

Overview of the requirements for reserves

Remedial action	Frequency containment reserves			Frequency restoration reserves	
FFR	FCR-D upward	FCR-D downward	FCR-N	aFRR	mFRR
Fast Frequency Reserve (Snabb frekvensreserv)	Upward Frequency Containment Reserve - Disturbance (Frekvenshållningsreserv -Störning uppreglering)	Downward Frequency Containment Reserve - Disturbance (Frekvenshållningsreserv -Störning nedreglering)	Frequency Containment Reserve - Normal (Frekvenshållningsreserv -Normaldrift)	Automatic Frequency Restoration Reserve (Automatisk Frekvens-återställningsreserv)	Manual Frequency Restoration Reserve (Manuell Frekvens-återställningsreserv)
Upward regulation	Upward regulation	Downward regulation	Symmetrical upward and downward regulation	Upward and/or downward regulation	Upward and/or downward regulation
Minimum bid size 0,1 MW	Minimum bid size 0,1 MW	Minimum bid size 0,1 MW	Minimum bid size 0,1 MW	Minimum bid size 1 MW	Minimum bid size Capacity market: 1MW** Energy activation market: 5MW
Activation Automatic activation for changes in frequency when there are low levels of rotational energy in the system	Activation Automatic linear activation within the frequency interval 49,90 - 49,50 Hz	Activation Automatic linear activation within the frequency interval 50,10 - 50,50 Hz	Activation Automatic linear activation within the frequency interval 49,90 - 50,10 Hz	Activation Automatic activation for frequency deviations from 50,00 Hz	Activation Manual activation when requested by Svenska kraftnät
Activation time Three alternatives for 100%: - 0,7 seconds (at 49,50 Hz) - 1,0 seconds (at 49,60 Hz) - 1,3 seconds (at 49,70 Hz)	Activation time Activation time for FCR-D up is presented in the document with technical requirements for frequency containment reserves (FCR) See requirement 2 on page 18	Activation time Activation time for FCR-D down is presented in the document with technical requirements for frequency containment reserves (FCR) See requirement 2 on page 18	Activation time Activation time for FCR-N is presented in the document with technical requirements for frequency containment reserves (FCR) See requirement 1 on page 14 as well as requirement 9 on page 28	Activation time 100 % within 5 minutes	Activation time 100% within 15 minutes
Volume requirements for Sweden Up to about 100 MW	Volume requirements for Sweden Up to 567 MW	Volume requirements for Sweden Up to 547 MW*	Volume requirements for Sweden 235 MW	Volume requirements for Sweden Up to 111 MW	Volume requirements for Sweden Capacity market: Up to 300 MW Energy activation market: No volume requirement
Endurance - Endurance: 30 seconds alternatively 5 seconds - Repeatability: Ready for activation within 15 minutes	Endurance Endurance: At least 20 minutes	Endurance Endurance: At least 20 minutes	Endurance Endurance: 1 hour	Endurance Endurance: 1 hour	Endurance Endurance: 1 hour

* Actual plan for procurement is lower than the volume requirement since FCR-D downward is a new product that was introduced in January 2022. The procurement plan is updated quarterly. More information is available in Swedish on Svenska kraftnät's webpage: www.svk.se/aktorsportalen/bidra-med-reserver/behov-av-reserver-nu-och-i-framtiden/

** A cleared bid on the capacity market implies a commitment to submit a bid on the energy market.

More detailed information on the requirements is available in Swedish in the balance responsibility agreement and associated regulatory documents. They are available for download on Svenska kraftnät's webpage: www.svk.se/aktorsportalen/balansansvarig/balansansvarsavtalet/