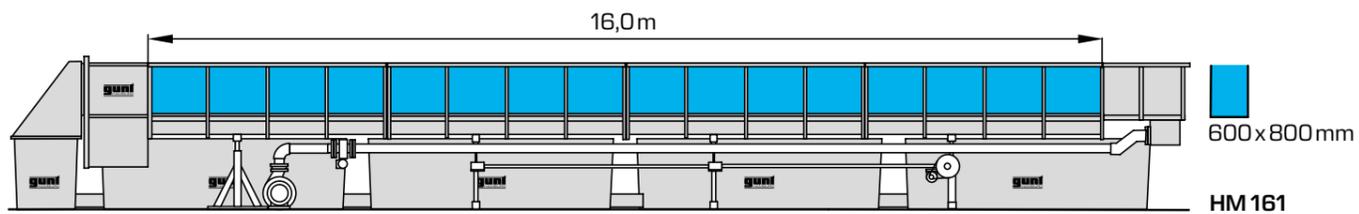
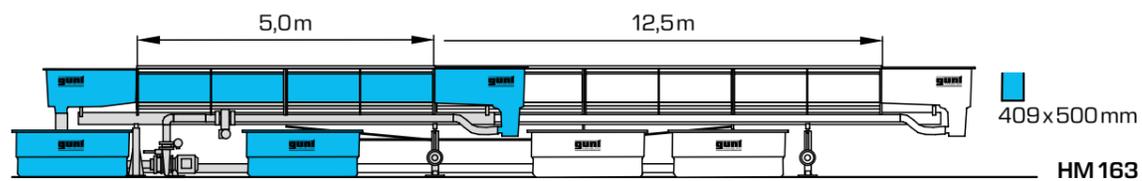
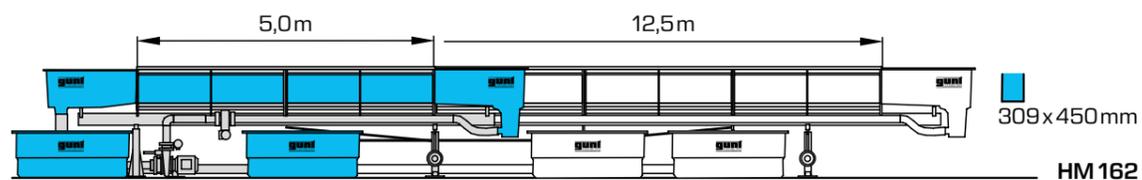
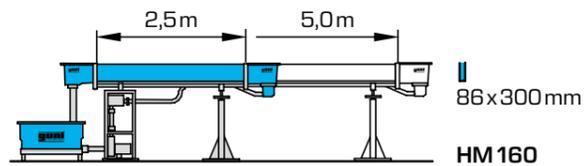


## An overview of GUNT experimental flumes

GUNT experimental flumes and their accessories open up a wide range of experiments and demonstrations on the topics of open-channel flow, running waters, hydraulic engineering and coastal protection. They form the expandable foundation for custom investigations and research work. Experimental flumes from GUNT have been successfully put to use around the world for many years.

For each of the experimental flumes, there is a variety of models for discharge control, such as weirs, sills, stilling basins, as well as wave generators, beach elements and bridge piers. Technical solutions for sediment feed and removal are also available.

In addition, we can also provide specially adapted instrumentation such as water level gauges, pitotstatic tubes, tube manometers and velocity meters.



GUNT provides four experimental flumes with different cross-sections, depending on the purpose of use and the local conditions:

- HM 160 (86x300mm)
- HM 162 (309x450mm)
- HM 163 (409x500mm)
- HM 161 (600x800mm)

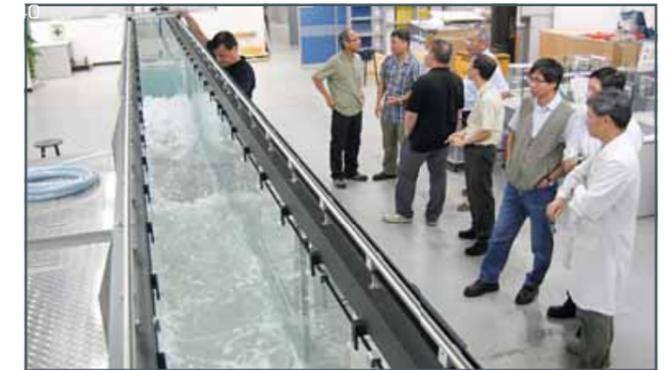
The experimental flumes have different lengths of experimental section to choose from:

- HM 160 with experimental sections of 2,5m or 5m
- HM 162 and HM 163 with experimental sections of 5m, 7,5m, 10m or 12,5m
- HM 161 with an experimental section of 16m

As a result, the length of the experimental section can be adjusted to the individual requirements of the laboratory.



The HM 160 flume is perfectly suited as an introduction to the topic of open-channel flow and the demonstration of many of the basic principles. This flume is compact and required little space.



The HM 162 and HM 163 experimental flumes can be supplied in four different lengths. The "short" experimental flume, with an experimental section of 5m, can easily be set up even in smaller laboratories. As the length of the experimental section increases, the observation section upstream and downstream of obstacles increases.



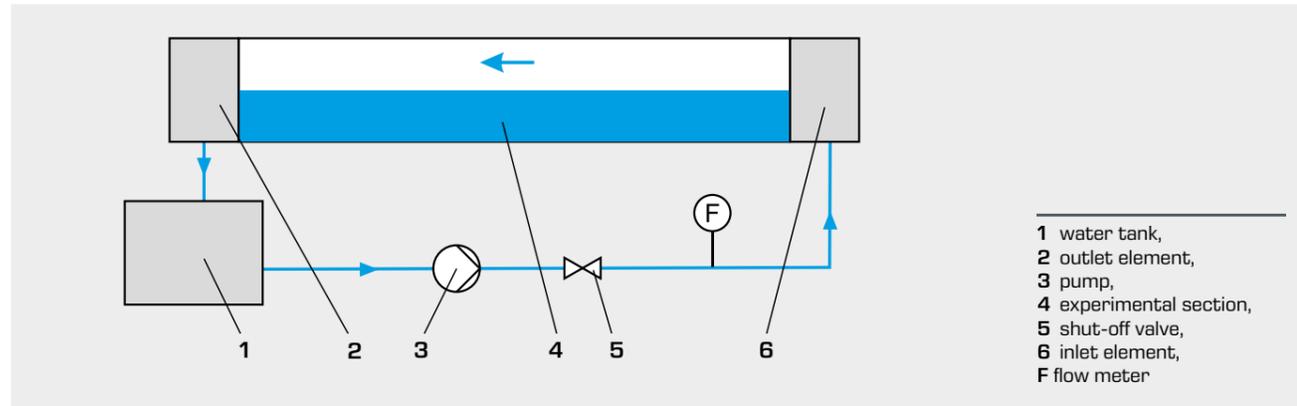
The largest GUNT experimental flume HM 161 – with a cross-section of 600x800mm and a 16m long experimental section – offers a large number of possibilities for your own research projects.



# Technical details for GUNT experimental flumes

## The closed water circuit

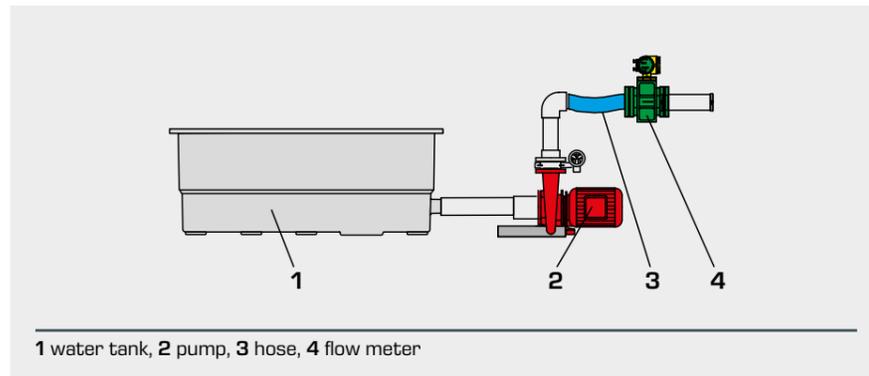
### The water circuit



All experimental flumes can be operated independently of the laboratory water supply and have a closed water circuit with water tanks, pump and flow meter. To protect against over-

filling of the experimental section, level switches turn off the pump when the maximum level in the inlet or outlet element is exceeded.

### The pump



The centrifugal pump is separated from the experimental section in the experimental flumes HM 162, HM 163 and HM 161 and is mounted on its own foundation. It is connected to the piping to the inlet element via a hose. This ensures that there is no transmission of vibrations between the experimental section and the pump. In the small experimental flume HM 160 the vibrations that occur are negligible, so the pump is integrated in one of the experimental flume's supports.



Pump (HM 162) with shut-off valve with manual actuation in the delivery side for adjusting the flow rate (above the pump). The pump's delivery line also contains the hose and the electromagnetic flow meter. The shut-off valve is only needed for wave experiments.

### Methods for adjusting the flow rate in the inlet to the experimental section

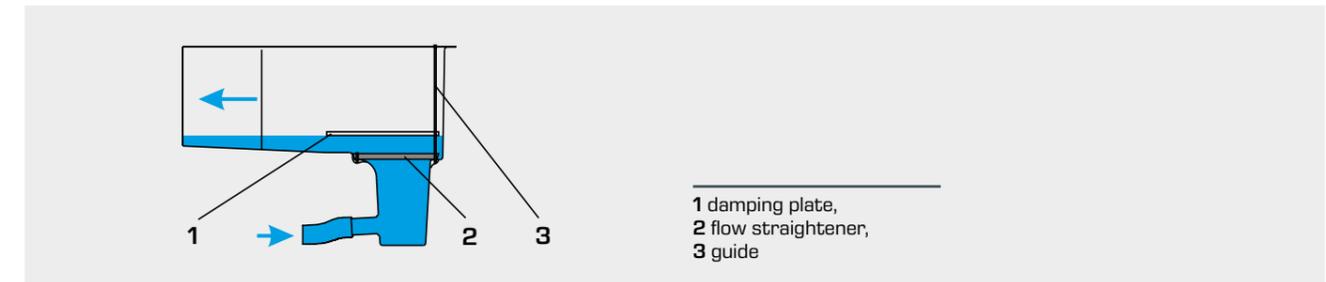
All experimental flumes allow adjusting the flow rate. The speed of the pump used in HM 161, HM 162 and HM 163 is infinitely adjustable by using a frequency converter until the desired flow rate is achieved. In HM 160, a valve is used to adjust the flow

rate. The flow rate in HM 160 is measured by a rotameter, while HM 161, HM 162 and HM 163 are both equipped with an electromagnetic flow meter.

### The inlet element

In all experimental flumes, the inlet element is designed for optimum flow so that the flow is less turbulent as it enters the experimental section.

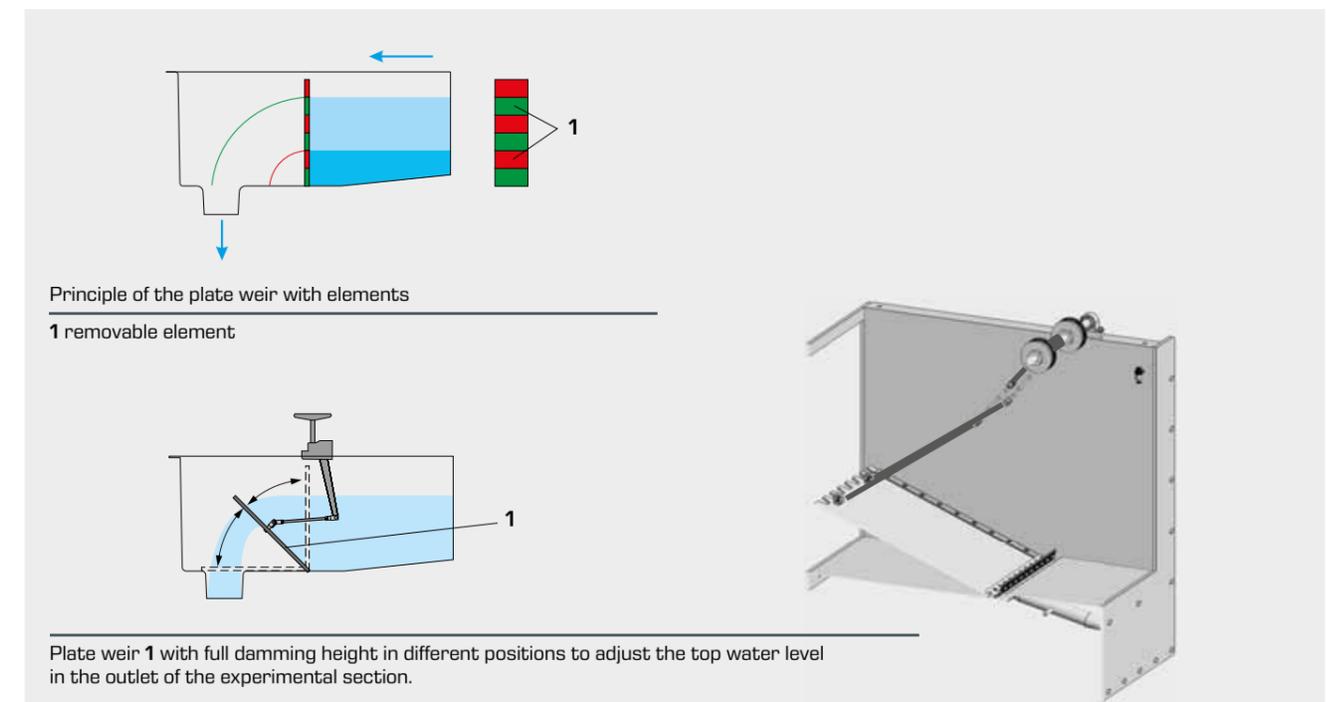
The water enters from below through a flow straightener. A damping plate calms the water further. The damping plate floats on the water and is mounted on a guide.



### The outlet element

The outlet element of all experimental flumes contains a plate weir. The plate weir included in HM 160 consists of six elements that can be removed, so that six damming heights are available to choose from. If all elements are removed, it corresponds to

free discharge without a weir. The plate weir included in HM 161, HM 162 and HM 163 is mounted to rotate around a fixed point and can thus be lowered completely. As such, any desired top water level can be set (see illustrations).



# Technical details for GUNT experimental flumes

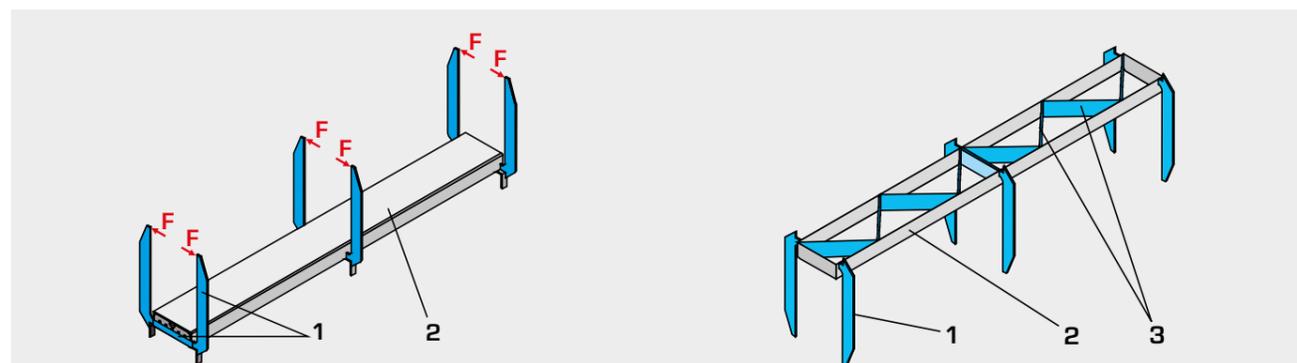
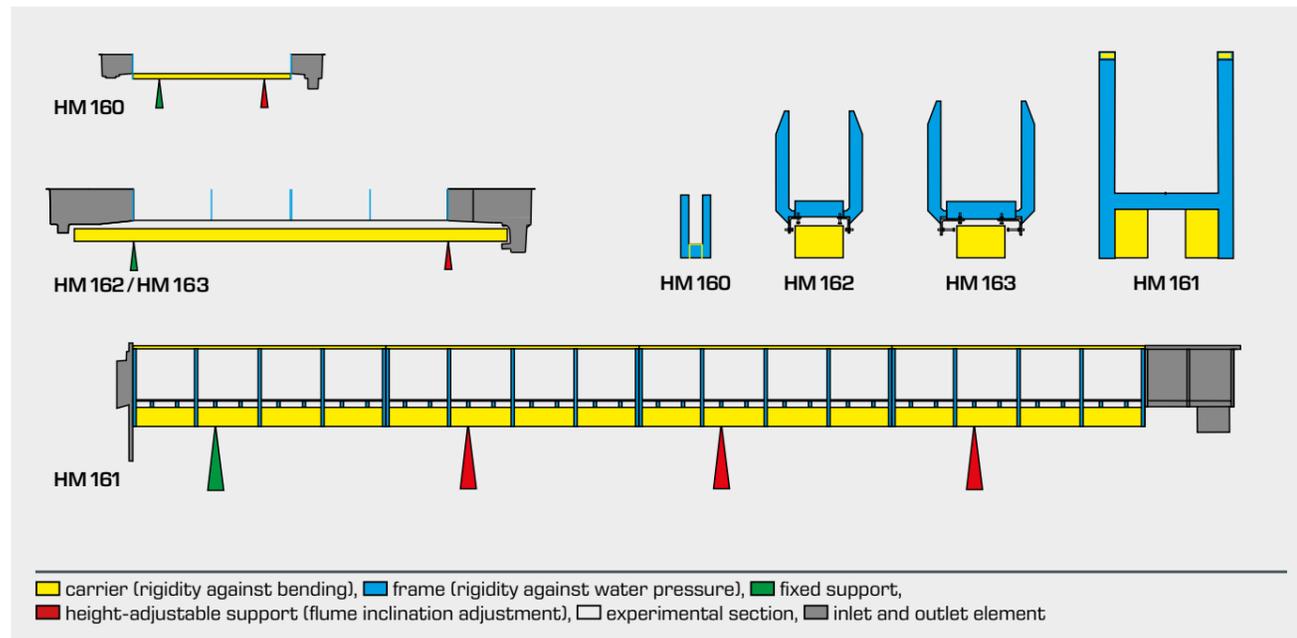
## Structural features

### Rigidity against deformation

The experimental section of HM 162 and HM 163 is available in several lengths. The components used are essentially the same (modular design). In order to realise different lengths with the modular design, while maintaining inclination adjustment, the experimental flume is supported by an auxiliary carrier with two supports. In the version with long experimental section, the inevitable deformations are absorbed by the supports. The individual adjustability of the elements enables precise alignment of the experimental section.

The elements of the self-supporting experimental section in HM 161 are mounted on four supports, so that there is only ever a minimal deformation.

In HM 160 the stresses that occur in comparison to HM 162 are small, so that doubling the length of the experimental section does not pose a problem for the rigidity of the self-supporting experimental flume with two supports.



The rigidity of the elements of the experimental section against water pressure is ensured by the welded frame. The frames support the glass side walls.

Bottom element of an element of the HM 162/HM 163 experimental section, reinforced with diagonal ribs to increase stiffness against bending and torsion.

1 welded frame, 2 bottom element of an element of the experimental section, 3 diagonal rib, F water pressure force

### Inclination adjustment

All experimental flumes can be inclined, which means that the slope is adjustable. The current slope can be read directly on a scale (HM 160, HM 162, HM 163) or a digital display (HM 161).

Inclination adjustment in HM 160 is manual and electrical in HM 161.

In HM 162 and HM 163 the inclination can be adjusted either manually or electrically. With an experimental section above 7,5m we recommend electrical inclination adjustment HM 162.57 / HM 163.57.



Inclination adjustment in HM 162 and HM 163:  
left manual, right electrical inclination adjustment HM 162.57 / HM 163.57



Electrical inclination adjustment in HM 161

Manual inclination adjustment in HM 160

### Materials used

In all experimental flumes, the bottom of the experimental section is made of stainless steel. Tempered glass is used for the side walls of the experimental section. It is scratch resistant, does not age and does not deform. The water tank, inlet and outlet elements are made of corrosion-resistant GRP (glass

reinforced plastic) or steel. The piping is PVC. The models used in the experimental flumes consist of aluminium, stainless steel, PVC or Plexiglas.