



C97 SERIES PROPORTIONAL CARD USER'S MANUAL



PLEASE READ THE INSTRUCTIONS BEFORE USE!



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PURPOSE

To control fluid passing in between solenoid valves and similar product with 4 – 20 mA current in a proportional way.

Reasons to use proportional solenoid valves,

- They are economic.
- They react fast and consume less energy.
- They are improvable.
- They can control sensitively.
- With the feature of PWM they save current.
- Even if the electricity gone settings would not corrupt and they continue working on.

BASIC INFORMATIONS

In this system a special electronic circuit card is designed for solenoid valves. In this circuit, PWM method provides to pass fluids through the valves proportionally with open and close movements in different frequencies.

In this electronic circuit, for controlling flow amount with frequency 4 – 20 mA signals are used which are also commonly used in automation industries. In this circuit start from 4 mA, the increasing current causes increasing valve's working frequency and also increases fluid flow. The electronic card designed to be settable by users in between different frequencies for reducing factors like flowing pressure and fluid viscosity.

TECHNICAL SPECIFICATION

Working Voltage : 12 / 24V DC

Maximum Current : 1.5A

Controlling Range : 4 – 20 mA

Appearance : It carries 2 buttons on it which are “SLC” and “OK”.

It has 7 leds. 5 of them are setting leds, 2 of them are lower and higher limit leds.

Changable Setting Options: Lower and Higher Limit Settings

PWM Increasing and Decreasing Frequency
Settings

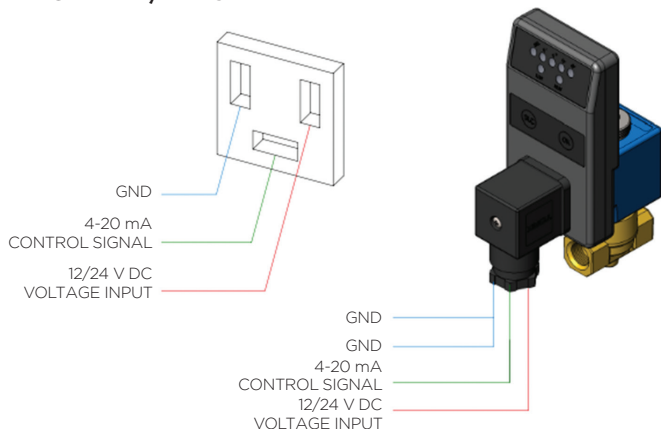
To save and delete setting options.

HOW IT WORKS

Between 4 – 20 mA taken from another device provides proportional flow controlled by lower and higher current limits. When it is “4 mA” valve is fully closed and “20 mA” makes it fully open.

When the current taken from external device passes beyond the setted “Higher Limit”, HLW led turns on and warns us as “Higher limit is exceeded”. When it is below than the “Lower Limit” LLW led turns on and warns us as “Lower limit is deceeded”. Besides of this, there is also decreasing/increasing frequency and deleting settings.

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EXPLANATIONS

On the Proportional Circuit Card there are two buttons as "OK" and "SLC".

"OK" button : Saves the settings to the PIC memory.

"SLC" button : Choses the setting which wanted to be set.

HL : "Lower Limit Setting" led. It turns on the 1st. press on "SLC" button.

LL : "Higher Limit Setting" led. It turns on the 2nd. press on "SLC" button.

F+ : "Increasing Frequency" led. It turns on the 3rd. press on "SLC" button.

F- : "Decreasing Frequency" led. It turns on the 4th. press on "SLC" button.

DEL : "Deleting Memory" led. It turns on the 5th. press on "SLC" button.

HLW : "Higher Limit" led. It turns on when higher limit exceeded.

LLW : "Lower Limit" led. It turns on when lower limit deceeded.

SETTINGS

Before setting the solenoid valve as it shown in the figure 7, connect 12 / 24V DC power source's (-) output to the terminal number 1. Also connect external current source's (-) output to the terminal number 1. Connect power source's (+) output to the terminal number 2 and also connect external current source's (4-20 mA) output to the terminal number 3.

Lower Limit Settings:

1- Set the fluids flow to the desired minimum amount (or 0 flow amount)

2- From the device which gives 4 - 20 mA output;
Set the current as 4, 5, 6, 7, 8 as lower amounts.

3- Press 2 time to "SLC" button to turn LL led on **1**

4- When the LL led turned on, push "OK" button to save preferred lower limit to the memory **2** LL led will blink. After the saving turn off the systems energy and turn it on again. System will continue to work as it saved.

5- After finishing all the process, when saved lower limit current signal given to the system, system will set flow amount as it set on the step number 1.



Fig 1. Lower Limit Settings

Higher Limit Settings:

1- Set the fluids flow to the desired maximum amount.

2- From the device which gives 4 – 20 mA output;
Set the current as 16, 17, 18, 19, 20 as higher amounts.

3- Press 1 time to “SLC” button to turn HL led on **1**

4- When the HL led turned on, push “OK” button to save preferred higher limit to the memory. **2** HL led will blink. After the saving turn off the systems energy and turn it on again. System will continue to work as it saved.

5- After finishing all the process, when saved upper limit current signal given to the system, system will set flow amount as it set on the step number 1.



Fig 2. Lower Limit Settings

! After setting “Lower Limit” and “Higher Limit” press “SLC” button 6th. times will turn off LL, HL, F+, F-, DEL leds. Press “OK” button to save Lower and Higher Limit settings. After setting LL, HL, F+, F-, DEL leds will blink at the same time. Turn off the systems energy and turn it on again. System will continue to work as it saved. Frequency for the existing system can shortly called as open-close movement of coil in a certain period of time. fluid's flow is directly proportional with frequency.

As the frequency amount is increased, flow amount will increased and as the frequency amount is decreased, flow amount will decreased.

Increasing Frequency:

- 1- Press "SLC" button 3rd. times to turn on F+ led **1**
- 2- Press "OK" to increase frequency **2** Everytime you press "OK" button F+ led will blink. When F+ led blinks it means PWM frequency is increased. Turn off the systems energy and turn it on again. System will continue to work as it saved.

Decreasing Frequency:

- 1- Press "SLC" button 4th. times to turn on F- led
- 2- Press "OK" to decrease frequency Everytime you press "OK" button F- led will blink. When F- led blinks it means PWM frequency is decreased. Turn off the systems energy and turn it on again. System will continue to work as it saved.


Deleting Settings:


- 1- Press "SLC" button 5th. times to turn on DEL led
- 2- If the DEL led is on press "OK" button to delete the memory All the leds (LL, HL, F+, F-, DEL) will blink respectively. Setting memory deleted. System will continue working in factory settings. Do not forget to set it again.





Şekil 3. Increasing Frequency Settings, Decreasing Frequency Settings, Deleting Settings


PRODUCT INSTALLATION


 Before assembly, please make sure that there are no damages with the product and all required parts are available. The product should not be accepted in the case that it is damaged or if there are missing parts. Before using our products, please check the labels and other information on the product and package. Before assembly, please make sure that the line pressure does not exceed the maximum pressure specified on the product label. Before assembly, please check the compatibility of the product to be assembled with the system to be used. The operating limits specified in the technical specifications section should not be exceeded. Before assembly, please make sure that there is no flow in the line where the coil will be connected, and that such possibility has been prevented during the assembly.


 The coil gets hot in long-term operations. The hot coil may cause burnt if touched.

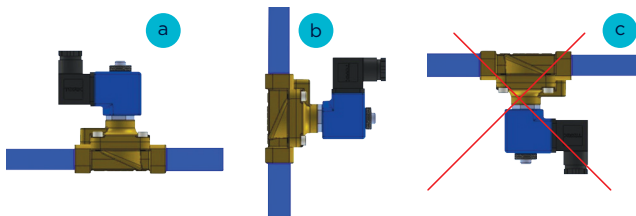
 The power should be connected to the coil via a socket, which should be closed. The open connections may cause electric shock and short-circuits.

 The coil should not run without tube. It means that it should run only when it is connected to the valve along with the tube and core. Otherwise, the conducting wire in the coil will burn and become dysfunctional within a short time.

 The coil should be operated along with its own cap nut. The lack of cap nut may also cause damages to the coil or not to run.

 Every coil should operate under the voltage limits written on it. The higher or lower voltages may cause damages to the coils or not to run.

 Filters should be used for required fluids. The residuals and rusts accumulated in the valve may cause inconveniency for the coil to pull the core. This inconveniency may cause burn of the core.

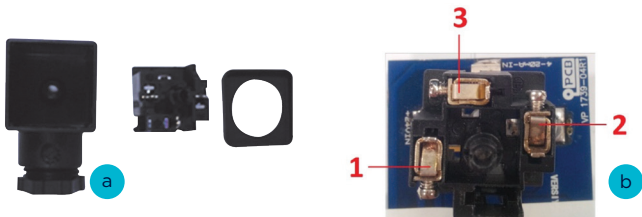


Sekil 4. . Solenoid valve connection form (a) Right, (b) Right, (c) Wrong.

❗ The pressure on the solenoid valve should be set to zero before removing it from the system.

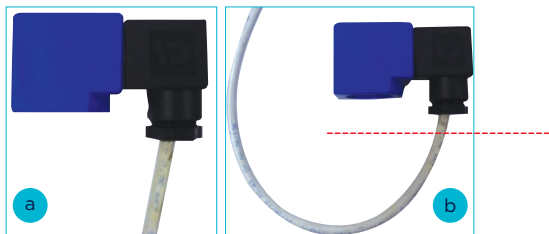
❗ In solenoid valve assembly, please be careful that the coil should not be at the lower part when conducting assembly. Otherwise, the core in the valve will be affected by the residuals and rusts accumulated in time and prevent the coil to move the core. The solenoid valve may be assembled as shown in Figure 4 a or Figure 4 b.

❗ A filter should be used, if there are particles in the fluid to be used.



Sekil 5. (a) Connector inner parts, (b) Connector connection points

⚠ When connecting the cable ends to the sockets, the positive (+) and negative (-) terminals should be connected to the number 1 and 2 connections. The 3rd terminal should be connected with the 4 - 20 mA signal input.



Şekil 6. The position of the connecting cable (a) Right (b) Wrong

⚠ Any bending or twisting should not be found with the cable connected to the socket in order to avoid any deficits resulting from any loose contact or short-circuit due to any crush. The cable should be uprights as shown in the Figure 8 a. In addition, the twists in the socket input may allow humidity to penetrate into the socket. In order to prevent humidity or water to leak into the socket, the diameter of the cable should be in a size that provides sealing.

PRODUCT CARE AND MAINTENANCE

The solenoid valve is opened and the parts are examined and washed with the pressure water. Particularly the core, diaphragm, diaphragm spring and orifice should properly be cleaned. The burrs and residuals on them should be removed. The damaged parts, if any, should be replaced with original TORK brand spare parts. The spare parts may be supplied from our company.

Please be careful not to damage the sensitive inner parts during care and assembly. After any care or maintenance, the electrical connections should be checked, the required electrical measures should be taken and it should be tested if the valve is operating or not.

PRODUCT SPARE PARTS

The spare parts of the solenoid valves:

- Diaphragms
- Tube – core
- Coil
 - Standard coil/Ex-proof
 - Large coil
 - Mini coil/Ex-proof
- SOCKET
 - Led sockets
 - Normal sockets

You should choose the spare parts in the size compatible with the valve you use. Please contact our company to supply the spare parts and further information.

PRODUCT SHIPMENT

During shipment, the valve should not fall down or be exposed to solid impact. In addition, the hive and coil parts should also be protected from any damages. The weights that may damage the valve should not be placed on the packages of the solenoid valves. The products should be shipped in their original cardboard boxes.

WARRANTY PERIOD FOR THE PRODUCT

The warranty period for the TORK brand solenoid valves is 2 years. The maximum repair period is 20 days. The warranty does not include products if the valves are used out of scope of the terms of use specified when ordered from our company or in case of breaks resulted from the user's fault when the user try to conduct the care and repair of the product. To benefit from the warranty, please apply to the manufacturer company with the warranty certificate approved by the company within the warranty period. In the case when you send the pneumatic piston valve via courier, please remember to add a description your complaint, the photocopy of your warranty certificate, your address and telephone number.

FIRM INFORMATIONS SMS SANAYİ MALZEMELERİ ÜRETİM VE SATIŞI A.Ş.

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Fax :+90 262 290 20 21
e-mail : tork@smstork.com

WARRANTY CERTIFICATE

Manufacturer:

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e-mail : tork@smstork.com
Representative Signature:

Firm's Cachet:

Seller:

Title :
Address :
Phone :
Fax :
e-mail :
Receipt Date :
Delivery Date and Place :
Representative Signature:

Firm's Cachet:

Product Name:

Trademark: Digital Timer
Model : TORK
Modeli : C 96

Warranty Period: 2 yıl
Max. Repair Time: 20 iş günü
Serial Number:

WARRANTY CONDITIONS

- 1- The warranty period is two (2) years and starts from the date of delivery of the product to consumers.
- 2- All products, including all sub-ports, covered by our warranty.
- 3- If there is a fault caused by the production, the manufacturer will repair or replace the defective product in its sole discretion.
- 4- The details of product's warranty conditions are in our website.



SECTOR
LEADER WITH
30 YEARS
EXPERIENCE







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