Parabolic integro-differential model Cauchy problem is considered in the scale of $L^p$-spaces of functions whose regularity is defined by a scalable Lévy measure. Existence and uniqueness of a solution is proved by deriving apriori estimates. Some rough probability density function estimates of the associated Lévy process are used as well. Precisely we consider the following equation with $\lambda \geq 0$

$$
\begin{align*}
\partial_t u(t,x) &= Lu(t,x) - \lambda u(t,x) + f(t,x) + \int_U \Phi(t,x,\nu) q(\,dt,\,d\nu), \\
u(0,x) &= g(x) \text{ in } E = [0,T] \times \mathbb{R}^d
\end{align*}
$$

where an integro-differential operator with Lévy measure $\pi$ is defined by

$$
L\varphi(x) = L^\pi \varphi(x) = \int \left[ \varphi(x+y) - \varphi(x) - \chi_\sigma(\nu) \cdot \nabla \varphi(x) \right] \pi(dy), \varphi \in C^\infty_0(\mathbb{R}^d),
$$

and $q(\,dt,\,d\nu)$ is a compensated point measure. (Received September 23, 2017)