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In this paper, the modular-type operator norm of the general geometric mean operator is investigated. We give two applications of a new limit process, introduced by the present authors, to the establishment of Pólya-Knopp-type inequalities over spherical cones. Our results not only generalize Persson-Stepanov's and Wedestig's results, but also provide new proofs of these results. (Received January 06, 2015)