we have $i^{p-q}\,(-1)^{(n-k)(n-k-1)/2} = i.$ and

$$Q(\xi, \bar{\xi}) = i\int_M |h(z)|^2\, dz\wedge d\bar{z} > 0.$$

$\ulcorner$ ① $dz\wedge d\bar{z} = (dx+idy)(dx-idy) = idy\wedge x - idx\wedge dy$
$= -2i\,dx\wedge y.$

$i^{p-q}\,(-1)^{(n-k)(n-k-1)/2} = i$. No problem with both $n-k=p+q$
$k = p+q$.

$n=1$, $p=1$. $q=0$.

In general, for M of any dimension, $H^{p,0}(M)$ and $H^{0,p}(M)$ are primitive by consideration of type, and the same calculation works to verify the bilinear relations for them.

$\ulcorner$ $P^{p,0}(M) = H^{p,0}(M)$? If $\sigma\in H^{p,0}(M)$, then $\Lambda\sigma\in A^{p-1,-1} = 0 \Rightarrow \Lambda\sigma = 0 \Rightarrow \ker\Lambda \supset H^{p,0}(M)$.
Similarly, $\ker\Lambda\supset H^{0,p}(M) = \overline{H^{p,0}}(M)$ (Λ is real)

Let $\xi = f_I\varphi_I \in H^{p,0}(M)$, f_I. C^∞. $\varphi_I = \varphi_{i_1}\wedge\cdots\wedge\varphi_{i_p}$.
where $\{\varphi_i\}$ unitary coframe for T^*M.

$$\Rightarrow\ \omega^{n-p} = \left(\tfrac{i}{2}\sum\varphi_i\wedge\bar{\varphi}_i\right)^{n-p} = C\left(\tfrac{i}{2}\right)^{n-p}\sum_{i_1<\cdots<i_{n-p}}\varphi_{i_1}\wedge\bar{\varphi}_{i_1}\wedge\varphi_{i_2}\wedge\bar{\varphi}_{i_2}\wedge\cdots\wedge$$

$$\cdots\wedge\varphi_{i_{n-p}}\wedge\bar{\varphi}_{i_{n-p}} = C\left(\tfrac{i}{2}\right)^{n-p}\sum\varphi_{i_1}\wedge\varphi_{i_2}\wedge\cdots\wedge\varphi_{i_{n-p}}\wedge\bar{\varphi}_{i_1}\wedge\cdots\wedge\bar{\varphi}_{i_{n-p}}$$

$$\times\,(-1)^{1+2+\cdots+(n-p-1)} = C\left(\tfrac{i}{2}\right)^{n-p}(-1)^{\frac{(n-p-1)(n-p)}{2}}\sum_{\#K=n-p}\varphi_K\wedge\bar{\varphi}_K, \quad C>0$$

$$\Rightarrow\ \xi\wedge\bar{\xi}\wedge\omega^{n-p} = C\sum f_I\varphi_I\wedge\sum\bar{f}_I\bar{\varphi}_I\wedge\left(\tfrac{i}{2}\right)^{n-p}(-1)^{\frac{(n-p)(n-p-1)}{2}}\sum_{\#K=n-p}\varphi_K\wedge\bar{\varphi}_K$$

$$= C\left(\tfrac{i}{2}\right)^{n-p}(-1)^{\frac{(n-p)(n-p-1)}{2}}\sum|f_I|^2\varphi_I\wedge\bar{\varphi}_I\wedge\varphi_K\wedge\bar{\varphi}_K$$

$$= C\left(\tfrac{i}{2}\right)^{n-p}(-1)^{\frac{(n-p)(n-p-1)}{2}}(-1)^{(n-p)p}\sum|f_I|^2\varphi_I\wedge\varphi_K\wedge\bar{\varphi}_I\wedge\bar{\varphi}_K$$