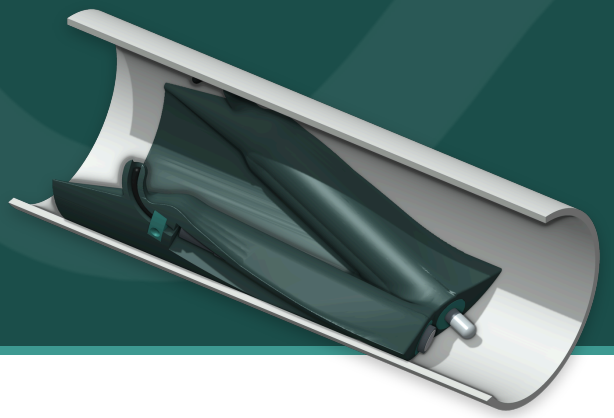
PATENT PENDING

UNIVERSAL SENSOR MOUNT FOR GRAVITY SEWERS

Sensor Fort

Designed and built in Australia to solve the problem of installing analytical sensors in a gravity sewer network.



Sensor Fort is a low moulded saddle that sits on the invert of the pipe at a manhole. Two sensors lie inside it, 15° tip down, while the flow rides up the saddle, spills over a lip and runs fast across their tips.

The shape gives rag no leading edge to wrap around, keeps every cable out of the flow and holds the sensor tips at the lowest and fastest point of the sewer.

Clients fit their own sensors, certified for their own zones, in sleeves supplied by EDS. The spill lip also acts as a hydraulic control, so an upstream level sensor allows flow to be reported from the same site.

Sensor Fort in a 150 mm sewer, shown with the pipe cut away



From downstream. Two sensor tips sit at the foot of the stern, below the spill lip, and the centre of the sewer remains open above the valley.

2 sensors	12 months	150 to 1050 mm	80 mm	Passive
IN EACH MOUNT	DESIGN INTERVAL	SEWER DIAMETER	LARGEST BODY	NO POWER

RAG · SHAPE

Nothing to wrap around

The saddle spans the wetted invert and feathers into the pipe wall, so that flow and rag can only pass over it. Sensor bodies, clamps and cables all remain inside.

SENSORS · ANY MAKER

One mount, any maker

A sleeve adapts each sensor to its bay. The larger the sewer, the larger the sensor its Sensor Fort accepts, from 12 mm electrodes to 80 mm sondes.

SERVICE · ON THE BENCH

Loaded on the bench

Sensors are fitted, calibrated and capped on the bench. A loaded mount is installed on an EDS expansion band, with nothing drilled, and is later exchanged for a fresh one.

Applications

Trade waste

pH and conductivity at a discharge point or in the receiving sewer.

Source tracking

Paired sites that narrow down where an abnormal discharge enters the network.

Saline ingress

Conductivity changes that reveal saline water entering the network.

Odour control

pH and dissolved oxygen trends that support septicity and dosing studies.

02 Technical specifications

The hydraulic figures on this page are for the SF 375. Section 04 lists every model.

GENERAL

Product	Sensor Fort (SF), passive sensor mount
Origin	Designed and built in Australia by EDS
Function	Holds one or two analytical sensors on the invert, with only their tips in the flow
Pipe diameters	150 mm to 1050 mm, with one model for each pipe diameter
Pipe shape	Circular pipe; U shaped channels on request
Operation	Passive, with no moving parts, no electrical parts and no power
Protection	Patent pending

SENSOR BAYS

Number	Two bays; a blanking plug closes an unused bay
Sensor size	Bodies to 28.5 mm in SF 150 and SF 225, 35.5 mm in SF 300 and SF 375, and 51 mm from SF 450
Attitude	Sensors lie 15° tip down, with their tips pointing downstream
Tip exposure	Flat tips sit flush with the stern; a 12 mm electrode stands 20 mm proud
Sensor types	Any cylindrical sensor that measures at its tip, including pH, ORP, conductivity and dissolved oxygen
Bay sealing	The bays flood in service; use plugs rated for immersion or a removable sealing gel

FASTENING

Sleeve	One for each sensor family; sets the tip at the stern
Clamp bar	One bar beneath the stern and one M5 × 16 socket head cap screw fasten both sleeves
Cable clamp	One for each cable, with one M4 × 12 screw; takes any pull on the cable

SERVICE

Concept	Sensors are loaded and calibrated on the bench, and the whole mount is exchanged
Interval	Designed for 12 months between visits
Sensor care	No mount can prevent biofilm growth or reference ageing, so sensor choice and data checks still apply

MATERIALS

Body	Moulded polymer, in cast polyurethane or HDPE
Other parts	Engineering polymer sleeves and clamps; 316 stainless steel band and fasteners
Mass	About 0.5 kg for the SF 150, without sensors
Classified zones	No electrical parts; specify a static dissipative body grade. Sensors are certified by the client

INSTALLATION

Position	Incoming pipe of a manhole, or the outlet pipe where flow is also measured
Fixing	EDS expansion band, with nothing drilled
Orientation	Thin feathered nose upstream, sensor tips downstream
Cable route	Beneath a hood on each shoulder, then in a covered channel to the obvert
Access	Confined space entry, as for an EDS flow sensor
Cleaning, CCTV	A jetting nozzle or camera crawler cannot pass; agree a removal procedure with the asset owner

HYDRAULICS, SF 375

Lip height	45 mm, or 12% of the diameter
Area occupied	7% of the pipe area at the widest section
Upstream rise	Up to 40 mm at a grade of 0.25%, 47 mm at 0.5% and 88 mm at 1%
Tips covered	Above about 2.5 L/s for a 35 mm sensor body

FLOW INDICATION

Principle	The spill lip acts as a hydraulic control, so upstream depth rises predictably with flow
Measurement	Level sensor above the chase of the manhole, or a pressure sensor in it, with the mount in the outlet pipe
Rating	Calculated rating curve for each model. SF 375: about 62 mm at 1 L/s, 113 mm at 10 L/s and 193 mm at 40 L/s
Conditions	Free flow over the lip; the rating does not apply once the lip is drowned

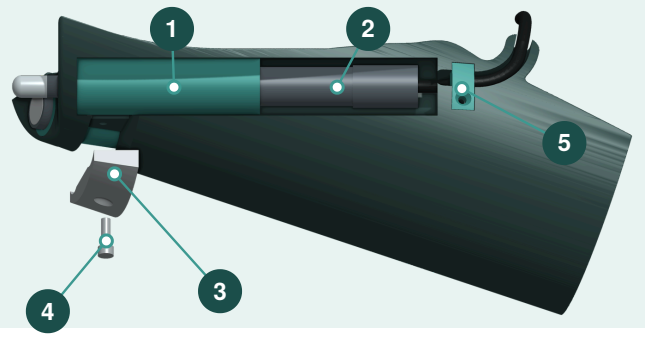
03 Sensor fit and fastening

There is one Sensor Fort for each pipe diameter, and the larger the sewer, the larger the sensor it accepts. The fit figures are drawn from an EDS survey of 48 pH, conductivity and dissolved oxygen sensor models from 22 makers, conducted in November 2026. Please confirm the fit of your sensor with EDS before ordering.

MODELS	LARGEST SENSOR BODY	TYPICAL SENSOR FORMATS	SURVEYED MODELS THAT FIT
SF 150, SF 225	28.5 mm by 190 mm	12 mm electrodes in a sleeve, compact 22 mm sensors and 3/4 inch NPT bodies	26 of 48, or 54%
SF 300, SF 375	35.5 mm by 270 mm	In addition, 1 inch NPT bodies and 35 mm differential sensors	36 of 48, or 75%
SF 450 to SF 1050	51 mm by 315 mm	In addition, 1.5 inch NPT bodies, 51 mm differential sensors and optical oxygen sensors	46 of 48, or 96%
To order, from 525 mm	80 mm by 600 mm	Multiparameter sondes and long armatures	48 of 48

SLEEVES AND PARTS, SF 150 AND SF 225

12 mm electrode	Threaded sleeve for electrodes 120 mm long with a PG13.5 thread; leaves 20 mm of the tip in the flow
22 to 26.7 mm	Split sleeves for 22.0, 22.9, 25.4, 26.0 and 26.7 mm bodies; the 26.7 mm sleeve also suits 3/4 inch NPT threads
28 to 28.5 mm	Shims, as these bodies pass the stern ring bare
Tail ring, plug	A tail ring centres the rear of a slim body, and a blanking plug closes an unused bay
Plug head	Allow up to 24 mm in diameter for the plug head and cable coupling
Larger models	Sleeves are supplied to suit the sensors ordered



1 Sleeve
2 Plug head
3 Clamp bar
4 M5 screw
5 Cable clamp

Figure 1. The open side of a bay, which the pipe wall closes once the mount is installed.

LOADING A SENSOR, ON THE BENCH

1. **Sleeve.** Screw a 12 mm electrode into its sleeve until the O ring seats, or slide a split sleeve over the nose of a larger body.
2. **Lay in.** Turn the mount over, lay the sensor in the open bay and slide it downstream until the sleeve meets the stern ring.
3. **Fill the other bay.** Fit the second sensor or a blanking plug, because the clamp bar needs a sleeve in both bays.
4. **Clamp.** Seat the clamp bar in its pocket and tighten the M5 screw from underneath; a quarter turn past contact is sufficient.
5. **Cable.** Connect the cable, lay it in its groove and fit the cable clamp, leaving a little slack between the plug and the clamp.
6. **Seal and cap.** Seal the plug for immersion, calibrate the sensor and keep the tip capped and wet until the mount is installed.

Conductivity. In sewers smaller than 450 mm, use a four electrode conductivity sensor. Inductive heads fit the SF 450 and larger models by size but require a site check, because the whole head must stand in the flow.

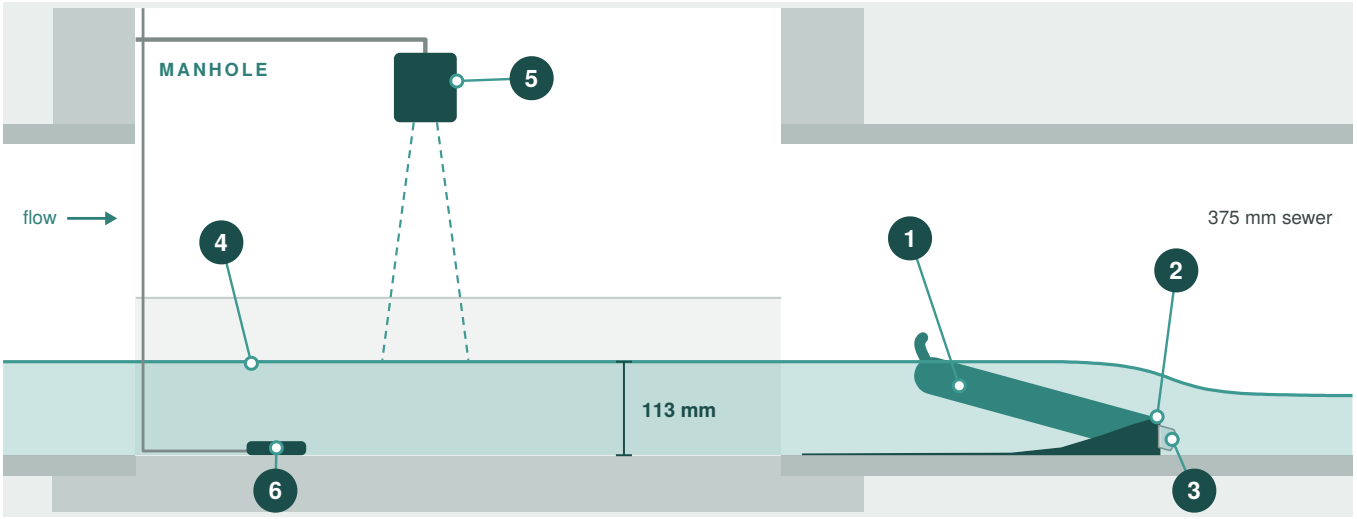
A sensor too large for the sewer. pH, ORP, conductivity and dissolved oxygen sensors are all available as 12 mm electrodes, a format that fits every Sensor Fort.

04 Range and hydraulic footprint

There is one Sensor Fort for each pipe diameter. Each forms a low hump in the sewer, so upstream connections and overflow levels should be checked against these figures before a site is chosen.

MODEL	PIPE DIAMETER	LARGEST SENSOR BODY	LIP HEIGHT	LENGTH	AREA OCCUPIED	TIPS COVERED ABOVE	RISE AT GRADE OF 0.1%	0.5%	1%
SF 150	150 mm	28.5 mm	40	314	26%	0.4 L/s		41	59
SF 225	225 mm	28.5 mm	39	320	12%	0.4 L/s		36	60
SF 300	300 mm	35.5 mm	46	426	10%	2.5 L/s		45	78
SF 375	375 mm	35.5 mm	45	433	7%	2.5 L/s		47	88
SF 450	450 mm	51 mm	62	531	9%	5.5 L/s	53	67	120
SF 525	525 mm	51 mm	61	540	7%	5.5 L/s	52	71	
SF 600	600 mm	51 mm	61	573	6%	6 L/s	52	75	
SF 750	750 mm	51 mm	61	639	4%	6.5 L/s	51	84	
SF 900	900 mm	51 mm	60	686	3%	8 L/s	50	95	
SF 1050	1050 mm	51 mm	60	721	2%	8.5 L/s	49	107	

Dimensions and rises are in millimetres, and each model holds two sensors. Lip height is measured from the invert to the spill lip. Area occupied is the share of the pipe area taken up by the mount at its widest section. Tips covered above is the calculated flow above which the sensor tips are fully under water. Rise is the largest calculated rise in the upstream water level over the flow range; a blank cell falls outside the grades calculated for that model. Sensor Forts for sondes up to 80 mm in diameter are made to order for sewers of 525 mm and larger, as are sizes between those listed.



1. Sensor Fort in the outlet pipe
2. Spill lip, the hydraulic control
3. Sensor tips
4. Pool held in the chase
5. Level sensor above the chase
6. Or a pressure sensor in the chase

Figure 2. Flow indication with the SF 375 in the outlet pipe of a manhole and a level sensor above the chase. The depth shown was calculated for 10 L/s at a grade of 0.5%. The figure is schematic.

SITE CHECK

Upstream level. Check upstream connections and overflow levels against the rise shown in the table.

Low flow. Below the flow shown in the table the sensor tips are partly exposed, and at zero flow they drain, so choose a sewer with a continuous base flow.

Capacity. Avoid sewers that surcharge in dry weather, because the pipe upstream of the mount runs full first.

Sediment. Solids can settle in the upstream pool in dry weather, but the tips sit downstream of the lip, clear of the deposit.

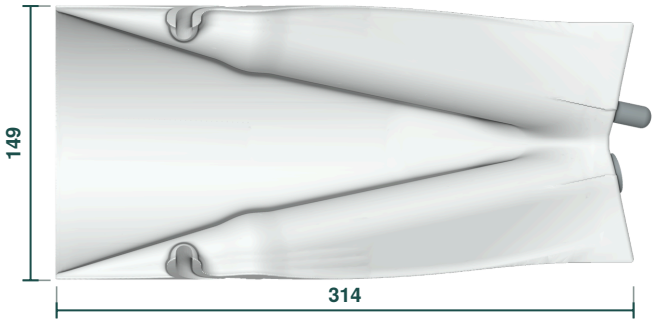
Steep sewers. Above a grade of about 0.7% the flow is supercritical, and a hydraulic jump forms upstream of the mount.

Cleaning and CCTV. A jetting nozzle or camera crawler cannot pass the mount, so agree a removal procedure with the asset owner.

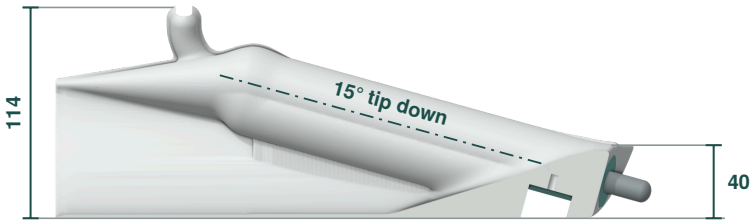
05 Dimensions, installation and ordering

Dimensions of the SF 150, for a 150 mm sewer, in millimetres. The other models are listed in section 04.

PLAN



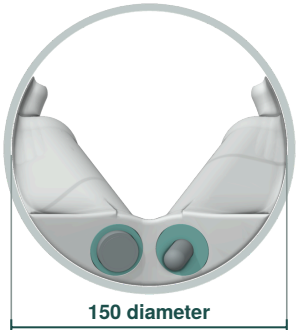
SECTION ON THE CENTRE LINE



SF 150

Length	314 mm
Width	149 mm
Height	114 mm at the cable hoods
Lip height	40 mm above the invert
Sensor axis	15° tip down
Bay diameter	31.0 mm, stern ring 29.4 mm

VIEW FROM DOWNSTREAM



INSTALLATION AND SERVICE

1 Survey
Record the pipe diameter and condition, the overnight depth, the peak velocity and any silt.

2 Load
Sleeve and clamp each sensor, clamp its cable, then calibrate and cap the tips wet.

3 Install
Fit the band and the mount in the pipe, with the thin nose upstream.

4 Check
Compare each reading with a handheld meter in the flow and record the offsets.

5 Leave
The mount is designed for 12 months between visits.

6 Swap
Exchange the whole mount for a freshly loaded one.

SUPPLIED BY EDS

- The mount, made to the diameter of the sewer, with its clamp bar and cable clamps
- Sleeves, shims and plugs to suit the client's sensors
- The EDS expansion band and the cable channel
- Bench loading, installation and the exchange service
- The Metalog 4G logger, FlowSense and an upstream level sensor for flow, where required

SUPPLIED BY THE CLIENT

- Sensors and transmitters, certified for the client's zone
- The logger or RTU, unless EDS supplies it
- Site access and the asset owner's approvals

ORDERING INFORMATION

Model code	SF followed by the pipe diameter in millimetres; for example, SF 375
Pipe	Internal diameter, material and condition
Hydraulics	Grade, dry weather flow range and overnight depth
Sensors	Make, model, body diameter and length, thread and plug head
Site	Depth of the manhole and the position of the pipe

Patent pending. Hydraulic figures are calculated with the EDS hydraulic model. EDS reserves the right to change specifications without notice.