

## ROBOT 90

### A unique solution for sludge removal

#### Traditional technologies

Sludge is usually sediment in square or round basins and is lifted by a pump. Since the area of the basin use to be several square meters, the sludge must be moved to the pump. Often it is done by different scrapes. Scrapes are usually big machines, which are expensive in purchasing and need lot of energy. When troubles occur the basin must be usually emptied for reparation of the scrape.

If the sedimentation basin is not big, the bottom is formed as a cone and the sediment sludge slides down to the bottom of the cone wherefrom the sludge is pumped.

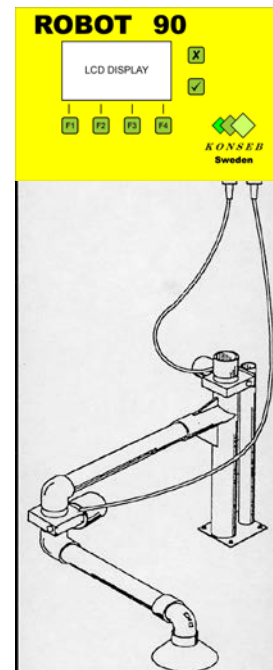
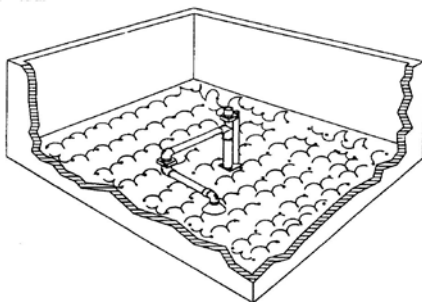
This type of basin is difficult and expensive to build.

#### The unique ROBOT 90

The ROBOT 90 Sludge Removal System consists of a suction cone on an articulated pipe arm, which extends from a vertical stand fixed in a suitable place of the sedimentation basin. The cone and the pipe are connected to an external pump and the sludge is sucked up from the basin's bottom to an external container for further treatment, such as thickening or dewatering.

The system is designed to operate completely immersed in water while the sedimentation basin is in use. The settling process is not disturbed by the gentle action of ROBOT 90 and the sludge is not stirred up.

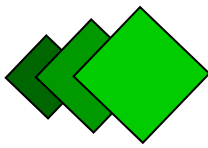
ROBOT 90 performs equally well in round, rectangular or irregularly shaped tanks. If there is an obstacle e.g. a pole arms go around it. A programmable control unit controls the movement of the arms. The cone sweeps over the bottom of the basin and stops at a number of programmed points for a certain time to pump out the sludge.



The sweep pattern can be programmed to work around obstacles, protruding pipes etc. ROBOT 90 can remove sludge from behind obstacles or around corners. The number of pause points, the duration of each stop and the time between each sweep can be programmed.

The installation of ROBOT 90 is very simple. The vertical post is anchored to the bottom of the basin with four bolts. Other fixing methods are possible, e.g. similarly to how submersible pumps are mounted.

The arm length is up to 6 m and covers basins up to 8,5x8,5 m. For bigger basins, two or three units can be installed in series or one ROBOT 90 can be moved between different parts of the basin.



## Technical specifications

Weight	below 40 kg
Arm length	up to 6 m
Pipe diameter	90 mm (different in special applications)
Power	0,1 kW, 24 V (DC)

## Pump choice

The pump choice depends on kind and amount of sludge. No pump is needed when hydrostatic pressure can be applied for sludge discharge.

## Applications

The flexibility makes ROBOT 90 well suited for collection of any kind of sludge, organic and inorganic. ROBOT 90 can be applied in water works, wastewater plants, fish farms and industries (paper-mills, breweries, sugar-mills, paint industries etc.). Wherever sludge is sediment ROBOT 90 can be used.

ROBOT 90 is heavy-duty equipment so it can be used on the bottom of lamella separators.

## Flexibility

There are very different types of sludge e.g. thick, thin, viscose, fluffy, organic or inorganic. Special suction pattern is necessary in many cases. Stop points, program length and frequency are some parameters which controls effective sludge removal.

In order to expand the flexibility, drive units with different speed have been developed recently. It makes ROBOT 90 still more effective when collecting “difficult” sludge as extra thick or extra fluffy.

## Special applications

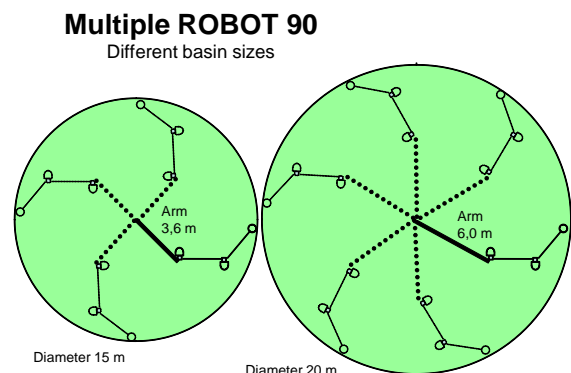
ROBOT 90 can be adapted for basins with slight slope, up to 15°.

ROBOT 90 can be used for collecting of surface sludge.

ROBOT 90 can be used for periodical cleaning of the bottom in combination with DAF (Dissolved Air Flotation). When applying flotation a little part of sludge sediments instead of lifting to the surface. ROBOT 90 collects the “missed” sludge without necessity of emptying the basin.

For bigger basins there are several solutions possible e.g. more than one ROBOT 90 can be used, one ROBOT 90 can be moved between different sections of the basin or a Multiple ROBOT 90 can be used (see the sketch to the right).

When many basins must be cleaned periodically just one ROBOT 90 can be used because it is possible to arrange easy way of moving ROBOT 90 between different basins.



If ROBOT 90 cannot be used (e.g. too big basin, heavy sludge) KONSEB can solve the problem by recommending other products (contact KONSEB for details).