

# Flow electronics

LEADERS IN DIAMOND RECOVERY TECHNOLOGY

ESTABLISHED IN 1971

## FLOW SORT™ X-RAY DIAMOND RECOVERY MACHINES



### XR 2/50 DW

OVER 620 SORTERS SOLD WORLD WIDE



LEADERS IN DIAMOND RECOVERY TECHNOLOGY

ESTABLISHED IN 1971

## TECHNICAL SPECIFICATION **XR 2/50 DW AND TSXR 2/50 DW** X-RAY DIAMOND RECOVERY MACHINES

### GENERAL

These diamond recovery machines are specifically designed to sort WET or DRY diamondiferous material, under virtually any conditions, they are the “work-horses” in the FLOW SORT sorting machine stable.

With over 600 sorters sold into the “open” market they have become the most widely used X-ray diamond recovery machines! These sorters are suitable for “fixed” as well as “mobile” installations, be it on land or on sea diamond-mining vessels.

The sorter’s robustness, reliability, high recovery efficiency, easy operation and low maintenance, backed by FLOW’S uncompromising after sales service earned FLOW SORT products acceptance in the market place all over the world.

We offer our sorters in three basic models. **SINGLE STAGE MODELS** coded as **XR 2/50 DW (single pass sorters)** and **TWIN-STAGE MODELS (double pass sorters)** labelled **TSXR 2/50 DW** and **XR 2/50 DW REC (re-concentration sorters)**.

Both **XR** and **TSXR** models are available as standard (STD) as well as marine (SEA) versions.

All sorter models can also be configured as re-concentration sorters (REC) designed to treat the concentrate of several primary sorter models.

From sorter S/N 600 onward all sorters come standard fitted with:

- Automatic Tracer Dispenser
- Automatic Calibration System
- Zero Noise X-ray Generator
- Automatic Tracer Recovery System
- Automatic Stability Control System
- Optic Scanner Unit (SA Pat Appl. No. 2011/07547)

**Sorters with S/N 001 to 600 can be upgraded /retrofitted with these performance enhancing features.  
All upgrades can be done on site. Contact FLOW for details**

### ELECTRIC SUPPLY SPECIFICATION:

**XR models:** 220 Volt (+/- 10%), 50 Hz, Single Phase  
Power consumption approx. 2kVA.

**TSXR models:** 220 Volt (+/- 10%), 50 Hz, Single Phase  
Power consumption approx. 3.5kVA.

Other Electrical Supply Specifications can be accommodated on request.

As optional extras Flow Sort also supplies lightning protection, surge and phase failure protection, as well as voltage stabilizer units.

### WATER SUPPLY SPECIFICATION:

**QUALITY:** Feed Water Supply must be filtered through a 100µm filter.  
**PRESSURE:** Water supply pressure must not be less than 400 kPa and not exceed 800kPa.  
**TEMPERATURE:** MIN: +2.5°C MAX: +30°C  
**Volume XR-:** Typically 15 litres / minute.  
**Volume TSXR-:** Typically 25 litres / minute.

Feed water requirements do vary with sorter feed-rate, sorted material sizes and type of material.  
(from 10 l / min to 80 l / min)

### OPERATING TEMPERATURE:

**SORTER:** MIN: +2.5°C MAX: +45°C REL HUMIDITY: 95% (none condensing)  
**CONTROL PANEL:** MIN: -5°C MAX: +45°C REL. HUMIDITY: 95% (none condensing)



LEADERS IN DIAMOND RECOVERY TECHNOLOGY

ESTABLISHED IN 1971

**FEED MATERIAL SPECIFICATIONS:**

**MODELS XR 2/50 DW & TSXR 2/50 DW**

Minimum SIZE for XR- & TSXR- 2/50DW:

There is no minimum size limit!

Maximum SIZE for XR- & TSXR- 2/50DW:

Recommended maximum is 42mm. **(Maximum is 50mm)**  
(No particle may exceed 50 mm in any dimension)

**PARTICLE SIZE RATIO:**

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

**RECOMMENDED SIZE FRACTIONS:**

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

**TYPICAL SIZE SPLITS for XR-2/50 DW & TSXR- 2/50 DW are:**

**4 fractions:**    + 2mm - 4mm,                    + 4mm - 10mm,                    + 10mm - 22mm,                    + 22mm - 42mm

**3 fractions:**    +2mm – 5mm,                    +5mm – 12mm,                    +12mm – 32mm

FEED MATERIAL CAN BE WET OR DRY. IMPORTANT IS THAT THE MATERIAL IS “CLEAN” i.e. FREE OF CLAY, SLIME, VEGETATION OR OTHER FOREIGN OBJECTS.

FEED MATERIAL MUST BE PRESENTED IN APPROPRIATE SIZE-RANGES AND FREE OF UNDERSIZED AS WELL AS OVERSIZED MATERIAL.

**FLOW SORT CONCENTRATE BINS (Optional Extra)**

FLOW SORT SUPPLIES HIGH SECURITY SELF-LOCKING CONCENTRATE BINS, DESIGNED TO FIT DIRECTLY ONTO A SORTER’S CONCENTRATE OUTLET.

**FEED RATE SPECIFICATIONS:**

FOR PRIMARY FEED SORTER MODELS XR-2/50 DW & TSXR-2/50 DW and RE-CON MODELS XR-2/50 DW-rec & TSXR-2/50 DW-rec

Sorter feed rates “FR”, in kg/hr, are computed by using the following formulae:

$$FR (kg/h) = SC \times d (mm) \times SF \times sg.$$

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

**SC** = “SORTER CONSTANT” This value varies with sorter configuration and application. SC values for primary recovery applications vary from **150 to 600** and for re-concentration applications (REC sorter version) from **15 to 25**.

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

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

**Primary Recovery XR- or TSXR- machine feed rate with a SC of 150, fed with “NORMAL” shaped material (SF ± 0.6) with sg. ± 2.7. Sorter capacity (kg/hour) is approx. equal to FR ≈ 250 x d**

**Re-concentration XR- and TSXR- machine with a SC of 20, the feed rate (kg/hr) for “NORMAL” shaped material (SF ± 0.6) with sg. ± 2,7 is approx. equal to FR ≈ 32 x d**

**YIELD:** for both applications are::12 x FR x 10<sup>-6</sup> per ejection (0,0012% of FR)

# Flow electronics

LEADERS IN DIAMOND RECOVERY TECHNOLOGY

ESTABLISHED IN 1971

## 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 close to 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:

- [XR-GA-04.dwg](#) and [TSXR-GA-05.dwg](#)

TRANSPORT CRATE DIMENSIONS and WEIGHTS for **XR- SORTERS:**

Crate for control panel	1 off	1470mm long x 710mm wide x 790mm high x approximate weight 300kg
Crate for sorter	1 off	2580mm long x 1500mm wide x 1620mm high x approximate weight 700kg

TRANSPORT CRATE DIMENSIONS and WEIGHTS for **TSXR- SORTERS:**

Crate for control panels	2 off	1470mm long x 710mm wide x 790mm high x approximate combined weight 600kg.
Crate for sorters	2 off	2580mm long x 1500mm wide x 1620mm high x approximate combined weight 1400kg

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.



## **FLOW ELECTRONICS (PTY) LTD**

No 4 Engwena Road, Sebenza, Edenvale,  
1609, Johannesburg, South Africa

P O Box 366, Edenvale,  
1610, South Africa

Tel: +27 11 452 6006 / +27 11 452 6816

Fax: +27 11 609 4951

E-mail: [info@flow.co.za](mailto:info@flow.co.za)

[www.flow.co.za](http://www.flow.co.za)

DESIGN AND MANUFACTURE  
**Flow sort**<sup>™</sup>  
X-RAY DIAMOND RECOVERY EQUIPMENT