



SIL (Safety Integrity Level) and Lambda-values

Pneumatically Actuated Needle Valves: -AT02 and -ATC2

Solenoid Valves: SP and SD

SIL & Lambda-values Nova Swiss Valves

SIL consideration and assessment of the entire system essentially required three main components:

- Actuator(s)
- Sensor(s)
- Control system (logic)

Nova Swiss supplies only the high-pressure valve from the whole actuator system.

The complete boundary conditions and installation are as whole defined by the manufacturer of the system and unknown for Nova Swiss. Therefore only the manufacturer of the system can do the SIL-assessment and SIL-certification.

Nova Swiss can provide so-called failure probabilities (lambda values) needed for the assessment. These values have been determined based on IEC 61508, using Route 2H and FMEDA method.

The lambda-values in below tables are based on following boundary conditions:

- **Dynamic application:** the device moves at least once every 200 hours
- **DTT:** De-Energize-To-Trip
- **SSI 2:** Site Safety Index 2 assumes good maintenance and repair of the system

Lambda-values for Nova Swiss Pneumatic Needle Valves

	λ_{SD}	λ_{SU}	λ_{DD}	λ_{DU}	#	E
NVx-xx-xx-ATO-(ET)	0	95	0	217	786	406
NVx-xx-xx-ATO2-(ET)						
NVx-xx-xx-ATC-(ET)	0	69	0	110	964	406
NVx-xx-xx-ATC2-(ET)						



Lambda-values for Nova Swiss Solenoid Valves

	λ_{SD}	λ_{SU}	λ_{DD}	λ_{DU}	#	E
V1-SPx-14-6M-NC-4	0	30	0	178	263	15
V2-SP7-14-6M-NC-4	0	30	0	178	213	15
V3-SDx-14-4M-NC-4	0	30	0	111	63	14
V4-SPx-14-6M-NO-4	0	30	0	269	277	15
V5-SDx-14-4M-NO-4	0	30	0	202	77	14



Where:

- λ_{SD} = Fail safe detected
- λ_{SU} = Fail safe undetected
- λ_{DD} = Fail dangerous detected
- # = No effect failures
- E = External leaks

Lambda values for static application and for SSI 4 are available on request.