A
- 12/24 VDC
- 8 channels:
    - 6 analog (proportional functions)
    - 2 digital (on-off function)
- Over-current control will automatically turns off the power if thw value is incorrect
- LED light flashes if something is wrong





WARRANTY TERMS AND CONDITIONS

Validity of the warranty	- Kelifri's Warranty is valid 12 months from the date of purchase.
This warranty replaces	- Compensation for spare parts after acknowledgment that the fault lies on the material or manufaturing deffects.
This guarantee do not cover	• Labour costs • Travel expenses • Any modification that the buyer himself has/had made. • Any consequential damages that occured out of damage to the machine. • Damage due to normal deterioration of the machine, inadequate: service, user inexperience or use of spare parts which are not original. • Wear parts such as hoses, seals, oils, and mechanical belts

EG-FÖRSÄKRAN OM MASKINENS ÖVERENSTÄMMELSE, ORIGINAL

EC-DECLARATION OF CONFORMITY
According to 2006/42/EC, Annex 2A
CE
Kellfri AB
Munkatorpsgatan 6
532 37 Skara, Sweden

Declares that the machine
Name: 21-ELPV8
Type: Electric propotional valve 8 sections

Complies with all applicable provisions of the Machinery Directive 2006/42/EC.
Other equipment must meet the hardware requirements of the Directive.

Tina Baudtler, VD

Kellfri AB is constantly working on further developing their products and therefore reservesthe right to modify, among other things the design and appearance without notice.

CUSTOMER SERVICE
You are always welcome to give your feedbacks, reviews or ask us about our tools and products.