Central processing unit 10002/1/2 and 10012/1/2 (single processor):

System	**single CP - single I/O (1oo1D)**	**redundant CP - single I/O (1oo2D)**	**redundant CP - redundant I/O (1oo2D)**
Safety Integrity Level	SIL 1 - 3	SIL 1 - 2	SIL 1 - 3
Number of central parts	1	2	2
Minimum number of Bus Systems (Note 6) (VBD 10001/x/1)	1	1	2
System response in the event of localisable faults, i.e. internal fault conditions attributable to a central part (Note 5)	System shutdown	SIL 1 - 2: Shutdown of defective central part and continued operation for unlimited period using intact central part. SIL 3: Possible system response: • Shutdown of defective central part and single-channel operation for a period of time defined by the manufacturers PFD calculation for a specific system. (Note 4) System shutdown can be programmed by means of user program.	
System response in the event of I/O comparison errors (non-localisable) Input comparison		In the event of input signals recognised as inconsistent by comparison, the system switches to the safe condition of the affected input and indicates this by a system flag. The fault response "System shutdown, process group shutdown or alarm" shall be programmed. Or if • the process is continuously monitored by an operator AND • the process safety time is sufficiently long to insure manual shutdown AND • the operator has sufficient means to monitor and shutdown the process independent of the FSC system AND • the fault is annunciated by fail-safe means manual reaction and shutdown is permissible.	

System	single CP - single I/O (1oo1D)	redundant CP - single I/O (1oo2D)	redundant CP - redundant I/O (1oo2D)
System response in the event of I/O comparison errors (non-localisable) Output comparison		An output comparison error is indicated by a system flag. The fault response “System shutdown, process group shutdown or alarm” shall be programmed. SIL2: IF • the process is continuously monitored by an operator AND • the process safety time is sufficiently long to insure manual shutdown AND • the operator has sufficient means to monitor and shutdown the process independent of the FSC system AND • the fault is annunciated by fail-safe means manual reaction and shutdown is permissible. SIL3: System shutdown	
System response in the event of failure of fail-safe output modules (localisable fault)	Depending on the locality of the fault, the system responds as follows: • Shutdown of output signal or • Group shutdown or • System shutdown	Depending on the locality of the fault, the system responds as follows: • Shutdown of output signal of the channel concerned or • Group shutdown of the channel concerned • System shutdown	Depending on the locality of the fault, the system responds as follows: • Shutdown of output signal of the channel concerned or • Group shutdown of the channel concerned or • Shutdown of the affected central part • SIL 3: Continued operation for a period of time defined by the manufacturers PFD calculation for a specific system. (Note 4)
	Process group shutdown or system shutdown shall be programmed.	Process group shutdown or system shutdown shall be programmed.	Process group shutdown or system shutdown shall be programmed.

System	single CP - single I/O (1oo1D)	redundant CP - single I/O (1oo2D)	redundant CP - redundant I/O (1oo2D)
System response in the event of failure of fail-safe input modules (localisable faults)	Defective digital inputs are read as “0 signal” and in the case of analogue inputs, the configured minimum limit is adopted. "System shutdown, process group shutdown or alarm” shall be programmed.	Defective digital inputs are read as “0 signal” and in the case of analogue inputs, the configured minimum limit is adopted. The fault response "System shutdown, process group shutdown or alarm shall be programmed OR if • the process is continuously monitored by an operator AND • the process safety time is sufficiently long to insure manual shutdown AND • the operator has sufficient means to monitor and shutdown the process independent of the FSC system AND • the fault is annunciated by fail-safe means manual reaction and shutdown is permissible.	The input signals recognised as defective are overwritten by the correct input signals from the other channel and an error message is generated. The fault response "Process group shutdown or alarm” with continued operation for a period of time defined by the manufacturers PFD calculation for a specific system (Note 4) or "System shutdown" shall be programmed.

Table 6: Central processing unit 10002/1/2 and 10012/1/2 (single processor)

Note 4: Faults in redundant central parts which are detected and localised by the self-tests result in single-central part operation for a limited time period. The mode of operation; single or redundant does not influence the coverage of the self-tests. The self-test interval is not extended for single-central part operation. The self-test interval shall be less than the fault tolerance period of the process (PST).
The fail-to-danger-rate of an application including sensors and positioners at the controller’s ascertained MTBF figures and fault coverage rates are not significantly increased by single-channel operation for a limited period. This period has to be defined by the manufacturers PFD calculation for a specific system
The calculated maximum duration for single-central part operation depends on the specific process concerned and must be specified individually for each application. On the FSC system, this is specified by means of the system parameter "Interval time between faults".

Note 5: SIL 1- 2: All faults which are only detected by comparing the internal system statuses of the two central parts and cannot be localised result in a system alarm

SIL 3: For central parts and output failures all faults which are only detected by comparing the internal system statuses of the two central parts and cannot be localised result in immediate shutdown of the system.

Note 6: Multiple VBD Bus systems may be used for expansion and I/O segregation.