

# Flow electronics

LEADERS IN DIAMOND RECOVERY TECHNOLOGY

ESTABLISHED IN 1971

## **FLOW SORT™ X-RAY DIAMOND RECOVERY MACHINES**



## **TRAILER PLANT**

**OVER 620 SORTERS SOLD WORLD WIDE**



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## TECHNICAL SPECIFICATION

### FLOW SORT X-RAY DIAMOND RECOVERY TRAILER PLANT

**HIGHLY TRANSPORTABLE:** CAN BE MADE READY TO TRANSPORT OR SET-UP FOR OPERATION WITHIN 3 HOURS!

**PEACE OF MIND OPERATION:** CAN BE FITTED WITH A REMOTE SORTER / PLANT CONTROL AND MONITORING SYSTEM

FLOW X-RAY DIAMOND RECOVERY TRAILER PLANTS are specifically designed to sort WET (or DRY) diamondiferous material.

FLOW offers X-ray recovery trailer plants fitted with one **SINGLE STAGE MODEL** coded as **XR 2/50 DW**

Our TRAILER design follows the same robustness, reliability, high recovery efficiency, easy operation and low maintenance concept, as well as our uncompromising after sales service that earned our products acceptance in the market place.

Optionally FLOW X-RAY DIAMOND RECOVERY TRAILER PLANTS can be supplied with an integral diesel generator power-plant.

Emergency 12 Volt lights are standard on our trailer X-ray plants.

#### **EXTERNAL ELECTRIC SUPPLY SPECIFICATION:**

**Standard XR:** 230 Volt (+/- 10%), 50 Hz, Single Phase + Neutral, + Earth.  
Power consumption approx. 2kVA.

**General Trailer:** 230 Volt (+/- 10%), 50 Hz, Single Phase, Neutral, Earth.  
Power consumption approx. 4.5kVA.

Other Electrical Supply Specifications (Voltage, Frequency) can be accommodated on request.  
Lightning protection, surge and phase failure protection, are standard on all FLOW trailer plants.

#### **INTERNAL ELECTRIC SUPPLY (OPTIONAL):**

FLOW TRAILER PLANTS CAN BE SUPPLIED WITH a Single Phase, 5.5 kVA, Diesel Generator Set making the unit totally independent from any external power source.

#### **EXTERNAL WATER SUPPLY SPECIFICATION:**

**QUALITY:** Water supply must be filtered through a 100 Micron 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 PER XR:** Typically 15 litres / min. Water flow rate (volume) however varies depending on feed-rate, material size and type of material to be sorted.

#### **PARTIAL EXTERNAL WATER SUPPLY SPECIFICATION:**

FLOW trailer plants are fitted with an internal water re-circulation system designed to minimise water consumption of the trailer plant.

#### **OPERATING TEMPERATURE RANGE:**

MIN: +2.5°C      MAX: +45°C

RELATIVE HUMIDITY: 95% non-condensing

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## FEED MATERIAL SPECIFICATIONS:

### MODEL XR 2/50 DW

- Min SIZE for XR2/50DW:** There is no minimum size limit!  
Recommended minimum is **2mm**.
- Max SIZE for XR2/50DW:** Recommended maximum is **42mm**.  
*Absolute 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 OFFERS A PROFESSIONAL CONSULTING SERVICE TO ADVISE ON OPTIMAL SIZE SPLITS FOR SPECIFIC APPLICATIONS.

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

- 4 fractions:** + 2mm – 4mm, + 4mm – 10mm, + 10mm – 22mm, + 22mm – 42mm
- 3 fractions:** +2mm – 5mm, +5mm – 12mm, +12mm – 32mm

**FEED MATERIAL PRESENTED TO THE SORTER 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.**

**THE MATERIAL TO BE SORTED MUST BE APPROPRIATELY SIZED AND FREE OF UNDERSIZED AS WELL AS OVERSIZED MATERIAL.**

## FLOW CONCENTRATE BINS:

FLOW TRAILER PLANTS ARE SUPPLIED WITH 2 (TWO) SPECIAL HIGH SECURITY CONCENTRATE BINS (THAT FIT DIRECTLY ONTO THE SORTERS CONCENTRATE OUTLETS) PER SORTER STAGE.

## FEED RATE SPECIFICATIONS FOR PRIMARY FEED MODEL XR-2/50 DW

Sorter feed rate per hour “FR” is computed by using the following approximations:

For primary recovery:  $FR \text{ (in kg/h)} = 150 * d \text{ (in mm)} * SF * \text{s.g.}$

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

**150** = SORTER CONSTANT for primary recovery machines

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

**s.g.** = AVERAGE SPECIFIC GRAVITY OF FEED MATERIAL (g/cm<sup>3</sup>)

For a simplified “**RULE OF THUMB**” feed rate calculation for a Primary Recovery **XR-** or **TSXR-** machine (assuming “**NORMAL**” shaped material (**SF ± 0.6**) with a **s.g. of ± 2.7**) use:

**FR (kg/h) ≈ 230 \* d (mm).** I.e. **230 times the value of the average particle diameter (in mm)**

For example a sorter will handle 1150kg/h of material with an average specific gravity of 2.7 and an average particle size of 5mm.

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## YIELD:

### **YIELD of primary recovery machines:**

Each ejection produces concentrate equivalent to approximately **12 \* FR (kg/h) \* 10<sup>-6</sup>** or  
**0.0012% of FR (kg/h)**

If for example a sorter is treating 1000kg/h then each ejection will deflect approx. 12 gram of feed material (including the diamond that triggered the ejector) to concentrate.

## RECOVERY EFFICIENCY:

Theoretical diamond recovery efficiency figures depend on many factors such as feed rate, feed material particle size ratio and feed material temperature, cleanliness of feed material, colour, impurities and nitrogen content of diamonds etc.

In practice however with over 600 FLOW SORT machines operating around the world, we are proud to say, we have never encountered a case where actual diamond recovery efficiency of a properly set-up and maintained sorter was below 98 percent! When basing diamond recovery on value rather than number, diamond recovery efficiency figures run very close to 100 percent!

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

## DIMENSIONS OF FLOW TRAILER PLANT:

**TRANSPORT DIMENSIONS OF THE FLOW SORT TRAILER PLANTS ARE SABS APPROVED**

**Dimension: (L) 5200mm x (W) 2500mm x (H) 2800mm**

**NOTE: No additional packaging is required for shipping of a FLOW Trailer plant.**

## WEIGHT OF X-RAY TRAILER PLANT:

The weight of a FLOW X-RAY TRAILER PLANT varies greatly with plant configuration:

The "empty" trailer plant weighs in at about **300kg**

XR sorter fitted add: **750kg**

If fitted with a diesel generator-set add: **500kg**

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DESIGN AND MANUFACTURE

**Flow sort**<sup>TM</sup>

X-RAY DIAMOND RECOVERY EQUIPMENT