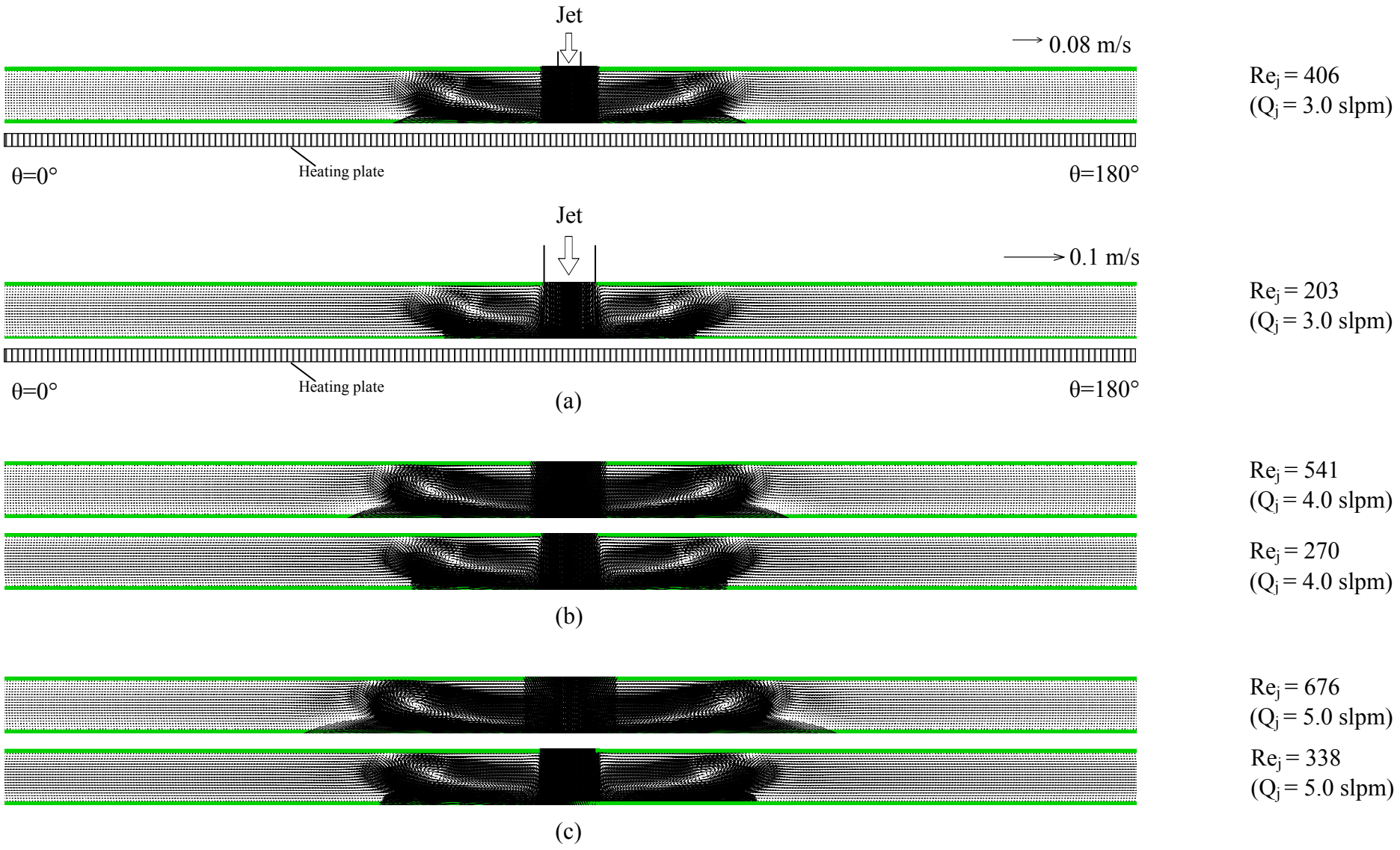

Re_j = 406
(Q_j = 3.0 slpm)

Re_j = 203
(Q_j = 3.0 slpm)

Re_j = 541
(Q_j = 4.0 slpm)

Re_j = 270
(Q_j = 4.0 slpm)

Re_j = 676
(Q_j = 5.0 slpm)

Re_j = 338
(Q_j = 5.0 slpm)

Fig. 4.8 Velocity vectors on the cross plane θ= 0° & 180° at steady state for H = 20.0 mm with D_j = 10.0 & 20.0 mm at Ra = 0 (ΔT = 0℃) for Re_j = (a) 406 and 203 (Q_j = 3.0 slpm), (b) 541 and 270 (Q_j = 4.0 slpm), and (c) 676 and 338 (Q_j = 5.0 slpm).

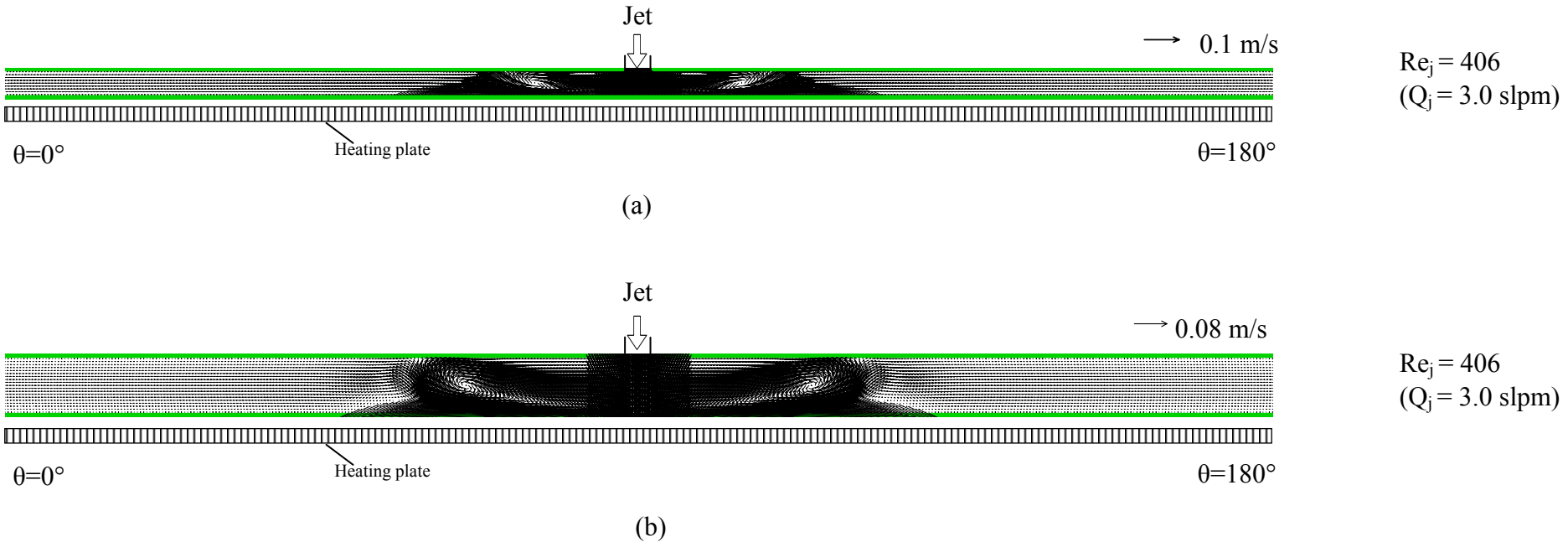

Fig. 4.9 Velocity vectors on the cross plane θ= 0° & 180° at steady state for D_j = 10.0 mm, Re_j = 676 (Q_j = 5.0 slpm) at Ra = 0 (ΔT = 0℃) for H = (a) 10.0 mm and (b) 20.0 mm.

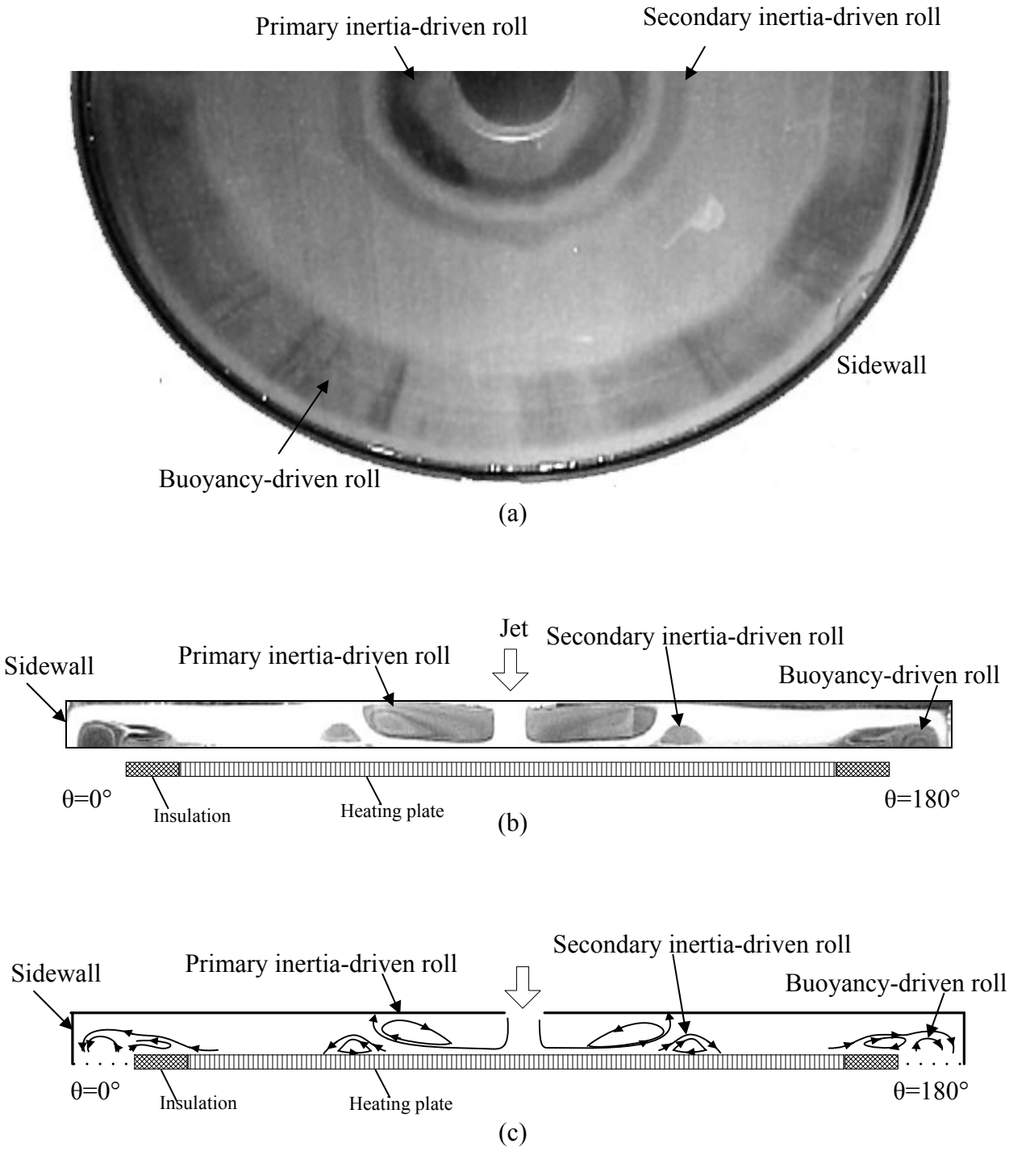

Fig. 4.10 Steady vortex flow pattern for D_j=10.0 mm and H=15.0 mm at Re_j=406 (Q_j=3.0 slpm) and Ra=3,170 (ΔT=10.0℃): (a) top view flow photo taken at the middle horizontal plane between the disk and chamber top, (b) side view flow photo taken at the vertical plane θ=0° & 180° and (c) the corresponding schematically sketched cross plane vortex flow.

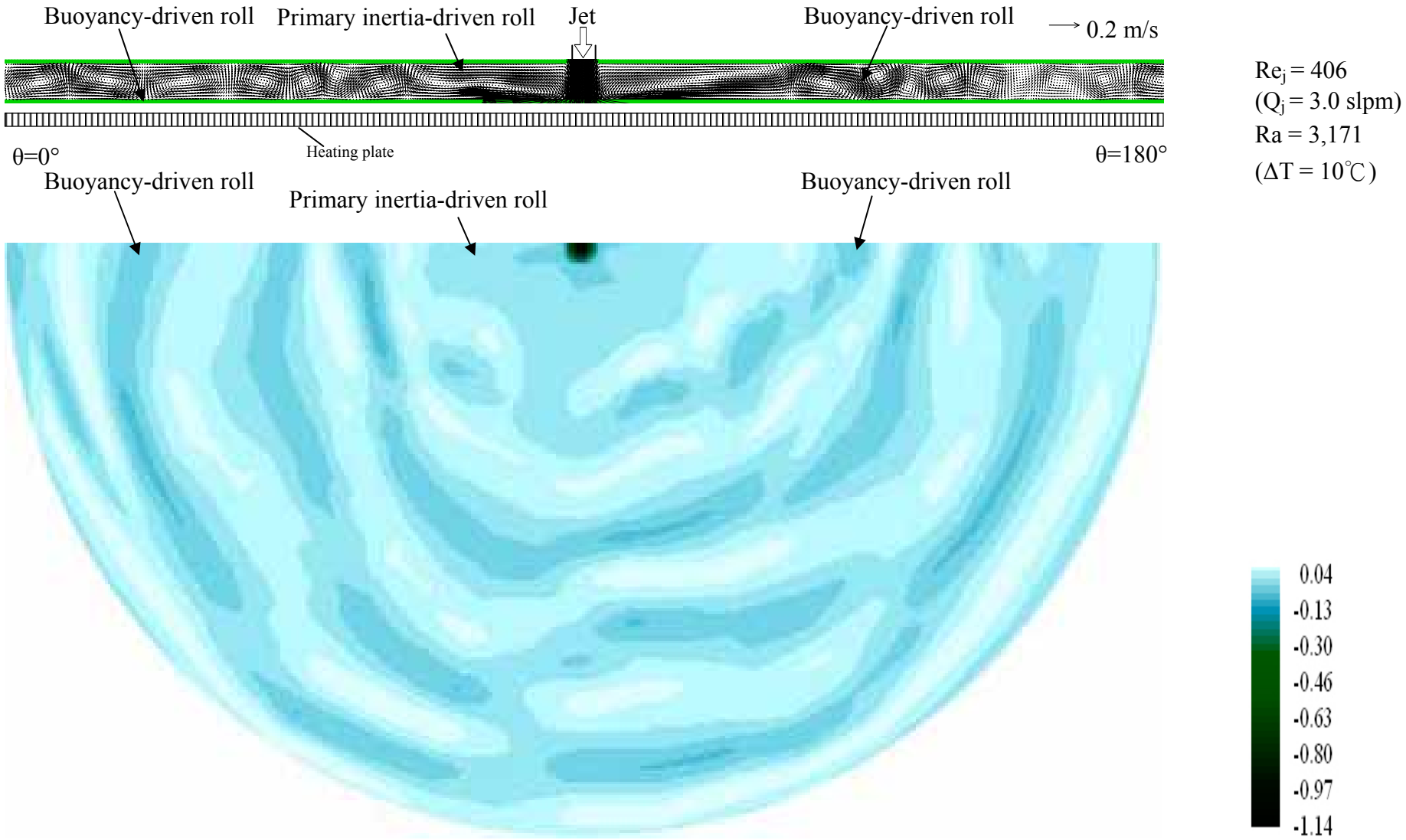

Fig. 4.11 Unsteady vortex flow at certain instant in statistical state for H = 15.0 mm, and Ra = 3,171 (ΔT = 10℃) at Re$_j$ = 406 (Q$_j$ = 3.0 slpm): (a) velocity vectors on the vertical plane θ= 0° & 180° and (b) contours of the vertical velocity component w at the horizontal plane z = -7.5 mm.

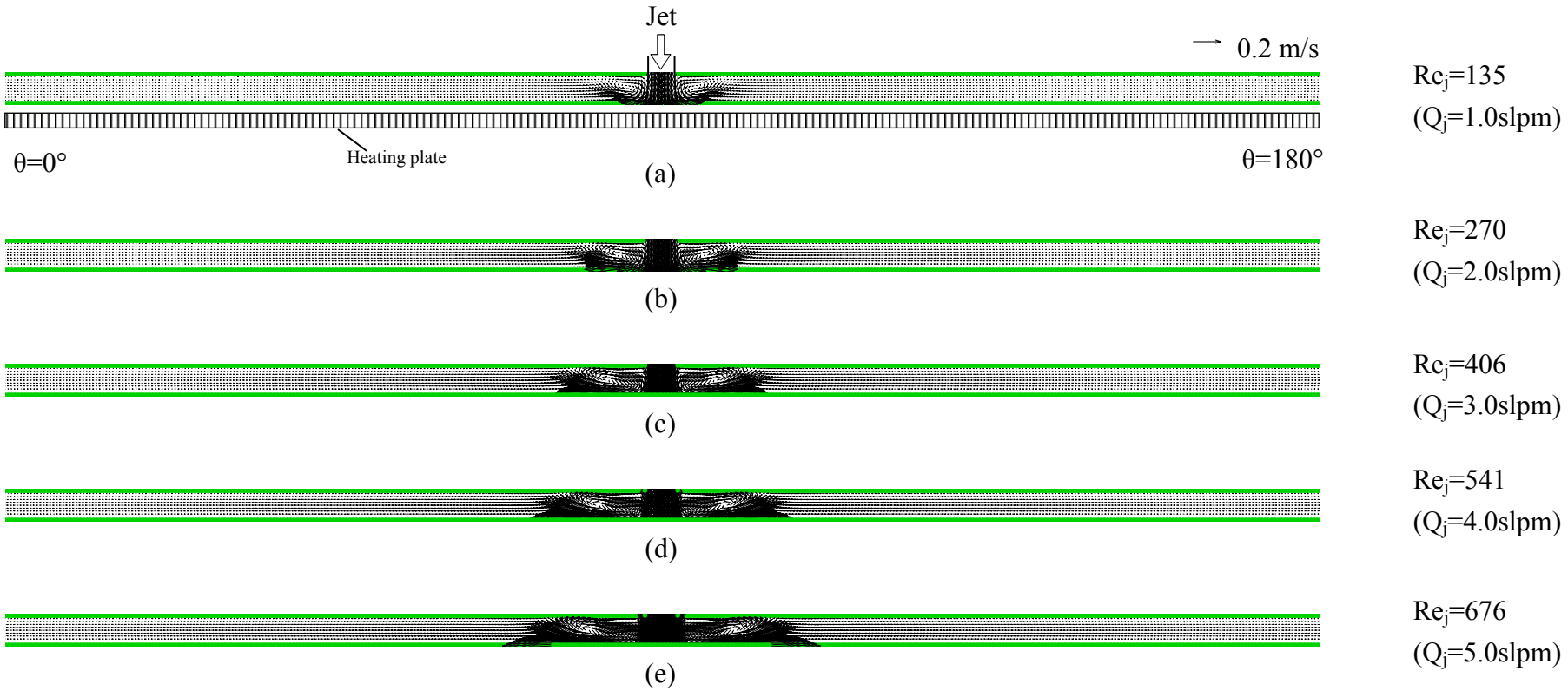

Fig. 4.12 Velocity vectors on the cross plane θ = 0° & 180° at steady state for D_j = 10.0 mm, H = 10.0 mm, Ra = 470 (ΔT = 5℃) for Re_j = (a) 135 (Q_j=1.0 slpm), (b) 270 (Q_j=2.0 slpm), (c) 406 (Q_j=3.0 slpm), (d) 541 (Q_j=4.0 slpm), and (e) 676 (Q_j=5.0 slpm).