

Jan de Bloois

ABSORPTION FRIDGE TROUBLES

What could be the matter if the refrigerator in your motorhome does not want to stay on?



INTRODUCTION

An absorption refrigerator, as standard in many motorhomes, is actually a great invention. There are no moving parts (door and freezer compartment not included!), you don't hear it, it works on gas, when you drive it can work on 12 volts, and if you have 'shore power' available: it also works on 230 volts.

Despite that, it can sometimes stop, or cool less well. Or everything seems to work, but it keeps going out after ignition on gas.

The latter was the case with us.

In this description I mainly go into the latter, enough has already been written about the other things that can go wrong, but I had not come across this specific problem before.

Together with my technically proficient friend John, we found the problem and solved it.

During this process I took some pictures, which I will try to explain what was wrong.



De Thetford koelkast in our Hymer Exsis SG



A fridge in a camper is very important

How does it work?

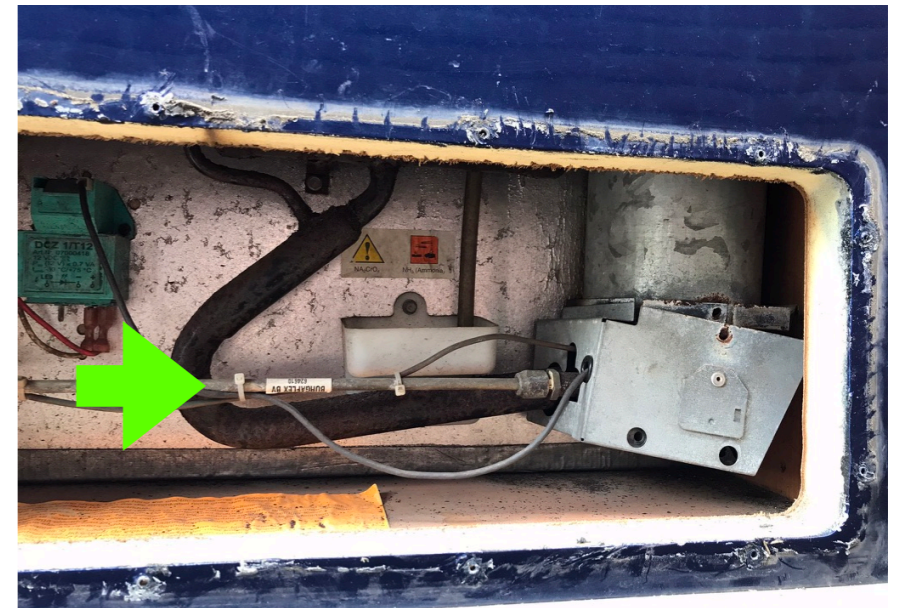
If you want to fix something, it's useful to know how something works. *What* happens when you turn something on, or rather: what *must* happen, and why doesn't it happen?

If you switch the refrigerator from the OFF position (left button on our Thetford refrigerator) from '0' to GAS, the piezo igniter is switched on. This creates sparks near the burner. A special ignition coil provides the high voltage. You will hear "tap-tap-tap" when this happens. You now have to hold down the right button, see red arrow. The gas is now passed through, and flows from the right (yellow arrow) to the right (green arrow) and from there to the burner. I also put a green arrow on the top photo. The gas ignites, and the burner works. (photo 2). There is also a thermocouple in the flame. When heated it gives off a very small voltage, and that voltage goes to

an manually operated gas valve, directly opposite the red arrow. That small voltage is just enough to keep the throttle open by a small electromagnet. You no longer have to keep the button pressed, the gas valve ensures that the gas continues to flow to the burner. A small meter indicates that there is indeed a small current flowing.

If the flame should blow out, or if the gas has run out, the thermocouple will no longer supply voltage, the gas valve will go off again, and the gas supply will stop. So it is a security. There is a delay of several seconds between the flame going out and the gas valve closing. If there is gas again within that time, the ignition will become active again, and the gas will ignite again.

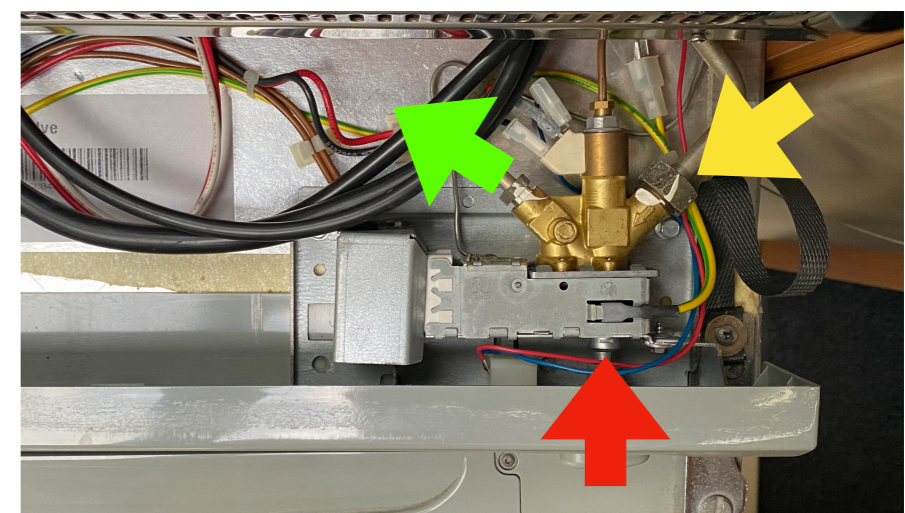
If the refrigerator is set to 12V or 230V, the gas valve is always closed. Then no gas flows.



The gas burner of the fridge



It works!



The gas valve on top of the fridge costs about €90

Simplified schedule

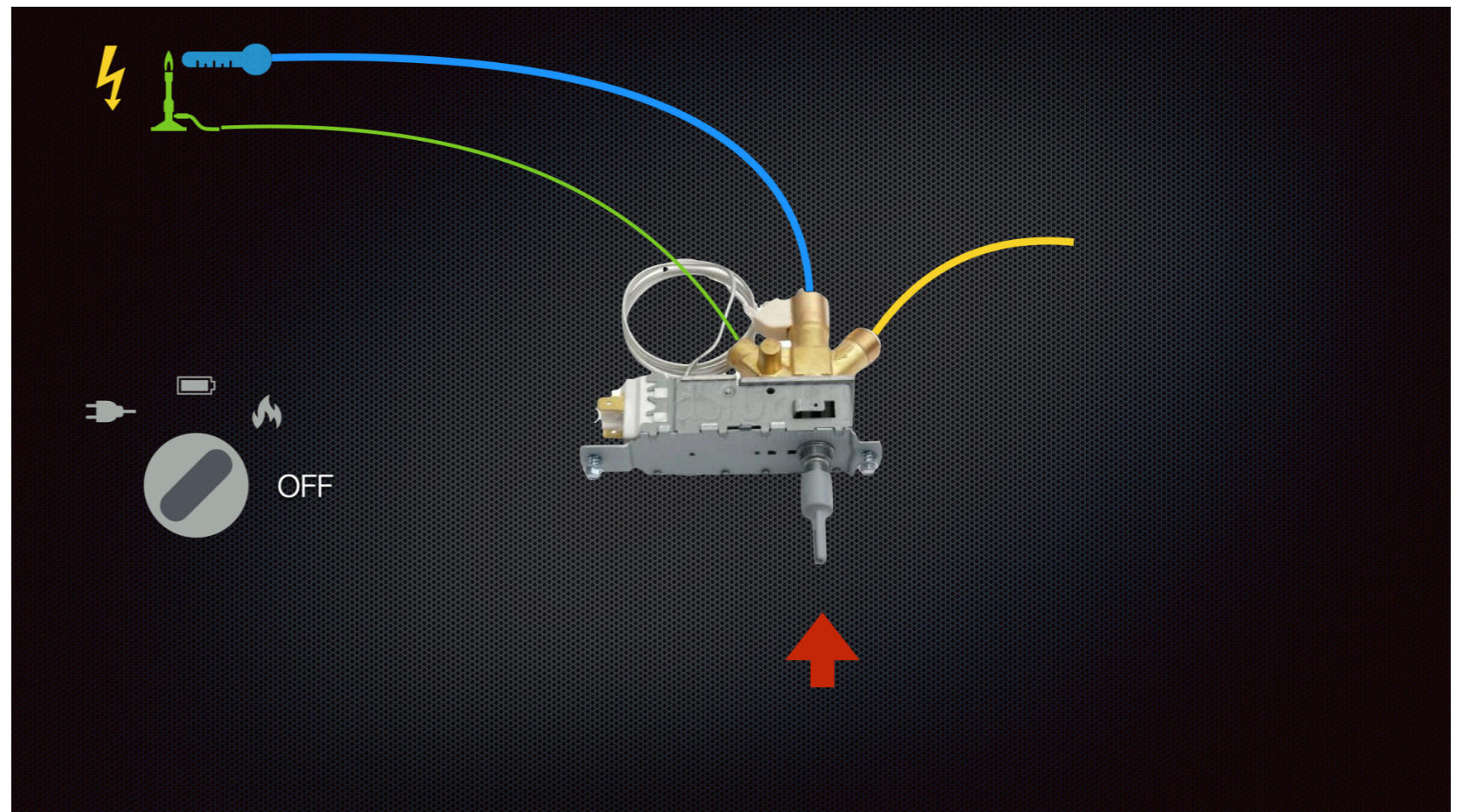
Here is a simple overview of the previously mentioned parts.

In the middle the gas valve. YELLOW the gas supply pipe, GREEN the pipe to the burner, with at the end... the burner. The yellow lightning bolt is the ignition. BLUE is the thermocouple.

The left knob is in the GAS position.

The spark ignites the gas, the thermocouple keeps the gas valve open when the flame is burning.

The gas flow is started by briefly pressing the right button.



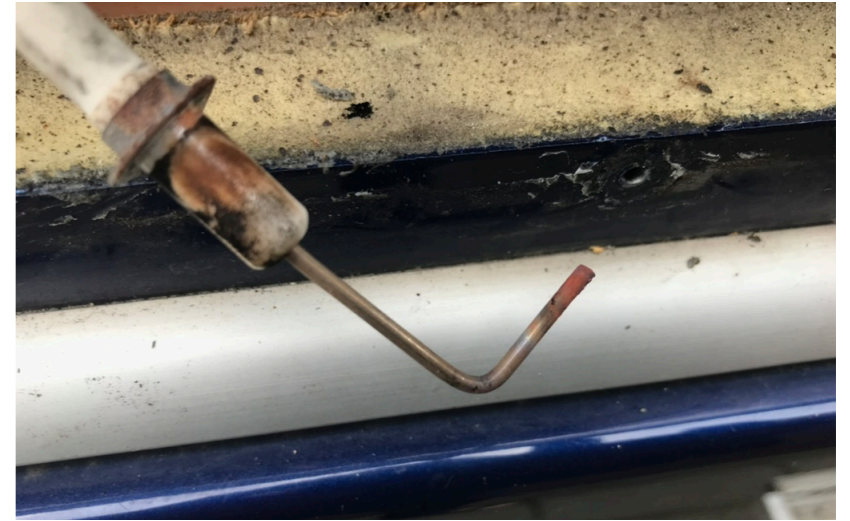
On the left the shift roller, now in the GAS position. Sparking starts. Press the right button. The gas flows.

It does not work!

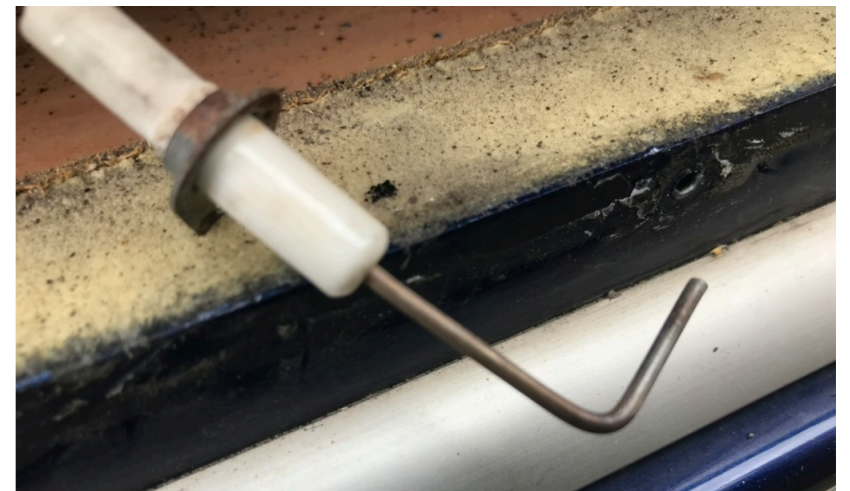
The problem with our refrigerator was that you had to keep the right button pressed for a long time. The meter went up very slowly. After cleaning the igniter, and cleaning the burner it got a little better, but the gas valve was still very difficult to stay open.

To reach this, the refrigerator must therefore be moved forward a little.

I will show you how this works on the next page.



The igniter needs to be cleaned.



The igniter is clean again



Burner, igniter and thermocouple are clean

Detach refrigerator

Start by removing the four white plastic caps from the inside of the refrigerator. Two on the left, and two on the right.

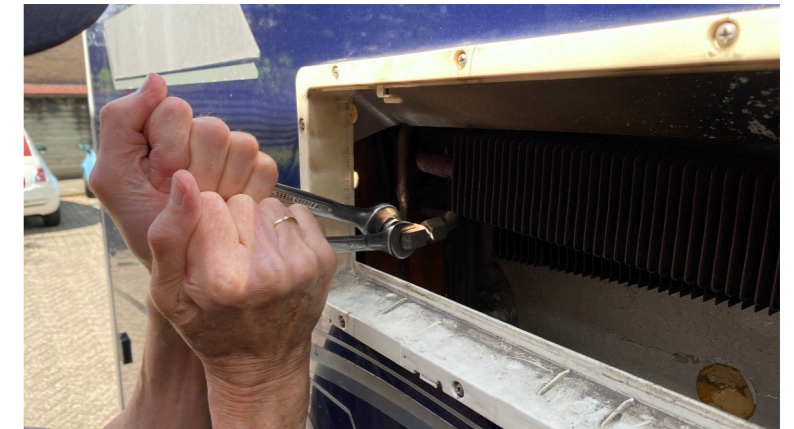
After this, the upper grille on the outside must be removed. You do this by sliding the two sliders at the top to the middle. The grid can then be removed. Then also remove the mesh grid. Finally, unscrew the grille frame. After loosening all the screws, it is still attached, because this framework is also sealed.

Then loosen the gas pipe at the top left, and the saddle, with which some power cables are attached to the wood above the refrigerator. Now gently push the top and bottom of the refrigerator to slide it in. If there is also someone inside to pull it is a lot easier.

De koelkast hoeft er niet helemaal uit, als je bij de genoemde componenten kan is het goed.



Loosen these 2 screws, there are also 2 on the left.



Use two wrenches. Loosen the left nut, hold the 90° piece.



The gas pipe is now loose



Loosen one screw from the saddle for the cables

Disconnect thermocouple

The problem with our refrigerator was that you had to keep the right button pressed for a long time. The meter went up very slowly. After cleaning the igniter, and cleaning the burner it got a little better, but the gas valve was still very difficult to stay open.

A friend of mine, John, said that sometimes there is a little contact resistance between the end of the thermocouple lead where it enters the gas valve.

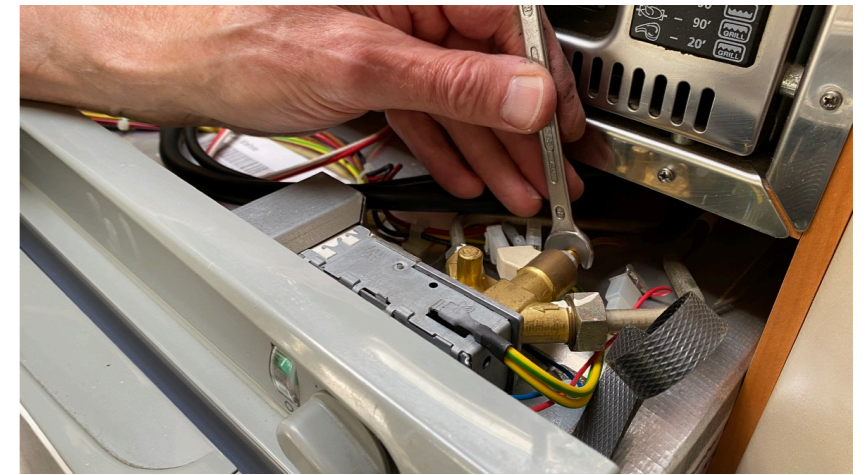
To reach this, the refrigerator must therefore be moved forward a little. This has now been done. With the right tools, the copper pipe can now be detached from the thermocouple. Take a piece of very fine sandpaper and gently sand the end. Reinstall the

pipe. Don't do that with too much force!

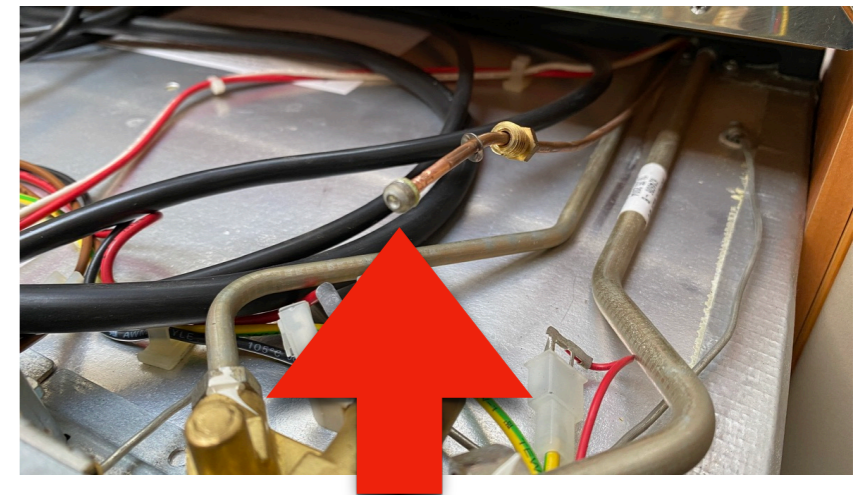
After this we slid the refrigerator back and reconnected the gas pipe.

Time for a test.

It seemed to go a little better, but if you moved the left switch just a little bit, the throttle went off again, and the ignition started to spark again. Something isn't right there.



Carefully unscrew the thermocouple lead



Lightly sand the end with very fine sandpaper



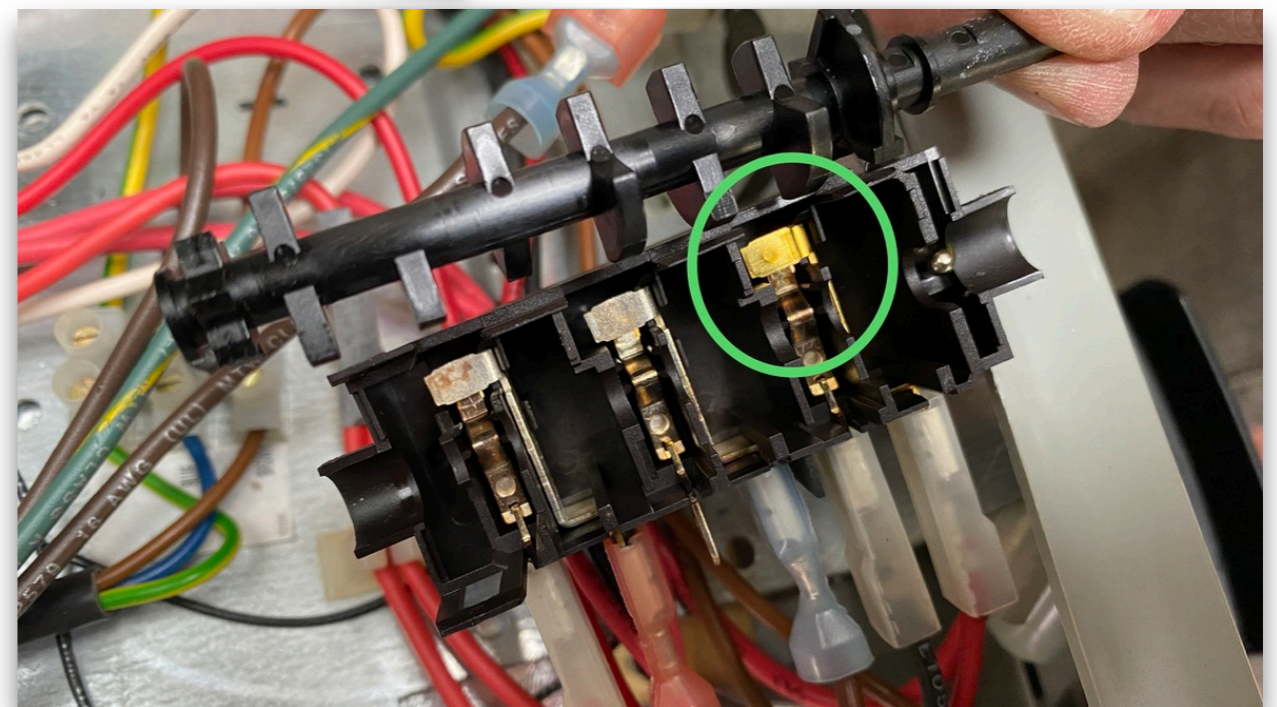
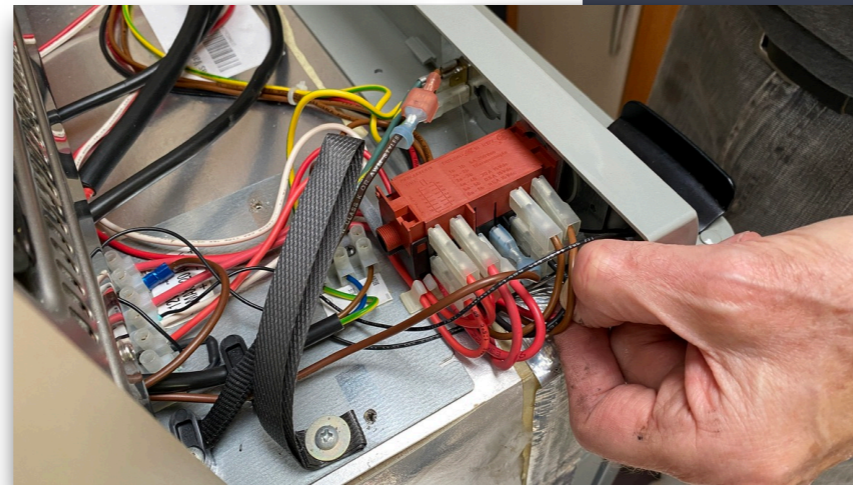
A very clear explanation about replacing the thermocouple of the refrigerator can be found on the website of the NKC, the Dutch Camping Car Club.

Here the link! <https://www.nkc.nl/camper-klusvideos/keuken/hoe-vervang-je-de-thermokoppel-van-de-koelkast/>

Shift roller is the culprit!

Things go wrong in the so-called switching roller. It's behind the left button. In fact, this is a 4-position switch, which operates three switches. The switch closest to the front is for the throttle. The other two switch the 12 volts and 230 volts respectively. And that is precisely the problem: the contacts in this switch are well suited for large voltages and large currents, but NOT for the minimum current of the thermocouple! The slightest dirt or corrosion on these contacts already ensures that too little current passes through the gas valve, so that it does not stay open, even if the thermocouple does its best. With some contact spray and some turning of the switch, the contacts will hopefully be clean enough again.

If the problem comes back, I will install a reed relay. See next page.



If this doesn't help either....

The refrigerator is now working very well again. Open the main tap, selector switch to GAS, sparking starts, hold the right button down for a while, the burner lights up, the meter turns green, release the right button (don't have to slowly!), and the burner stays on. As it should.

Just a test: if you close the main tap in the sink cabinet, the igniter will spark again. The throttle valve should remain open for about 20 seconds. When the gas comes back, the burner immediately ignites again. If you wait longer, you will hear, with a soft click, that the gas gas valve closes again. When the main tap is now turned on again, you will have to press the right button again.

If the problem returns, there is a simple and inexpensive solution. The unsuitable contact lets you control a relay, and the contact of this relay controls the gas valve.

A relay like this costs about €4.50, for sale at Conrad, among others.

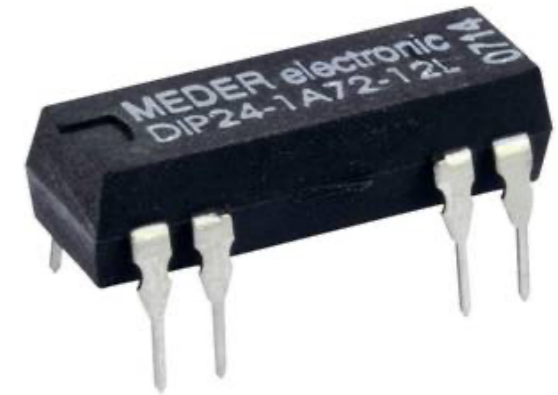
<https://www.conrad.nl/nl/search.html?search=reedrelai>

It is beyond the scope of this manual to fully describe how to wire and connect this. For many people this is going too far to do this themselves.

If there is a need, please email me.

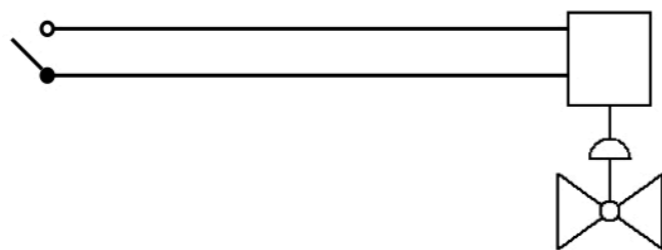
I can give a simple diagram here, see the last page.

I hope that this information has been of some use to you.

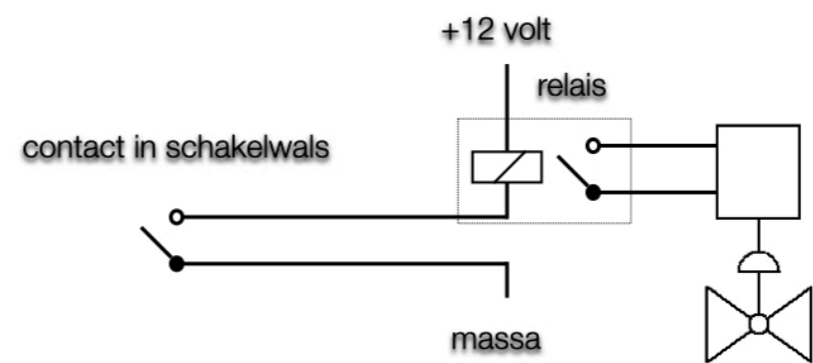


A reed relais of 12V DC

contact in schakelwals



het symbool van een klep



het symbool van een klep