The very diverse population of inhibitory interneurons plays a fundamental role in shaping cortical activity. Vasoactive intestinal polypeptide (VIP) expressing interneurons have received attention as integrators of long-range input into the local cortical network. Creating a cell type specific wiring diagram would contribute to a better understanding of the circuitry of these neurons and hence their function. Retrograde rabies virus tracing is perfectly suited to study the monosynaptic inputs to a genetically defined cell type. I used this method to label the brain wide afferent connectome of VIP neurons in the mouse barrel cortex. In addition, I used intrinsic signal optical imaging to guide the injection and increase the spatial specificity of viral infection, in order to obtain a coherent experimental sample. More than 90 % of cells presynaptic to VIP neurons were found within the barrel cortex. Other reliably labeled cortical areas included ipsilateral primary (outside of whisker representation) and secondary somatosensory, visual, auditory, motor and cingulate cortex as well as contralateral barrel cortex. Subcortical projections originated from several thalamic nuclei, especially the ventral posteromedial nucleus, and from the basal forebrain. Finally, identification and counting of all presynaptic cells and all VIP starter neurons, from which rabies virus had spread, in one brain, revealed an average number of about 20 cells projecting to one VIP neuron. This low number indicates that some presynaptic cells might escape rabies virus tracing. This work strengthens the concept of VIP neurons as integrators and long-range input. The visualization of cell type specific anatomical circuits could serve as a framework for future physiological studies.