



Vertical Moving Robot (V-Move)

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“V-Move” has 2 major components: crane and robot platform. The crane is installed on the top of building to support the robot and to control the vertical and horizontal movement of the robot. The system of ‘V-Move’ is shown in figure 1.

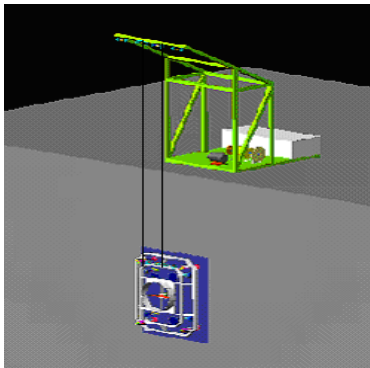


Figure1: Graphical simulation of Vertical moving robot (V-Move)

Mechanism of robot platform can be explained as follows. The driving system comprises of 2 sets of wheels (4 wheels/set). The first set is the driving wheel that allows the robot to move horizontally on the building surface. The second set, without motor, provides support when the robot moves in vertical direction. The robot can change direction from horizontal to vertical by switching between two sets of wheels using the pneumatic cylinder.

The suction mechanism comprises of 4 suction cups attached directly to 4 pneumatic cylinder. This mechanism is used for holding the robot in stable position on the vertical plane of the building.

It prevents the robot from slipping when external force (i.e. caused by wind or other forces) is acting on the robot.

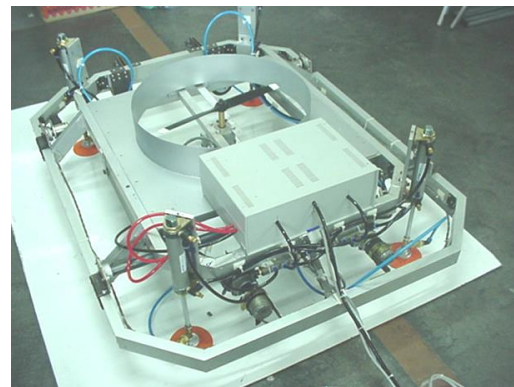


Figure 2: Vertical moving Robot (V-Move)

Translational movement in vertical plane requires perpendicular force to create the vertical friction force. Hence, a blower is designed to generate sufficient perpendicular force to the robot in order to keep it attaches perfectly to the plane.

From preliminary experiment at ‘FIBO’ building, the blower can make sufficient perpendicular force such that ‘V-Move’ robot can move smoothly in vertical and horizontal plane with velocity of 0.3 m/s.