

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 0,5 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: 1 MW* Energy activation market: 1 MW
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 Automatic activation based on forecasted imbalances for each bidding zone area
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)	Activation time Activation time for FCR-D down is presented in the document with technical requirements for frequency containment reserves (FCR)	Activation time Activation time for FCR-N is presented in the document with technical requirements for frequency containment reserves (FCR)	Activation time 100 % within 5 minutes	Activation time Full activation time of 12,5 minutes, with a preparation time of 2,5 min and a 10-minute ramping period
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: 15 minutes for scheduled activation and 30 minutes for direct activation

* 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 BSP agreement and associated regulatory documents. They are available for download on Svenska kraftnät's website: www.svk.se/aktorsportalen/leverantor-av-balanstjanster-bsp/bsp-avtalet/

Information about volume requirements is published in Swedish on Svenska kraftnät's website: <https://www.svk.se/aktorsportalen/bidra-med-reserver/behov-av-reserver-nu-och-i-framtiden/>