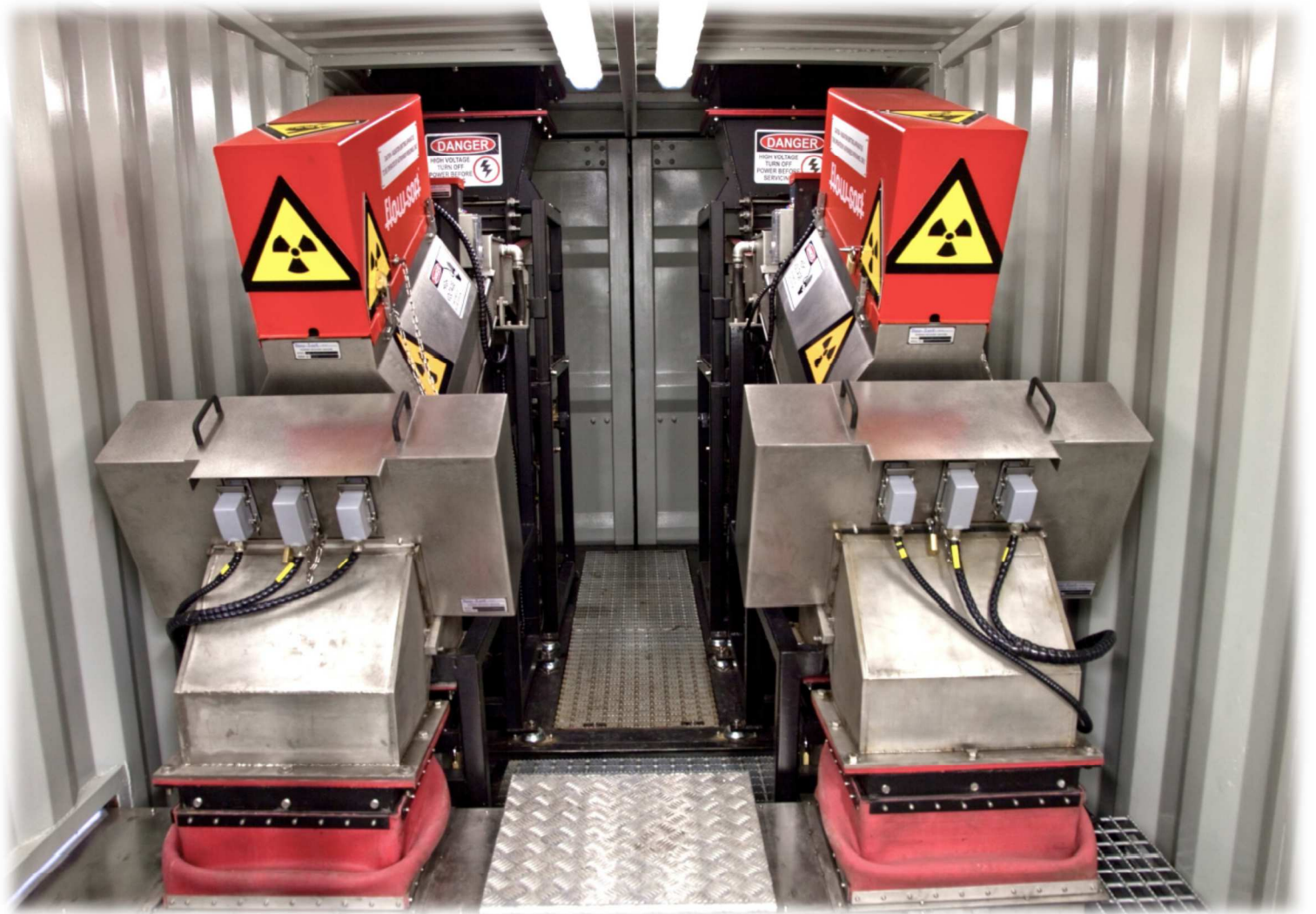


Flow electronics

LEADERS IN DIAMOND RECOVERY TECHNOLOGY

ESTABLISHED IN 1971

FLOW SORT™ X-RAY DIAMOND RECOVERY MACHINES



[TS]XR 400 DW FAMILY

**OF THE 640 SORTERS SOLD 620 ARE IN
OPERATION WORLD WIDE!**

TECHNICAL SPECIFICATIONS

[TS]XR 400 DW or [TS]XR 400f DW

X-RAY DIAMOND RECOVERY MACHINE

GENERAL

FLOW X-ray diamond recovery machines are based on X-ray induced luminescence of diamonds. Although this basic principle goes back to the 1930s and became popular in South Africa in the early 70s FLOW has pioneered and introduced much advancement in this technology. Since the launch of FLOW'S "XR" sorter range in 1993, FLOW has sold over 640 units to diamond miners and diggers all over the world.

FLOW SORT 'XR' diamond recovery machines are designed to sort DRY OR WET diamondiferous material, under virtually any conditions. Model **XR 400 DW**, **TSXR400 DW**, **XR 400f DW** and **TSXR 400f DW** is the latest addition to the FLOW SORT sorting machine stable.

All FLOW SORT models are equally suitable for 'fixed' installations as for 'mobile' plants, be it on terra firma or on board a 'marine' diamond-mining vessel.

It is our sorter's robustness, reliability, high recovery efficiency, easy operation and low maintenance, as well as our uncompromising after-sales service that earned our products acceptance in the market place.

An optical scanning system specifically designed for the recovery of low luminescent diamonds is a standard feature on the **[TS]XR 400 DW** or **[TS]XR 400f DW**.

FLOW SORT MODEL & CONFIGURATION

The **[TS]XR 400 DW** or **[TS]XR 400f DW**, in its basic configuration this machine is set up as a primary sorting machine with a 400 mm wide feed channel which is divided into 16 optical diamond detection channels.

ELECTRIC SUPPLY SPECIFICATION:

XR400 models:	230 Volt (+/- 10%), 50 Hz, Single Phase	/	380 Volt (+/- 10%), 50Hz, 3Phase
	Power consumption approx. 2kVA.	/	Power consumption approx. 3kVA.
TSXR400 models:	230 Volt (+/- 10%), 50 Hz, Single Phase	/	380 Volt (+/- 10%), 50Hz, 3 Phase
	Power consumption approx. 3.5kVA.	/	Power consumption approx. 5kVA.

Other Electrical Supply Specifications can be accommodated on request.

Flow Sort lightning and surge protection units, as well as phase failure detection, and voltage stabilizer units, available as optional extra, are specifically designed for FLOW SORT™ products.

WATER SUPPLY SPECIFICATION:

QUALITY:	Water supply must be filtered through a 100 Micron filter.	
PRESSURE:	Recommended water supply pressure is 600kpa. (Max: 800kpa, Min: 400kpa)	
TEMPERATURE:	MIN: +2.5°C	MAX: +30°C
CONSUMPTION:	Feed water consumption (flow rate) largely depends on feed-rate, material size and type of material to be sorted (ranging from 60 l/min to 160 l/min).	
	Volume XR400: Typically 80 litres / minute	XR400F: 30 litres / minute
	Volume TSXR400: Typically 155 litres / minute	TSXR400F: 55 litres / minute

OPERATING TEMPERATURE RANGE:

SORTER:	MIN: +2.5°C	MAX: +45°C	REL. HUMIDITY: 95% (non-condensing)
CONTROL PANEL:	MIN: -5°C	MAX: +45°C	REL. HUMIDITY: 95% (non-condensing)

FEED MATERIAL SPECIFICATIONS:

[TS]XR400f DW (Fines)	Minimum SIZE	Recommended minimum is 1 mm . (There is no minimum size limit!)
	Maximum SIZE	Recommended maximum is 42 mm . (Absolute max particle size is 50 mm)
[TS]XR400DW (Course)	Minimum SIZE	Recommended minimum is 10 mm .
	Maximum SIZE	Recommended maximum is 60 mm . (Absolute max particle size is 75 mm)

PARTICLE SIZE RATIO:

For maximum recovery efficiency we recommend a size ration of 2:1 for material below 4mm and up to 3:1 for material above 3mm.

RECOMMENDED SIZE FRACTIONS:

Typical fractions: + 1mm - 2mm, + 2mm – 4mm, + 4mm - 10mm, + 10mm - 25mm, + 25mm – 75mm

NOTE FLOW SORT OFFERS A PROFESSIONAL CONSULTING SERVICE TO ADVISE ON OPTIMAL SIZE SPLITS FOR SPECIFIC APPLICATIONS.

FEED MATERIAL PRESENTED TO THE SORTERS MAY BE WET OR DRY. IT IS HOWEVER IMPORTANT THAT THE MATERIAL IS 'CLEAN' i.e. FREE OF CLAY, SLIME, VEGETATION OR OTHER FOREIGN OBJECTS.

IT IS ALSO OF IMPORTANCE THAT THE MATERIAL TO BE SORTED IS APPROPRIATELY SIZED AND FREE OF UNDERSIZED AS WELL AS OVERSIZED MATERIAL.

FEED RATE SPECIFICATIONS

Sorter feed rate 'FR' (kg/hr) is computed by using the following approximations:

$$FR \text{ (kg/h)} = SC \times d \text{ (mm)} \times SF \times s.g.$$

d = AVERAGE PARTICLE DIAMETER (IN A GIVEN SIZE FRACTION) in **mm**

SC = "SORTER CONSTANT" This value varies with sorter configuration and application (for model XR400DW from 200 to 400). For primary recovery application this value is typically 300

SF = 'SHAPE FACTOR' = the particle volume expressed as a portion of the volume of a sphere with diameter 'd'. (A particle with 60% of volume of a sphere of diameter 'd' results in a 'SHAPE FACTOR' = 0.6)

s.g. = AVERAGE SPECIFIC GRAVITY OF FEED MATERIAL (g/cm3)

FEED RATE (kg/hr) for the [TS]XR 400f machine with a SC of 300, fed with 'NORMAL' shaped material (SF ± 0.6) with an s.g. ± 2.7. The sorter feed capacity is approx equal to **FR ≈ 500 x d**

FEED RATE (kg/hr) for the [TS]XR 400 machine with a SC of 300, fed with 'NORMAL' shaped material (SF ± 0.6) with an s.g. ± 2.7. The sorter feed capacity is approx equal to **FR ≈ 500 x d**

YIELD:

[TS]XR400f DW - The sorter produces concentrate equivalent to approx.: **12 x FR x 10⁻⁶** per ejection (**0.0012% of FR**)

[TS]XR400DW - The sorter produces concentrate equivalent to approx.: **24 x FR x 10⁻⁶** per ejection (**0.0024% of FR**)

RECOVERY EFFICIENCY:

Diamond recovery efficiency is influenced by many factors such as feed rate, feed material particle size ratio, feed material temperature, feed material contamination with fines and dirt, and so on.

Diamond detectability based on x-ray luminescence, varies with a diamond's colour, impurities, level of transparency, its nitrogen content etc. **FLOW SORT has developed technology that is capable of detecting the most faintly luminescent diamonds under the most difficult of circumstances!**

In practice, based on over 600 FLOW SORT machines operating around the world, we are proud to say, that we have never encountered a case where actual diamond recovery efficiency of a properly set-up and maintained FLOW SORT was below 98 % (percentage calculated by number)! Recovery efficiency figures run very close to 100 %, when based on diamond value rather than number.

FLOW SORT OFFERS A DIAMOND LUMINESCENCE EVALUATION SERVICE, GEARED TO DETERMINE EXACTLY WHAT RECOVERY EFFICIENCY CAN BE EXPECTED IN SPECIFIC SORTER APPLICATIONS.

SORTER DIMENSIONS:

For actual machine dimensions refer to General Arrangement drawing No's respectively:

- **XR400-DW_GA-01,CKD** and **FLOW_TSXR400f-GA-V2**

FLOW SORT CONCENTRATE BINS (OPTIONAL EXTRA):

FLOW SORT SUPPLIES SPECIAL HIGH SECURITY CONCENTRATE BINS THAT FIT DIRECTLY ONTO THE SORTERS CONCENTRATE OUTLETS.

MOBILE OPTIONS:

FOR OPTIONAL MOBILE PLANTS, PLEASE REFER TO TRAILER AND CONTAINER SPECIFICATIONS!

FLOW ELECTRONICS (PTY) LTD RESERVES THE RIGHT TO REVISE THIS SPECIFICATION AND TO MAKE CHANGES FROM TIME TO TIME IN THE CONTENTS THEREOF WITHOUT OBLIGATION TO NOTIFY ANY PERSON OF SUCH REVISION OR CHANGES.



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DESIGN AND MANUFACTURE

Flow-sort™

X-RAY DIAMOND RECOVERY EQUIPMENT