



## SEDIMENT TRANSPORT TEST CIRCUIT

The RD&I department of Damen Dredging Equipment has designed an innovative sediment transport test circuit. The circuit simulates all circumstances of the transport of a sand/water mixture and can be used for dredge production estimations and wear predictions.

### CHARACTERISTICS

The infinite circuit is intended to simulate the harsh conditions of a real dredge installation. All components used are standard heavy duty Damen quality dredging components.

The standard test pipe is a 8.0m long straight pipe section of  $\varnothing 250\text{mm}$  for the installation of components or prototypes to be tested in the dredge processes. If required the circuit can be elongated to accommodate for tests with a longer running length.

The circuit is based at the Damen Dredging Equipment yard, yet it can be shipped to your own premises.

### CONSTRUCTION

All main components of the dredge slurry test circuit are installed on a standard 40 feet flatbed container frame. The installation is dismountable and all components can be transported in a container along with the flatbed to any location. Also a dedicated power pack is used to operate all the hydraulics.

### FLUSH WATER

For proper operation of the installed dredge valves, a flush water pump is installed. This flush water is also used for topping up the circuit for compensating the volume differences due to the filling and emptying of the pipes. Furthermore is this flush water pump used for pressurizing the pipeline to the required pressure (up to 16 bar).

### MIXTURE DENSITY

The mixture density can be adjusted by regulating the gap between the bottom of the storage unit and the overflow to allow sand to enter the system. By closing the overflow the sand will be trapped inside the storage unit to decrease the density of the mixture. The type of sand can be changed during the test period.

### CONTROL

All instrumentation and equipment is PLC controlled over a field bus with remote WiFi access. Monitoring and control can be done locally by a touch screen, or from the convenience of your own desk. If required we can support you remotely over internet by our specialized research staff.

An iPad application is foreseen in the near future to have complete control while walking along the test circuit.

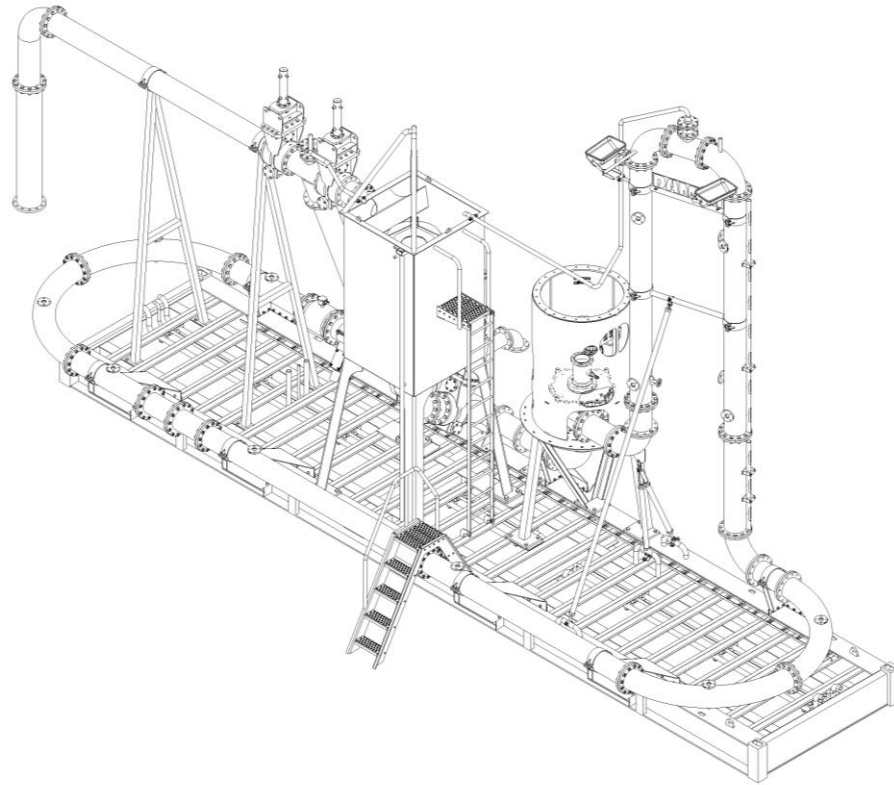
### INSTRUMENTATION

All instruments used are calibrated, certified and fit for the dredging industry. The instrumentation gear comprises:

- Dredge pump speed sensor
- Mixture electromagnetic flow meter
- Radio active density meter
- U-bend density meter
- Suction and discharge pressure sensors
- Two storage unit level switches
- Flow switch flush water
- All dredge valves and overflow cylinder are equipped with continuous position measurement

The U-bend density meter comprises of two differential pressure sensors, which will be calibrated automatically after a certain time. All measured process indicators can be recorded by the PLC or by a separate high rate sampling recorder. Ample additional I/O's are provided for controlling and monitoring additional hardware.

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#### MAIN DIMENSIONS

Length	13.70	m
Width	4.50	m
Height	7.50	m
Weight	20	ton

#### DREDGE PUMP

Type	DOP250
Size	ø250 mm
Flow range	400-1200 m <sup>3</sup> /h
Maximum pressure	5.2 bar
Maximum speed	900 rpm
Power	180 kW
Hydraulic flow	430 l/min
Hydraulic pressure	250 bar

#### DREDGE PIPE

Size I.D.	ø253 mm
Wall thickness	10 mm

#### DREDGE VALVES

Type	DGV250
Nominal pressure	16 bar

#### FLUSH WATER

Pressure	4-16	bar
Flow	max 20	m <sup>3</sup> /h
Connection	100	mm

#### STORAGE UNIT

Storage volume	3.2	m <sup>3</sup>
Overflow dimension	ø650/ø300	mm

#### INSTRUMENTATION

Dredge pump speed sensor	Damen
Mixture flow meter	Krohne
Radio active density meter	Berthold
U-bent density meter	Damen
Suction and discharge pressure sensors	VEGA
Storage unit level indicator	VEGA

#### CONTROL

PLC	Siemens
Screen	Touch screen 12"
Casing	IP66 Stainless Steel
Number of I/O's (Analog/Digital/Counter)	173

# DAMEN

DAMEN DREDGING EQUIPMENT

Member of the DAMEN SHIPYARDS GROUP 

Edisonstraat 32  
3861 NE Nijkerk

P.O. Box 1021  
3860 BA Nijkerk  
The Netherlands

phone +31 (0)33 247 40 40  
fax +31 (0)33 247 40 60

info@damendredging.com  
www.damendredging.com

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