The proposed device for controlling vortex structures (5) in a turbulent air jet (3) flowing out of the air exhaust channel, which is constituted by at least one pair of needles (1) connected to an AC voltage source to create a pulsating corona discharge between the needles. One needle is located along and the other across the flow to produce a resonant effect of the pulsating corona discharge on the vortex structures. In the proposed method for controlling vortex structures in a turbulent air jet, at least one pair of needles connected to an AC voltage source to create a pulsating corona discharge between the needles. One needle is located along and the other across the flow to produce a resonant effect of the pulsating corona discharge on the vortex structures.