Dynasonics®
Ultrasonic Flow Meters

IS-6000

Doppler Tension and Spring Rings

Badger Meter

HYB-UM-04287-EN-01 (January 2024)

User Manual

INTRODUCTION

This manual describes the preparation and use of GWF Technologies GmbH sensor mounting systems.

To install a submerged pressure sensor in a round pipe using a tension ring of a fixed size, locate the pressure sensor on the carrier plate. As you follow the row to the right, note that a combined carrier plate is required.

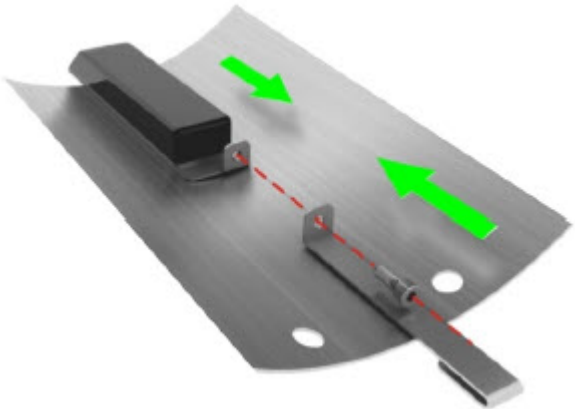
Continue to follow the row over to Installation System and the table refers you to the corresponding page to attach the sensor to the carrier plate to complete the installation.

Installation

When a carrier plate is required, first attach the sensor to the carrier-plate and then screw it in with the draw shackle onto the corresponding mounting ring.

A carrier plate along with the draw shackle is an adapter that firmly holds the sensor to the mounting ring, yet allows the sensor to be easily attached or removed from the mounting system.

Both the carrier plate and the combined carrier plate along with the draw shackle can be used for the tension ring for a fixed size or a scissors ring.

Figure 1: Carrier plate with draw shackle	*Figure 2: Mounting the carrier plate with the draw shackle on a tesnion ring*
	

Combination Sensor

Before mounting the combination sensor on the mounting ring, first attach it to the carrier plate. The sensor will be fastened with two screws on the carrier plate with the draw shackle at a later step.

1. Use the two attached screws to mount the combination sensor on the carrier plate.

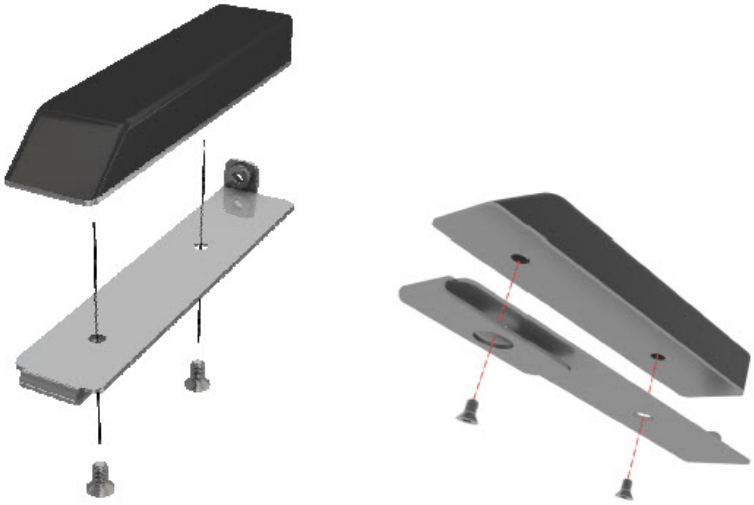


Figure 3: Attach combination sensor to carrier plate

2. Once secured to the carrier plate, the combination sensor can be mounted on the desired specific mounting ring. To continue with attaching the sensor and carrier plate to the mounting ring, refer to the next section.

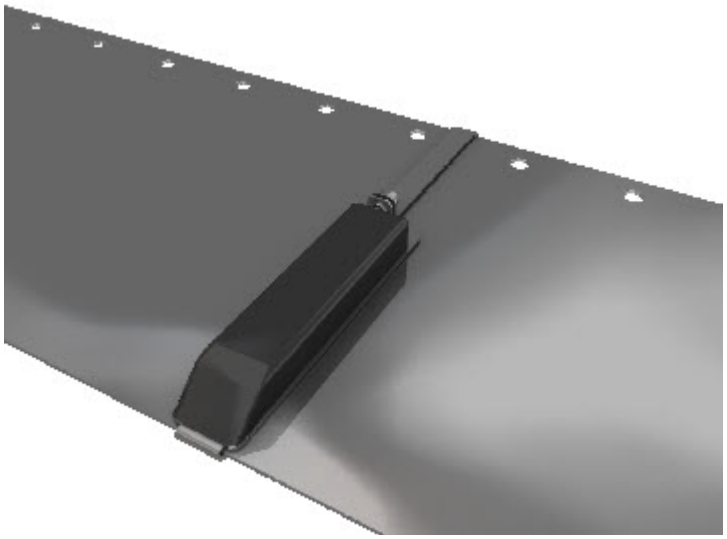


Figure 4: Continue attaching sensor and carrior plate to mounting ring

MOUNTING RINGS - TENSION RING

Stainless steel tension rings simplify sensor installation in closed cylindrical pipes. Four diameter sizes are available: DN 200, 250, 300, and 400mm (8, 10, 12, and 16 inches). These mounting rings are compressed against the pipe wall by tightening a pre-assembled hexagon tensioning screw.

NOTE: Maximum tensioning range for the tension rings: -10 to +2 mm.

Preparation

The carrier plate, optional either with the combination sensor, the pressure sensor or both, is mounted directly on the tension ring. It will be affixed with draw shackle.

Route the sensor cable along the tension ring's edge with holes. Note that you can route the cable either to the left or right on the ring. Secure the cable in position by placing plastic cable ties through the holes and then locking them around the cable.

To prevent debris from catching on the cable, attach the cable so that it offers as little resistance to the flow as possible. Avoid loops or slack sections in the cable. Attach it neatly and closely to the tension ring.

Using an adequate (15mm) jaw wrench, twist the hexagon tensioning screw to minimize the outer diameter of the tension ring as far as possible.

Figure 5: Prepared tension ring

Installation

After the carrier plate and cable have been attached to the tension ring, insert desired pipe through corresponding manhole. Take the tension ring and push it into the pipe to the desired distance. Tense up pre-mounted tension ring toward pipe wall by twisting tensioning screw with a jaw wrench (15mm). Properly route and affix cable along the wall of the manhole up to the street level.

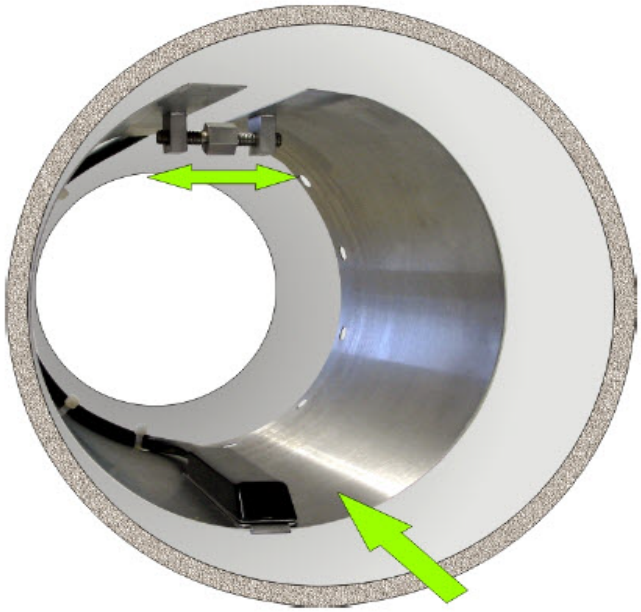


Figure 6: Tension ring placed in pipe

Tension Ring Part Numbers	
Diameter / mm	**Diameter / in.**
200 mm	8 in.
250 mm	10 in.
300 mm	12 in.
400 mm	16 in.

MOUNTING RINGS - SCISSORS RING

Mounting in Pipes

The adjustable scissors ring installs in pipes 510mm (20inches) in diameter and larger. The scissors ring is sold in sets assembled from seven basic parts: base element, a scissors mechanism, four different sized extensions, and a hardware kit. The assembled rings can fit pipe diameters from 510 mm to 2080 mm (20 in. to 82 in.). Ring sections are 0.8 mm (.030 in.) thick and made from stainless spring steel. All other parts are also stainless steel, except for the plastic cable ties in the hardware kit.

The scissors mechanism provides approximately 360 mm (14 in.) of adjustment, used to tighten the ring assembly. Each extension, 1, 2, 3 and 4, adds 330 mm (13.0 in.), 550 mm (21.5 in.), 800 mm (31.5 in.) or 1050 mm (41.5 in.), respectively, to the circumference of the ring. Used alone, the base section fits an 510 mm (20 in.) diameter pipe. The 330 mm (13.0 in. - the smallest) extension is used to take up or remove slack in larger pipe sizes where variations in circumference can occur. The scissors mechanism will work best if the completed assembly allows the scissors to secure the ring near the middle of its adjustment range. The base element accepts the above mentioned carrier plates with the corresponding Combination and/or Pressure Sensor.

Assembly

When assembling the ring sections, make sure the tongue sections are correctly inserted into the slotted sections. Note the accompanying diagram in Figure 7. A flat blade screwdriver may help slide the tongue sections through the slots.

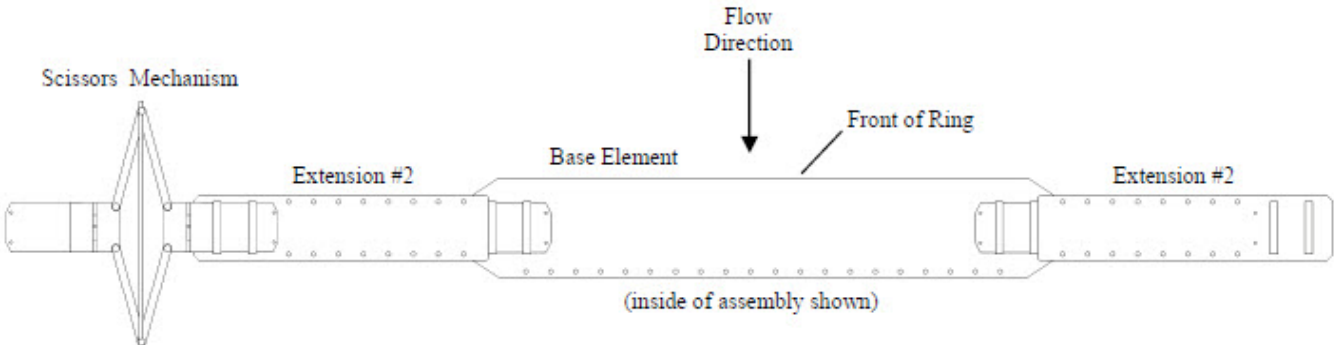


Figure 7: Scissors Ring

In large pipes, you may find it useful to assemble the base and extensions above ground, (without connecting it into a circle), before entering the manhole. Then you can pass it down the manhole to connect the final piece.

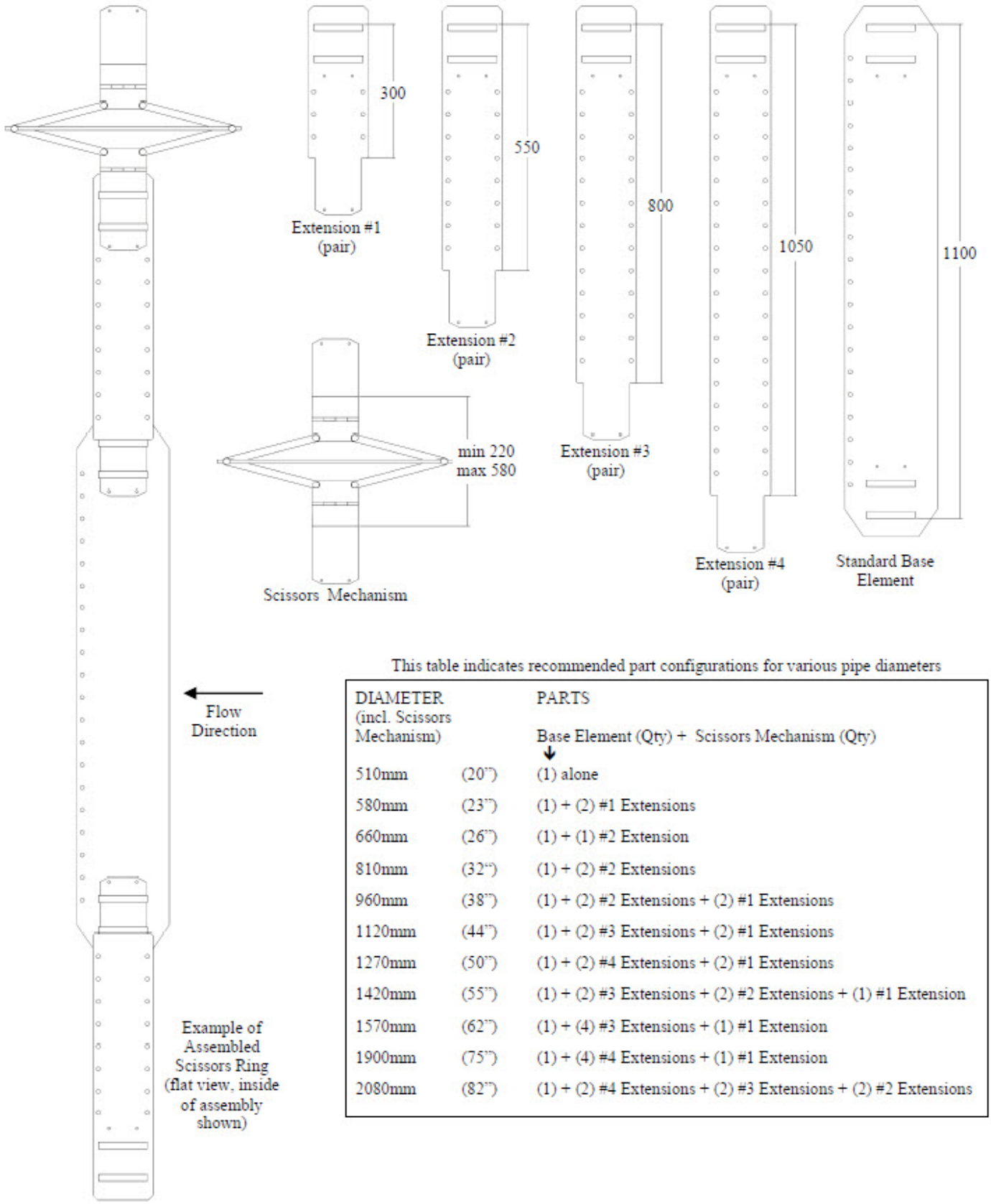
A hardware kit includes flat head bolts and nuts that you can use to bolt sections of the ring assembly together. This is recommended when installing the ring into the larger pipe sizes where significant flow exists. If there is high flow, the ring can thrash around during installation before the scissors mechanism can be tightened. Bolting the tongue sections together can greatly increase safety and prevent the assembly from being torn apart.

The carrier plate, optional either with the combination sensor, the pressure sensor or both, is mounted directly on the base element of the scissors ring. It will be affixed with draw shackle.

After assembling the ring, route the sensor cables along the edge with holes. Secure the cable in position by placing plastic ties through the holes and then locking them around the cable. To prevent debris from catching on the cable, attach the cable so that it offers as little resistance to the flow as possible. Avoid loops or slack sections in the cable. Attach it neatly and closely to the ring. Note that you can route the cable either to the left or right on the ring.

Installation

Fit the assembled scissors ring into the pipe and push it upstream to the desired distance. It may be necessary to rotate the ring to position the sensor in the bottom center of the pipe. Once in position, secure the assembly in place by gently tightening the supplied scissors mechanism with a 13 mm jaw wrench or other suitable tool. Do not over-tighten the mechanism; it is designed to flex somewhat to provide a positive lock once moderately tightened. Route the sensor cable out of the pipe so that it does not collect debris or disturb the flow.



This table indicates recommended part configurations for various pipe diameters

DIAMETER (incl. Scissors Mechanism)		PARTS Base Element (Qty) + Scissors Mechanism (Qty)
510mm	(20")	(1) alone
580mm	(23")	(1) + (2) #1 Extensions
660mm	(26")	(1) + (1) #2 Extension
810mm	(32")	(1) + (2) #2 Extensions
960mm	(38")	(1) + (2) #2 Extensions + (2) #1 Extensions
1120mm	(44")	(1) + (2) #3 Extensions + (2) #1 Extensions
1270mm	(50")	(1) + (2) #4 Extensions + (2) #1 Extensions
1420mm	(55")	(1) + (2) #3 Extensions + (2) #2 Extensions + (1) #1 Extension
1570mm	(62")	(1) + (4) #3 Extensions + (1) #1 Extension
1900mm	(75")	(1) + (4) #4 Extensions + (1) #1 Extension
2080mm	(82")	(1) + (2) #4 Extensions + (2) #3 Extensions + (2) #2 Extensions

Figure 8: Scissors Ring Parts

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