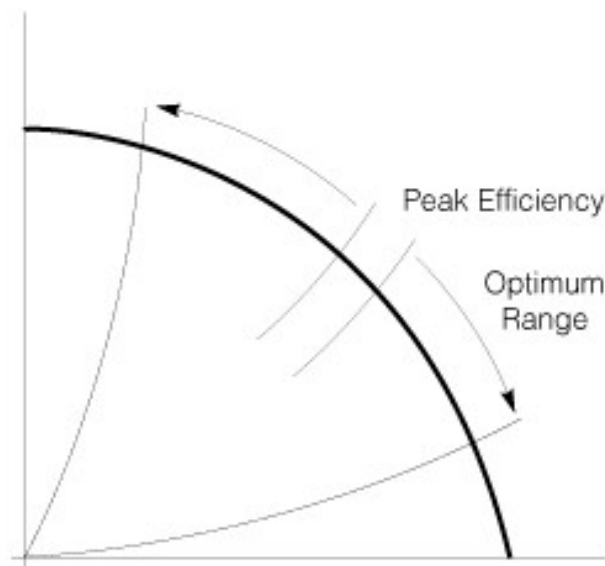


## Backward Curved Centrifugal Application

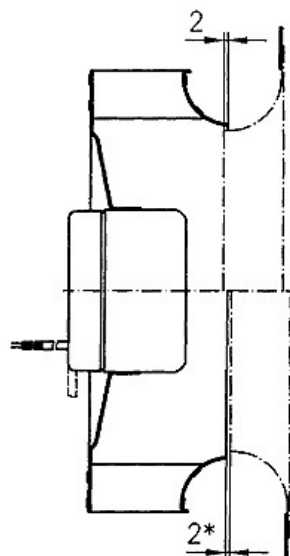
Backward curved centrifugal impellers can be used with or without a scroll. Used without a scroll can be of great benefit as it gives a 360° outlet condition and turns the air through 90°. The use of a scroll, or a half scroll can enhance the performance slightly.

The optimum operation point is generally half way up the air curve, the recommended operation point either side of this area. A backward curved centrifugal has a non-overloading characteristic so it will not overload the motor by operating the impeller in an unstable area.



*A typical backward curve centrifugal fan curve*

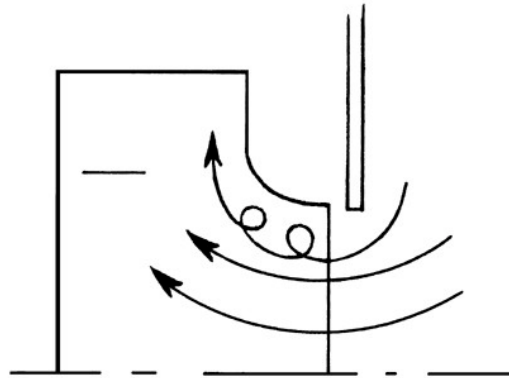
### Key components



*sketch of backward curve fan showing inlet ring*

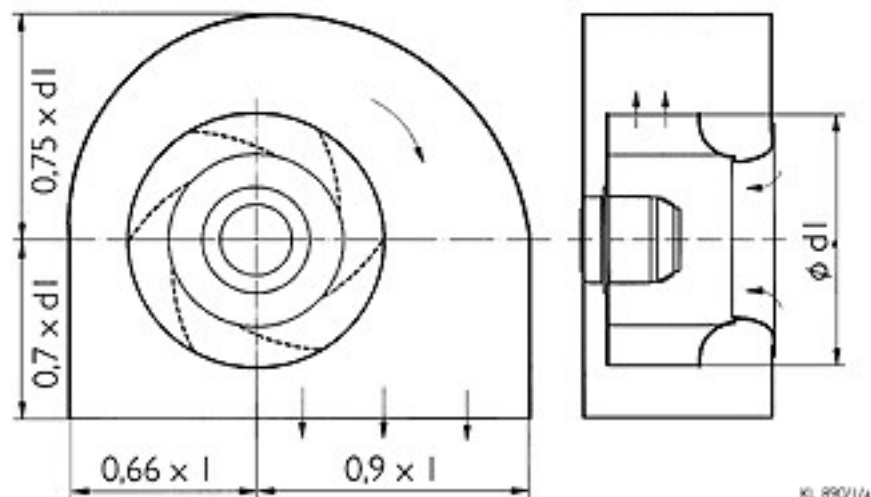
The impeller has a separate inlet ring. To obtain the best performance an inlet ring must be used and also installed in the correct manner. Refer to the catalogue for correct position of the inlet ring. The inlet ring provides a smooth air path on to the impeller. The use of a backward curved without an inlet ring will reduce the performance.

The additional turbulence by not using an inlet ring could reduce performance by 6%. Even when using just a plain round hole is important to make sure the hole in the plate matches with the eye of the impeller, otherwise air will re-circulate round from the pressure side to the suction side causing more turbulence.



*A backward curved without an inlet ring showing increased turbulence*

Half scrolls are sometimes used with backward curved impellers. They help guide the air in one direction. To obtain the best aerodynamic conditions follow the dimensions shown below. A classic mistake is to position the impeller in the centre of the half scroll, but the impeller should be positioned to one side with respect to the rotation of the impeller.



*A backward curved in a half scroll housing*