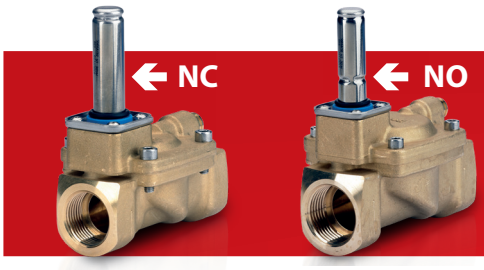


ENGINEERING TOMORROW

Troubleshooting solenoid valves – NC normally closed (armature tube is straight without dent, see image above)

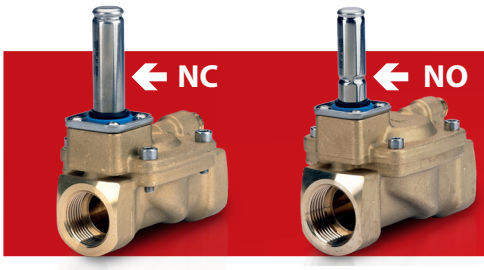
Symptom: Solenoid valve does not open, no flow	Comment	Check
Power should be on coil but valve is **closed**. Voltage on coil?	No.	Check coil supply: Is supply activated? If not – supply or fuse may be defect.
Power should be on coil but valve is closed. Voltage on coil?	Yes.	Use a magnetic detector. Lift coil slightly and note whether it offers resistance against lifting. Eventually use a permanent magnet. **NOTE:** Never remove a coil with voltage applied for more than 2 seconds – it may burn out.
Power should be on coil but valve is closed. Correct coil / correct coil voltage?	Data sheet / store.danfoss.com	Check to make sure the coil's electrical requirements are the same as the installation supply.
Differential pressure too high.	Data sheet / store.danfoss.com: Diffential pressure too high for body or coil?	Check coil data. If necessary, replace coil with correct version. Reduce differential pressure, e.g. by limiting inlet pressure.
Differential pressure too low.	Data sheet / store.danfoss.com: Differential pressure too low for body?	Check valve body data and differential pressure. If necessary, replace valve body with correct version.
Damaged / bent armature tube.		Replace valve.
Dirt / deposit blocking armature or diaphragm too stiff.		Clean orifice with needle or similar (max diameter 0.5 mm). Blow clean with compressed air. If necessary, replace defective component(s).
Dirt / deposit in pilot hole.		Clean pilot hole with a pin or needle.

Symptom: Solenoid valve partly opens, low flow	Comment	Check
Differential pressure too low.	Data sheet / store.danfoss.com: Differential pressure too low for body?	Check valve data, incl. differential pressure. Replace valve with correct version.
Damaged or bent armature tube.		Replace valve.
Dirt at diaphragm / diaphragm damaged.		Clean diaphragm. If necessary, replace defective component(s).
Armature partly blocked / dirt or deposit in armature tube.		Clean valve. If necessary, replace defective component(s).

Symptom: Solenoid valve does not close/partly closes	Comment	Check
Voltage remains on coil.		First lift coil slightly and note whether it offers resistance against lifting. **NOTE:** Never remove a coil with voltage applied for more than 2 seconds – it may burn out.
Dirt on main orifice, or on pilot orifice, or equalizing orifice in diaphragm, in armature tube or equalizing unit blocked.		Clean orifice with needle or similar (max diameter 0.5 mm). Blow clean with compressed air. If necessary, replace defective component(s).
Pulsation in pressure line. Differential pressure too high in open position. Pressure on outlet side periodically higher than pressure on inlet side.		Check valve data. Check pressure and liquid flow. Check rest of installation. Replace valve with a more suitable alternative.
Damaged or bent armature tube.		Replace valve.
Defective valve plate, diaphragm or valve seat. Dezincification, dirt, deposit or damage on main or pilot orifice.		Check pressure and liquid flow. Replace defective component(s).
Diaphragm upside down.		Check correct installation of valve (see instruction/datasheet).

Symptom: Solenoid valve making noise	Comment	Check
Hum.	Only on AC voltage 50/60 Hz.	Hum caused by AC frequency can be removed by changing to coil with rectifier. Inspect and clean inside armature and armature tube. Can also be dirt or armature or spring worn out / defect (Replace valve or parts).
Water hammer when valve opens. Water hammer when valve closes		See installation guide. Pipes very long and pipe diameter too small.
Differential pressure too high and / or pulsation in pressure line.		Check valve data. Check pressure and liquid flow. Check for back pressure. Check rest of installation. Replace valve with a more suitable alternative.

Symptom: Coil burnt – melted; coil with voltage on	Comment	Check
Incorrect voltage / frequency.		Check coil data. If necessary, change to correct coil type. Check wiring diagram and wiring. Check maximum voltage variation: Permissible voltage variation: +/- 10% for dual frequency; DC and NO applications +10% / -15% for AC on single frequency voltages.
Differential pressure too high.		Check coil data. If necessary, replace coil with correct version. Reduce differential pressure, e.g. by limiting inlet pressure.
Coil short cut because of humidity, wrong coil IP rating, too high ambient temperature, too high media temp.		Check coil data and differential pressure and ambience temperatures and media and check with coil and valve specifications.
Damaged / bent armature tube.		Replace valve.
Dirt at armature / armature tube / armature stuck.		Clean armature tube and armature. If necessary, replace defective component(s).



ENGINEERING TOMORROW

Danfoss

Troubleshooting solenoid valves – NO normally open (armature tube is straight with dent, see image above)

Symptom: Solenoid valve does not open, no flow	Comment	Check
Power should be on coil but valve is **open**. Voltage on coil?	No.	Check coil supply: Is supply activated? If not – supply or fuse may be defect.
Power should be on coil but valve is closed. Voltage on coil?	Yes.	Use a magnetic detector. Lift coil slightly and note whether it offers resistance against lifting. Eventually use a permanent magnet. **NOTE:** Never remove a coil with voltage applied for more than 2 seconds – it may burn out.
Power should be on coil but valve is closed. Correct coil / correct coil voltage?	Data sheet / store.danfoss.com	Check to make sure the coil's electrical requirements are the same as the installation supply.
Differential pressure too high.	Data sheet / store.danfoss.com: Diffential pressure too high for body or coil?	Check coil data. If necessary, replace coil with correct version. Reduce differential pressure, e.g. by limiting inlet pressure.
Differential pressure too low.	Data sheet / store.danfoss.com: Differential pressure too low for body?	Check valve body data and differential pressure. If necessary, replace valve body with correct version.
Damaged / bent armature tube.		Replace valve.
Dirt / deposit blocking armature or diaphragm too stiff.		Clean orifice with needle or similar (max diameter 0.5 mm). Blow clean with compressed air. If necessary, replace defective component(s).
Dirt / deposit in pilot hole.		Clean pilot hole with a pin or needle.

Symptom: Solenoid valve partly opens, low flow	Comment	Check
Differential pressure too low.	Data sheet / store.danfoss.com: Diffential pressure too low for body?	Check valve data, incl. differential pressure. Replace valve with correct version.
Damaged or bent armature tube.		Replace valve.
Dirt at diaphragm / diaphragm damaged.		Clean diaphragm. If necessary, replace defective component(s) .
Armature partly blocked / dirt or deposit in armature tube.		Clean valve. If necessary, replace defective component(s).

Symptom: Solenoid valve does not close/partly closes	Comment	Check
Voltage remains on coil.		First lift coil slightly and note whether it offers resistance against lifting. **NOTE:** Never remove a coil with voltage applied for more than 2 seconds – it may burn out.
Dirt on main orifice, or on pilot orifice, or equalizing orifice in diaphragm, in armature tube or equalizing unit blocked.		Clean orifice with needle or similar (max diameter 0.5 mm). Blow clean with compressed air. If necessary, replace defective component(s).
Pulsation in pressure line. Differential pressure too high in open position. Pressure on outlet side periodically higher than pressure on inlet side.		Check valve data. Check pressure and liquid flow. Check rest of installation. Replace valve with a more suitable alternative.
Damaged or bent armature tube.		Replace valve.
Defective valve plate, diaphragm or valve seat. Dezincification, dirt, deposit or damage on main or pilot orifice.		Check pressure and liquid flow. Replace defective component(s).
Diaphragm upside down.		Check correct installation of valve (see instruction/datasheet).

Symptom: Solenoid valve making noise	Comment	Check
Hum.	Only on AC voltage 50/60 Hz.	Hum caused by AC frequency can be removed by changing to coil with rectifier. Inspect and clean inside armature and armature tube. Can also be dirt or armature or spring worn out / defect (Replace valve or parts).
Water hammer when valve opens. Water hammer when valve closes.		See installation guide. Pipes very long and pipe diameter too small.
Differential pressure too high and / or pulsation in pressure line.		Check valve data. Check pressure and liquid flow. Check for back pressure. Check rest of installation. Replace valve with a more suitable alternative.

Symptom: Coil burnt – melted; coil with voltage on	Comment	Check
Incorrect voltage / frequency.		Check coil data. If necessary, change to correct coil type. Check wiring diagram and wiring. Check maximum voltage variation: Permissible voltage variation: +/- 10% for dual frequency; DC and NO applications +10% / -15% for AC on single frequency voltages.
Differential pressure too high.		Check coil data. If necessary, replace coil with correct version. Reduce differential pressure, e.g. by limiting inlet pressure.
Coil short cut because of humidity, wrong coil IP rating, too high ambient temperature, too high media temp.		Check coil data and differential pressure and ambience temperatures and media and check with coil and valve specifications.
Damaged / bent armature tube.		Replace valve.
Dirt at armature / armature tube / armature stuck.		Clean armature tube and armature. If necessary, replace defective component(s).