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XR\_TSXR\_SPEC\_071017\_25.DOC  
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DATE: 2005-05-15 UPDATE: 2007-10-20

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

### GENERAL

This diamond recovery machine, specifically designed to sort WET or DRY diamondiferous material, under virtually any conditions, is the “work-horse” in the FLOW SORT sorting machine stable.

Within 14 years of the sorters launch we have sold some 500 units to diamond mines all over the world. Our sorters are suitable for “fixed” installations and “mobile” installations as well as on board of “marine” diamond-mining vessels.

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.

We offer our sorters in two basic models. **SINGLE STAGE MODELS** coded as **XR 2/50 DW** and **TWIN-STAGE MODELS (double pass sorters)** referred to as **TSXR 2/50 DW**.

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

Both diamond recovery machine models can also be supplied (Configured) as re-concentration sorters (REC) designed to treat the concentrate of several primary sorter models.

### ELECTRIC SUPPLY SPECIFICATION:

**Standard XR:** 380 Volt (+/- 10%), 50 Hz, 3 Phase + Neutral, + Earth.

Power consumption approx. 3kVA.

**Standard TSXR:** 380 Volt (+/- 10%), 50 Hz, 3 Phase + Neutral, + Earth.

Power consumption approx. 4kVA.

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:** 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 XR-:** Typically 15 litres / min. Water flow rate (volume) however varies depending on feed-rate, material size and type of material to be sorted.

**Volume TSXR-:** Typically 25 litres / min. Water flow rate (volume) however varies depending on feed-rate, material size and type of material to be sorted.

### SORTER OPERATING TEMPERATURE RANGE:

**SORTER:** MIN: +2.5°C MAX: +45°C  
RELATIVE HUMIDITY: 95% non condensing

**CONTROL PANEL:** MIN: -5°C MAX: +45°C  
RELATIVE HUMIDITY: 95% non condensing

**FEED MATERIAL SPECIFICATIONS:**  
**MODELS XR 2/50 DW & TSXR 2/50 DW**

**Min SIZE for XR- & TSXR- 2/50DW:** There is no minimum size limit!  
Recommended minimum is **2mm**.

**Max SIZE for XR- & TSXR- 2/50DW:** 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 SORT OFFERS A PROFESSIONAL CONSULTING SERVICE TO ADVISE ON OPTIMAL SIZE SPLITS FOR SPECIFIC APPLICATIONS.**

**TYPICAL 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 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.**

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

**FLOW SORT CONCENTRATE BINS:**

**AS AN OPTIONAL EXTRA FLOW SORT SUPPLIES SPECIAL HIGH SECURITY CONCENTRATE BINS THAT FIT DIRECTLY ONTO THE SORTERS CONCENTRATE OUTLETS.**

**FEED RATE SPECIFICATIONS:**

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

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

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

**For re-concentration:**  $FR \text{ (in kg/h)} = 20 * d(\text{in mm}) * SF * \text{s.g.}$

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

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

**20 = SORTER CONSTANT for re-concentration 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>)**

**Primary Recovery XR- and TSXR- machine feed rate for “NORMAL” shaped material (SF ± 0.6) with s.g. ± 2.7. Sorter capacity (kg/hour) is approx equal to 230 times the value of d(mm)  $FR \approx 230 * d$**

**Re-concentration XR- and TSXR- machine feed rate for “NORMAL” shaped material (SF ± 0.6) with s.g. ± 2.7. Sorter capacity (kg/hour) is approx equal to 32 times the value of d(mm)  $FR \approx 32 * d$**

## YIELD:

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

The sorters produce concentrate equivalent to approximately **12x FRx10<sup>-6</sup>** per ejection  
**(0.0012% of FR)**

### **YIELD of re-concentration machines:**

The sorters produce concentrate equivalent to approximately **12x FRx10<sup>-6</sup>** per ejection  
**(0.0012% of FR)**

## 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 ect.

In practice however with close to 500 FLOW SORT machines operating around the world, we are proud to say, that we 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 SORT OFFERS A DIAMOND FLUORESCENCE 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:  
**XR-GA-04.dwg** and **TSXR-GA-04.dwg** respectively. Available on request.

### **TRANSPORT CRATE DIMENSIONS AND WEIGHTS FOR XR-DW SORTERS:**

Crate for sorter	1 off	500mm long x 800mm wide x 1650mm high x 600kg.
Crate for control panel	1 off	1400mm long x 690mm wide x 550mm high x 100kg

### **TRANSPORT CRATE DIMENSIONS AND WEIGHTS FOR TSXR-DW SORTERS:**

Crate for sorter	2 off	500mm long x 800mm wide x 1650mm high x 600kg.
Crate for control panel	2 off	1400mm long x 690mm wide x 550mm high x 100kg

**FLOW SORT (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 SORT (PTY) LTD**

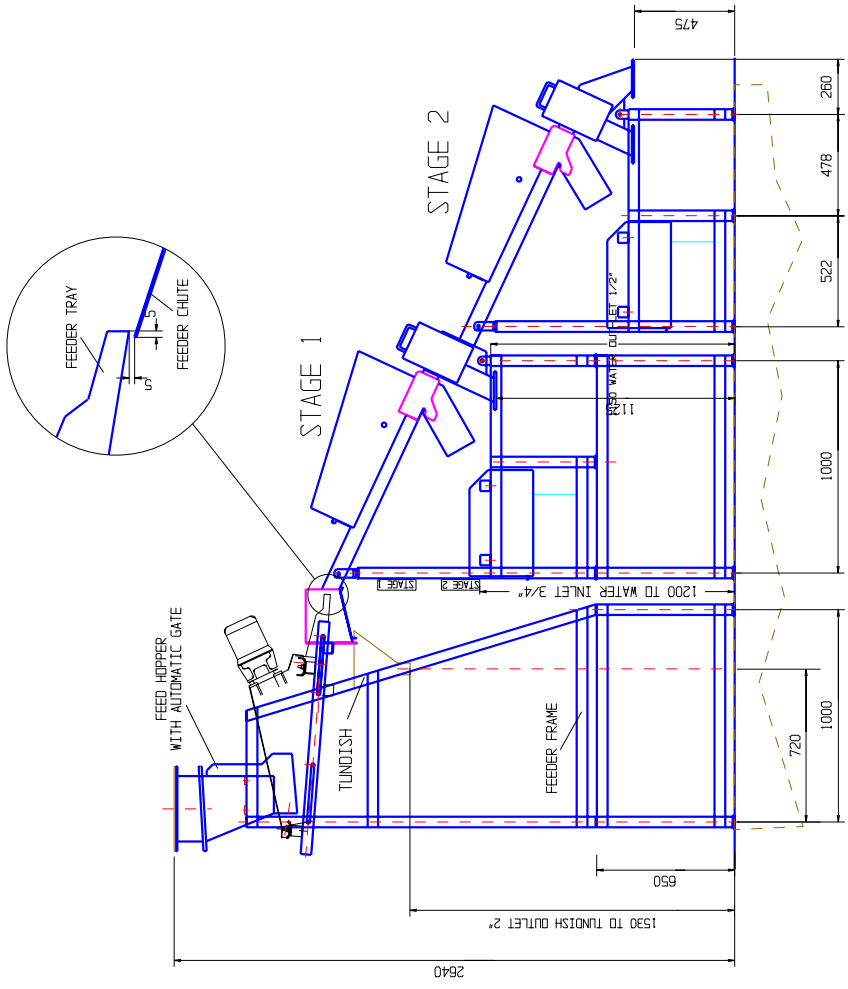
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E-mail: [sales@flow.co.za](mailto:sales@flow.co.za)  
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**Flow Sort**

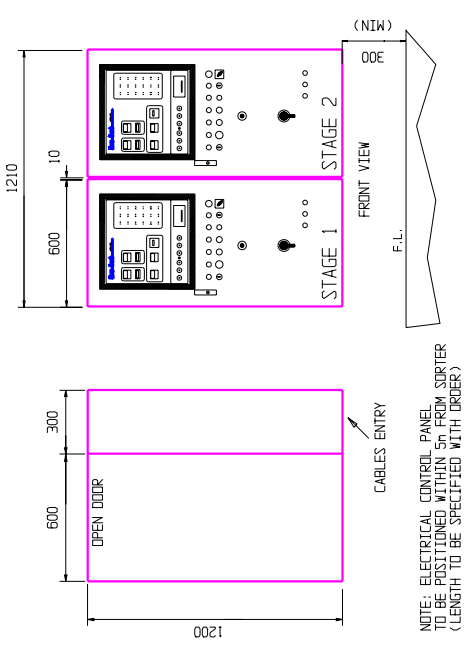
**LEADERS IN DIAMOND RECOVERY TECHNOLOGY**



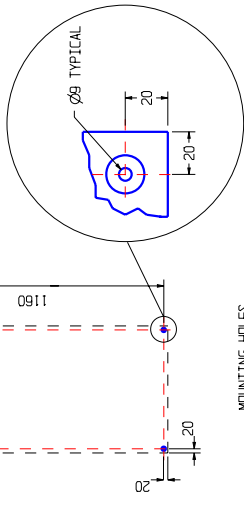
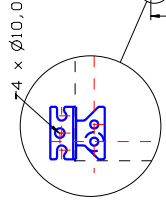
FEEDER DISCHARGE ALIGNMENT



CONTROL PANEL

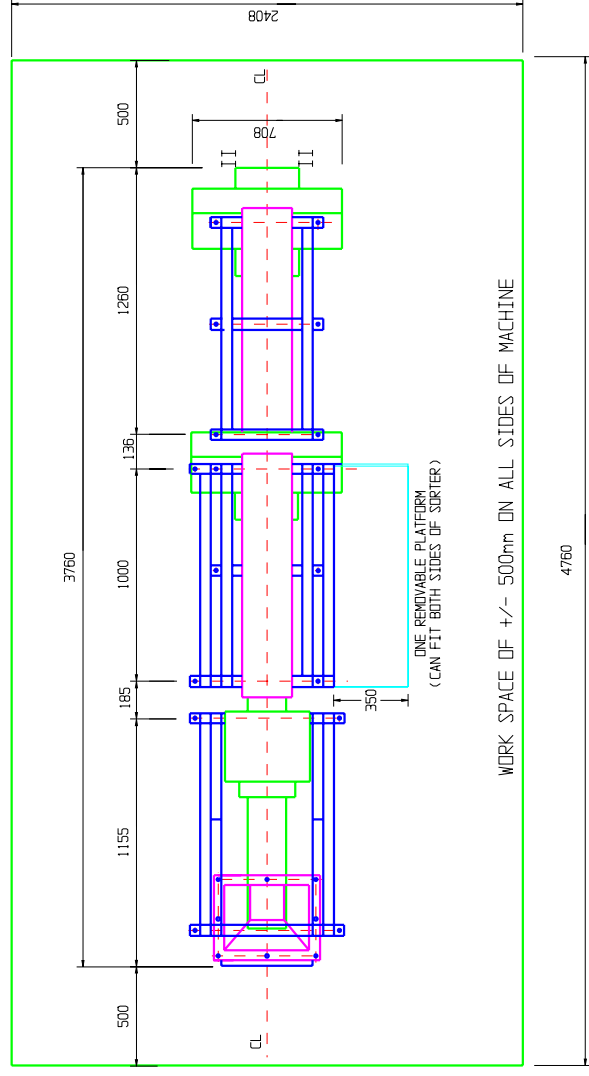


NOTE: ELECTRICAL CONTROL PANEL TO BE POSITIONED WITHIN 5m FROM SORTER (LENGTH TO BE SPECIFIED WITH ORDER)

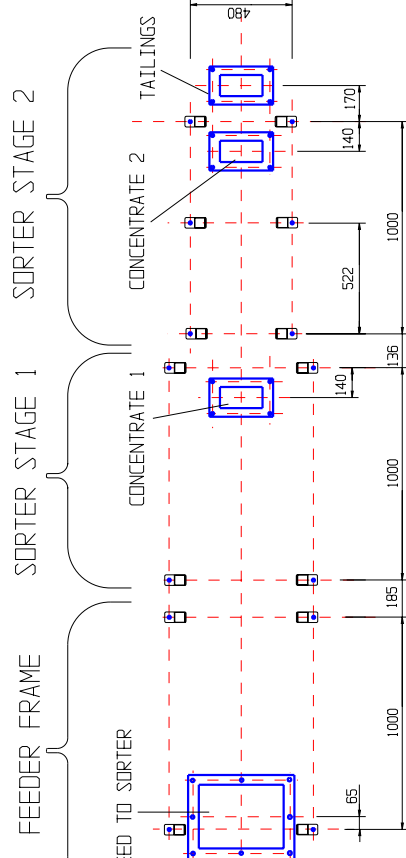


MOUNTING HOLES USING EXTERNAL MOUNTING BRACKETS FITTED TO REAR PANEL (OPTIONAL)

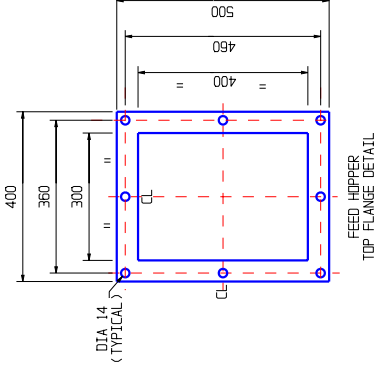
MOUNTING HOLES REAR PANEL (TYPICAL)



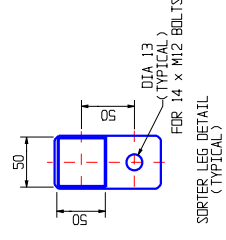
WORK SPACE OF +/- 500mm ON ALL SIDES OF MACHINE



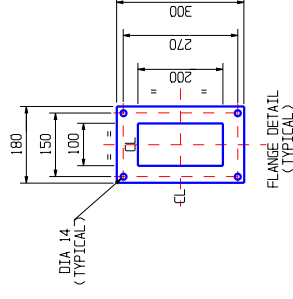
H.B. BOLT PLAN & INLET & OUTLETS



FEED HOPPER TOP FLANGE DETAIL



SORTER LEG DETAIL FOR 14 x M12 BOLTS



FLANGE DETAIL

NOTE: FOR ELECTRIC SUPPLY, WATER SUPPLY, WEIGHT OF SORTER, ETC... REFER TO FLOW SORT'S SPECIFIC SORTER SPECIFICATIONS

ITEM	QTY	DRAWING #	DESCRIPTION	MATERIAL	REMARKS
		SCALE: N.T.S.			
		DATE: 00/09/13			
		DRAWN BY: CW			
		APPROVED BY:			
		ART			
		CW			
		N.B.A.			
		DATE			
		INT.			
		REVISION			

GENERAL ARRANGEMENTS OF  
TSXR 2/19DW & TSXR 15/35DW  
WITH FEED ARRANGEMENT

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TSXR\_GA\_04.DWG

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