

INSTRUCTIONS FOR THE LOCATION, INSTALLATION,
ADJUSTMENT AND USE OF STANTON PRECISION
BALANCES - MODELS CL4D AND CL5D

IMPORTANT

PLEASE READ TO THE END OF EACH PARAGRAPH
BEFORE ATTEMPTING TO CARRY OUT THE OPERATIONS
DESCRIBED.

LOCATION

STANTON BALANCES ARE BEST LOCATED AWAY
FROM SUNLIGHT. AVOID ALSO DRAUGHTY ROOMS AND
SITES WHERE RAPIDLY CHANGING TEMPERATURES WOULD
MAKE GOOD RESULTS IMPOSSIBLE. THE SITE SHOULD
BE DRY, BUT CLOSE PROXIMITY TO RADIATORS, TUBULAR
HEATERS AND THE LIKE SHOULD BE AVOIDED.

REMEMBER THAT A HIGH DEGREE OF FREEDOM FROM
VIBRATION IS DESIRABLE TO TAKE ADVANTAGE OF THE
FULL SENSITIVITY AND GIVE LONG KNIFE EDGE LIFE.
A 2 AMP. AC ELECTRICAL POINT IS REQUIRED WITHIN
SIX FEET (180 CM) OF THE INSTRUMENT.

BEFORE ASSEMBLY NOTE THAT THE BALANCE HAS BEEN PACKED WITH THE FRONT SLIDE OF THE WEIGHING COMPARTMENT IN THE 'UP' POSITION. AT ALL TIMES IT IS IMPORTANT TO MAKE SURE THAT THE FRONT SLIDE IS IN THE 'UP' POSITION WHEN THE CASE IS REMOVED. DO NOT APPLY UNDUE PRESSURE, OR GRIP THE INSTRUMENT BY THE FRONT SLIDE.

INSTALLATION.

REMOVE THE LID.

RELEASE THE CASE BY THE CATCH LOCATED BY EACH ACTION LEVER. WITHDRAW EACH CATCH TO ITS LIMIT. NOW LIFT THE CASE VERTICALLY 24" (50CM) UNTIL IT CLEARS THE MAIN STAND, AND THEN REMOVE.

GENERALLY CLEAN THE INTERIOR OF THE INSTRUMENT AND THE PERMANENT SUPPORTING STRUCTURE WITH CHAMOIS LEATHER AND A CAMEL HAIR BRUSH. TAKE CARE NOT TO DAMAGE THE WEIGHT LOADING HOOKS, DAMPING CYLINDERS AND MIRRORS ETC.

UNWRAP THE COMPONENT PARTS CAREFULLY AND HANDLE THE BEAM AT ALL TIMES WITH EXTREME CARE.

TAKE THE BEAM, REMOVE ALL DUST FROM THE KNIFE EDGE FIXTURES, GRATICULE AND COUNTERPOISE WEIGHT WITH A CAMEL HAIR BRUSH AND WIPE THE KNIFE EDGES AND AGATE LOCATIONS WITH A CHAMOIS LEATHER. EXTRA CARE SHOULD BE TAKEN NOT TO DISTORT ANY ATTACHMENTS TO THE BEAM WHILE HANDLING; CHECK ALSO THAT THE COUNTERPOISE WEIGHT (WHICH OPERATES AS THE DAMPING PISTON) AND CYLINDER ARE FREE FROM HAIRS AND DUST. SIMILARLY CLEAN THE LOCATION POINTS ON THE BEAM SUPPORT AND MAIN PLANE WITH CHAMOIS LEATHER. USE AN EYEGLASS TO MAKE SURE THAT ALL THESE PARTS ARE REALLY CLEAN AND FREE FROM GREASE OR MOISTURE.

CHECK THAT THE ARRESTMENT IS IN THE 'UP' POSITION BY ROTATING EITHER ACTION LEVER BACK TO THE DEFINITE STOP AND THEN SLIGHTLY FORWARD AGAIN UNTIL IT IS FELT TO LOCATE IN A POSITIVE NOTCH. THE MOVEMENT OF THE BEAM SUPPORT BAR CAN BE SEEN AND MAY BE OBSERVED TO ARRIVE IN THE 'UP' POSITION DURING THESE OPERATIONS. THE DETAILED USE OF THE PARTIAL AND FULL RELEASE DURING WEIGHING IS EXPLAINED LATER. HOLD THE BEAM ASSEMBLY BETWEEN THE CENTRE AND THE COUNTERPOISE WEIGHT. THE POINTER SHOULD FACE THE OPERATOR; RAISE THE BEAM SO THAT THE GRATICULE IS CLEAR OF THE WEIGHT LOADING HOOKS TO THE RIGHT OF THE STAND TO ALLOW THE POINTER TO PASS BETWEEN THE WEIGHT LOADING ARMS AND THEIR PIVOT BAR. WHEN THE GRATICULE IS BEYOND THIS POINT THE BEAM SHOULD BE ROTATED TO AN APPROXIMATE POSITION OVER ITS ARRESTMENT. FEED THE BEAM INTO POSITION ON TO ITS LOCATION POINTS TAKING CARE NOT TO KNOCK THE GRATICULE. USE BOTH HANDS TO GUIDE THE BEAM INTO ITS FINAL POSITION. THESE OPERATIONS MUST BE PERFORMED WITH GREAT CARE SINCE IT IS IMPERATIVE THAT THE CENTRE KNIFE IS NOT PLACED DIRECTLY ON THE CENTRE PLANE, OR PERMANENT DAMAGE MAY RESULT.

CHECK THAT ALL WEIGHT LOADING SCALS ARE SET TO ZERO. THE ZERO MARKER ON THE SCAL CORRESPONDS TO THE DOUBLE INDICATOR ON THE SCALE.

THE WEIGHTS ARE PACKED IN BOXES MARKED TOP AND BOTTOM ROW FOLLOWED BY A NUMBER. THESE NUMBERS REPRESENT THE FINAL ORDER OF POSITION WHICH THE WEIGHTS ARE TO OCCUPY ON THE INSTRUMENT IN THE ROW CONCERNED.

PLACE THE BOTTOM WEIGHTS DIRECTLY ON THEIR APPROPRIATE HOOKS AS SHOWN IN FIGURE 2, NO. 1, A 5 G. RING WEIGHT IS PLACED ON THE HOOK NEAREST TO THE WEIGHT LOADING KNOBS. TO PLACE WEIGHTS NO'S. 2 TO 8 INCLUSIVE, THE ARM CARRYING THE WEIGHT TO BE PLACED SHOULD BE RAISED BY GENTLE UPWARD PRESSURE ON ITS BOTTOM EDGE. IT SHOULD BE NOTED THAT THE BOTTOM WEIGHTS INCLUDE SEVERAL PAIRS. THE EXCEPTION NO. 5 A 10 G. WEIGHT WHICH IS UNMARKED. NUMBERS 4 AND 6 ARE MARKED WITH A SINGLE DOT TO DISTINGUISH THEM FROM NO. 5 AND TOGETHER CONSTITUTE A PAIR. THE 5 G. WEIGHTS 1 AND 9 ARE MARKED WITH ONE GROOVE. NO'S. 2 AND 8 ARE MARKED WITH TWO GROOVES TO DISTINGUISH THEM FROM THE 5 G. WEIGHT NO. 6 ON THE TOP BANK WHICH IS UNMARKED. THE 10 G. WEIGHTS 3 AND 7 ARE UNMARKED AND TOGETHER, CONSTITUTE A PAIR. (A MODEL CL50 WEIGHTS NOS. 4 AND 6 ARE OMITTED.

The paired weights are together adjusted within N.P.L. tolerances. The varying denominations prevent further interchange without obvious error, but, whenever the weights are removed from the balance, care must be taken to ensure that each one is returned to its original hook.

Now set the weight loading dials to read 99.9 for the CL5D and 199 for the CL4D so that all the hooks are in the 'up' position. Next, assemble the top bank of weights. The first weights to be placed are the 0.1g. or the 100mg (No's. 1 and 2) followed by the 0.2g. (No.3) and the 0.5g. (No.4). Continue with the gramme weights by engaging first the 2g. (No.5) and the 5g. (No.6). Add the first 1g. (No.7) and finally the second 1g. (No.8) weight. On model CL4D the top bank commences with the 2g. weight, the weight series and boxes are numbered 1 to 4 only.

Thoroughly clean the stirrup attached to the weight carrier frame paying special attention to the surface of the bearing plane. Take extra care not to distort the frame while handling. Hold the frame with the left hand so that the open side of the pan hook faces the operator. Turn the small retaining clip 'W' that secures the bottom weight carrier car assembly in its location. Then ease the carrier from its location and allow it to hang on the base of the frame. Remove the top carrier in the same way (See figure one).

Now hold the stirrup body with the left hand and the two weight carrier bar assemblies with the right hand. Locate the stirrup on its location points, and rest the weight carrier assemblies on the pan chamber roof (Figure two).

Now withdraw the top weight carrier assembly until the block with the slot facing outwards is against the frame (Figure three). Then feed the assembly back through the rings of the weights; engage the slots in their locations on the frame. Return the retaining clip 'A' to secure the assembly. Replace the bottom assembly in the same way (Figure four).

Check that all the weights are correctly placed by reference to the figure on the appropriate coloured counter, and then reset the weight loading dials to zero.

Insert the pan stop and attach the pan to the hook protruding through the roof of the pan chamber. The open side of the small hook should face the operator.

Level the balance and adjust the pan stop to lightly touch the underside of the pan

An AC mains voltage selector is fitted at the rear base of the instrument. To set the selector use a small coin, depress the knob slightly and turn to the required voltage. A lamp fuse is incorporated in the selector; this can be removed by turning the selector until the arrow is opposite the slot.

Connect the mains lead to a suitable AC supply. Connect the red wire to live, black to neutral and bond the green wire to an efficient earth or ground. Attach the lead to the balance by means of the round three-pin plug. A mains switch is also incorporated in this panel. A spare fuse and lamp are supplied with the instrument.

Turn the action lever $1/8$ " in either direction and this will operate the concealed switch to energise the lamp; the graticule should now show a clear image on the screen. The optical system has been set before leaving the factory, but it may be necessary to adjust the position of the lamp to give maximum illumination. To focus the graticule (B) when necessary rotate lens adjuster wheel (C) until a clearly defined image is obtained. Turn the digital knob clockwise to its stop so that the digits on the right of the screen should read "00". If the pointer has been jarred in transit it may be necessary to ease the pointer by gentle pressure applied half-way down its length to return the graticule to its correct position. Remove the beam during any such operation.

Finally replace the case and lid taking great care not to disturb the beam.

ADJUSTMENT.

ALLOW THE BALANCE TO SETTLE FOR AT LEAST THREE HOURS IN AN EVEN TEMPERATURE.

CHECK THE LEVEL. RELEASE THE BEAM AND OBTAIN A FEW CHECK READINGS, IF THE GRATICULE ZERO DOES NOT INDICATE TRUE ZERO AND THE ERROR EXCEEDS THE ADJUSTMENT COVERED BY THE ZEROIZER KNOB ON THE RIGHT HAND SIDE OF BALANCE CORRECT THE POISE BY ADJUSTING EITHER OF THE HORIZONTAL POISE RUNNERS SITUATED AT THE LEFT CENTRE OF THE BEAM, IN THE CASE OF THE Q150 THE SMALLER OF THE TWO POISE RUNNERS SHOULD BE USED. REPLACE THE LID.

WHEN CORRECTLY POISED, CHECK THE SENSITIVITY BY PLACING ON THE PAN A STANDARD WEIGHT OF DENOMINATION EQUAL TO THE FULL SCALE DEFLECTION OF THE GRATICULE. FULLY RELEASE THE BEAM BY TURNING EITHER ACTION LEVER AWAY FROM THE OPERATOR (GREEN LIGHT ON PANEL) AND OBSERVE THE FULL SCALE READING. IF THE READING FALLS SHORT OF THE TRUE WEIGHT PLACED, RAISE THE CENTRAL GRAVITY WEIGHT SLIGHTLY - IF THE READING EXCEEDS THE TRUE WEIGHT, THEN LOWER THE WEIGHT. AFTER EACH AND EVERY ADJUSTMENT OF THE GRAVITY WEIGHT REPOISE THE BALANCE. DURING ALL ADJUSTMENTS MAKE SURE THAT THE BEAM IS ARRESTED AND SUPPORT IT BY GENTLE PRESSURE ON ITS TOP EDGE WHILST TURNING THE GRAVITY WEIGHT OR END RUNNERS. ALLOW AT LEAST ONE HOUR FOR THE INSTRUMENT TO SETTLE BEFORE MAKING FINAL ADJUSTMENT.

TARE DEVICE (FOR THE Q140 ONLY).

A TARE WEIGHT ADJUSTABLE OVER THE RANGE 0-90g. IS SUPPLIED. IT CONSISTS OF A SMALL ALUMINIUM CONTAINER WHICH SHOULD BE ADJUSTED WITH SHOT AND ALUMINIUM WIRE.

TO USE, FIRST CHECK THAT THE BALANCE IS ARRESTED AND THEN PLACE THE COMPLETE CONTAINER AND THE VESSEL TO BE TARED TOGETHER ON THE PAN. TURN THE GREY WEIGHT LOADING KNOB UNTIL THE RED 'T' APPEARS IN THE FIRST COUNTER WINDOW.

ADD SHOT TO THE CONTAINER UNTIL THE POISE IS OBTAINED WITH THE RANGE OF THE ZERO ADJUSTMENT. IF SEVERAL TARES ARE BEING PREPARED FOR SIMILAR WORK THEN IT MAY BE ADVANTAGEOUS TO USE ALUMINIUM WIRE TO OBTAIN THE SAME ZERO WITH EACH EQUIVALENT VESSEL. REPLACE THE LID OF THE TARE AND IDENTIFY WITH ITS APPROPRIATE VESSEL. SPEED OF TARING WILL BE ATTAINED IF IT IS APPRECIATED THAT THE ADJUSTED TARE AND VESSEL TOGETHER FINALLY WEIGH 100g.

IN USE THE TARE IS NORMALLY HUNG ON THE PAN WIRE HOOK AND THE APPROPRIATE VESSEL IS PLACED ON THE PAN, WHILST THE RED 'T' MUST ALWAYS SHOW IN THE FIRST WINDOW. ADJUST ZERO.

WEIGH THE CHARGE INTO THE VESSEL IN THE USUAL WAY USING THE REMAINDER OF THE WEIGHT LOADING MECHANISM, BUT DO NOT EXCEED THE NET RANGE OF 100g. OR MOVE THE 100g DIAL FROM THE 'T' POSITION. THE FINAL READING OF THE REMAINING DIALS AND GRATICULE INDICATES THE ACTUAL WEIGHT OF THE MATERIAL IN THE TARED VESSELS.

A NUMBER OF VESSELS HAVING THE SAME WEIGHT WITHIN THE RANGE OF THE BALANCE ZERO ADJUSTMENT MAY BE USED AGAINST THE SAME TARE, PROVIDED THAT THE ZERO IS RESET AS EACH VESSEL IS USED.

WE HAVE STRIVEN TO MAKE THE BALANCE AS PERFECT AS POSSIBLE AND AS ROBUST AS A SENSITIVE INSTRUMENT CAN BE. OBSERVATION OF THE FOLLOW POINTS WILL HELP TO KEEP THE BALANCE WORKING SMOOTHLY AND EFFICIENTLY.

A. WEIGHING INSTRUCTIONS.

1. CHECK THE LEVEL OF THE BALANCE, ALSO THAT THE PAN IS EMPTY AND CLOSE THE FRONT SLIDE. CHECK THAT ALL FIGURES ARE AT "0".
2. TURN ACTION LEVER TO FULL RELEASE (AWAY FROM THE OPERATOR).
3. TURN ZEROIZER KNOB ON RIGHT HAND SIDE UNTIL THE SCALE ZERO LINE IS CENTRAL IN THE FORK.
4. ARREST THE BALANCE AND THEN TURN TO FULL RELEASE ONCE MORE. CHECK THAT THE FORK AGAIN COINCIDES WITH THE ZERO LINE OF THE SCALE. IF IT FAILS TO DO SO REPEAT THE OPERATION OF PARAGRAPH 3. THEN RETURN THE ACTION LEVER TO THE ARRESTED POSITION (VERTICAL).
5. PLACE OBJECT TO BE WEIGHED ON THE PAN. CLOSE THE FRONT SLIDE.
6. TURN THE ACTION LEVER TO PARTIAL RELEASE (TOWARDS OPERATOR).
7. TURN THE RED WEIGHT LOADING KNOB (TENS) AWAY FROM OPERATOR ONE CLICK AT A TIME AND OBSERVE THE SCREEN. WHEN THE GRATICULE MOVES DOWN THE SCREEN, TURN RED KNOB BACK TOWARDS OPERATOR ONE CLICK AND PROCEED IN A SIMILAR WAY WITH THE YELLOW (AND BLUE FOR THE Q5D) KNOBS IN TURN.
8. WHEN WITHIN GRATICULE RANGE TURN THE ACTION LEVER AWAY FROM OPERATOR TO THE FULL RELEASE POSITION.
IF THE OBJECT TO BE WEIGHED IS OBVIOUSLY LESS THAN TEN GRAMMES IN WEIGHT, IT WILL SAVE TIME TO START WITH THE YELLOW KNOB.
9. TURN THE MICROMETER KNOB CLOCKWISE UNTIL THE FORK (WHICH WILL MOVE UPWARDS) COINCIDES WITH A LINE ON THE GRATICULE. THE KNOB SHOULD BE TURNED SLOWLY TO APPROACH THE FINAL POSITION AND OVERSHOOTING SHOULD BE AVOIDED. IF IT WILL BE FOUND THAT THERE IS ONLY ONE LINE WITHIN THE RANGE OF TRAVEL OF THE MICROMETER; IT IS NOT POSSIBLE TO CHOOSE THE WRONG ONE.
10. READ OFF THE WEIGHT.
Q4D. HUNDREDS, TENS AND UNITS ARE INDICATED ON THE WEIGHT LOADING DIALS, THE FIRST AND SECOND PLACES ARE READ FROM THE GRATICULE WHILST THE FINAL TWO PLACES ARE INDICATED BY THE MICROMETER DIGITS.
Q5D. TENS, UNITS AND THE FIRST PLACE ARE INDICATED ON THE WEIGHT LOADING DIALS, THE SECOND AND THIRD PLACES ARE READ FROM THE GRATICULE WHILST THE FINAL ~~TWO~~ PLACES ARE INDICATED BY THE MICROMETER DIGITS.
11. RETURN THE ACTION LEVER TO THE VERTICAL POSITION AND THE WEIGHT LOADING DIALS AND THE MICROMETER TO ZERO. REMOVE THE OBJECT FROM THE PAN.

- B. TAKE CARE TO AVOID KNOCKING THE INSTRUMENT, DO NOT OPEN THE FRONT SLIDE WHILST THE ACTION LEVER IS RELEASED AND IN PARTICULAR DO NOT LOAD OR UNLOAD THE PAN WHEN THE ACTION LEVER IS IN THE FULL OR PARTIAL RELEASE POSITION.

- C. THE BALANCE SHOULD BE 'SET OFF' SMOOTHLY AND ANY TENDENCY TO 'DRAG' DOWN SHOULD BE CORRECTED. USUALLY THIS IS DUE TO FOREIGN MATTER IN THE STIRRUP LOCATIONS OR ON THE POINTS SUPPORTING THEM, CLEAN WITH CHAMOIS LEATHER. ALTERNATIVELY, THIS TROUBLE MIGHT BE DUE TO INCORRECTLY ADJUSTED PAN STOPS.
- D. LACK OF REPRODUCIBILITY IS OFTEN CAUSED BY DUST OR GREASE ON THE KNIFE EDGES OR PLANES. USE AN EYEGLASS FOR THOROUGH SCRUTINY AND CLEAN WITH A SOFT CHAMOIS LEATHER.
- E. WE ARE ANXIOUS FOR THE BALANCE TO GIVE COMPLETE SATISFACTION AND WE ARE PREPARED TO DO EVERYTHING POSSIBLE TO ENSURE THIS. PLEASE WRITE DIRECT TO US IF ADVICE IS NEEDED OR IF YOU CAN OFFER COMMENT - COMPLIMENTARY OR OTHERWISE. WE ARE JUSTLY PROUD OF OUR SERVICE AND SHALL DO OUR BEST TO GIVE ASSISTANCE AT ALL TIMES.

REPLACEMENT PROJECTION LAMPS.

PROJECTION LAMPS USED IN THE CL4D AND CL5D BALANCES ARE LUCAS No. 319 STOP TRANS v 18w BA 15D/19. WE HAVE THESE AVAILABLE SHOULD REPLACEMENTS BE REQUIRED.

STANTON INSTRUMENTS LIMITED.

COPPER MILL LANE, LONDON, S.W.17.

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MARCH, 1967.

WEIGHT LOADING ASSEMBLY DIAGRAM.

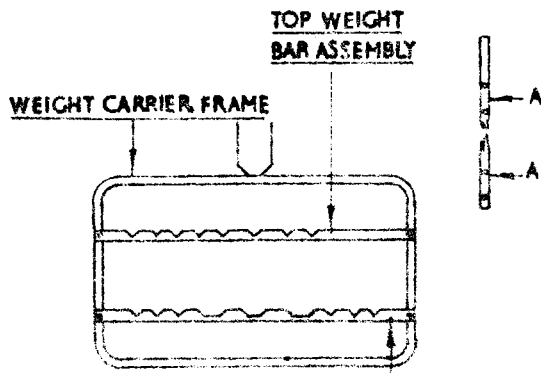


FIGURE-1

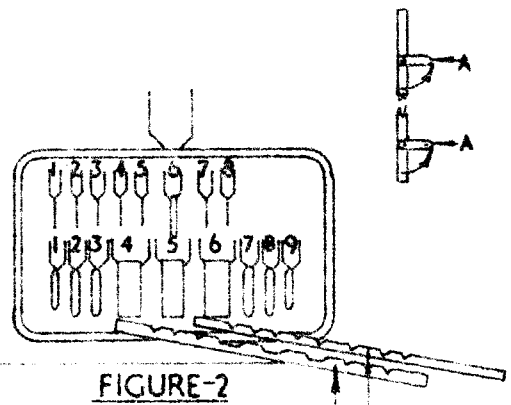


FIGURE-2

TOP & BOTTOM WEIGHT BAR ASSEMBLIES
LOWERED ON TO PAN CHAMBER ROOF

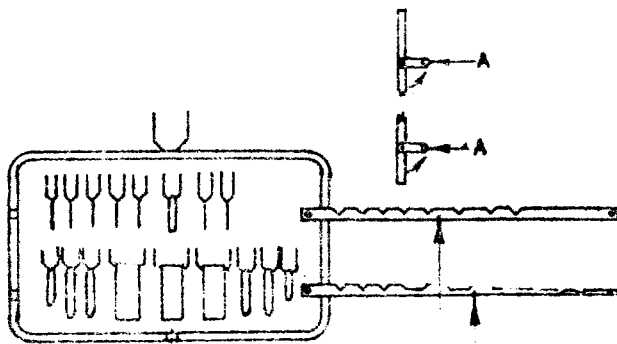


FIGURE-3

TOP & BOTTOM WEIGHT
BAR ASSEMBLIES WITHDRAWN

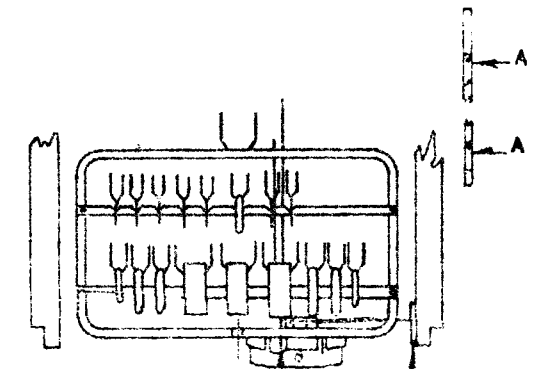


FIGURE-4

B-GRATICULE

C-FOCUSING WHEEL

TOP & BOTTOM WEIGHT BAR ASSEMBLIES IN
FINAL POSITION RETAINED BY SPRING CLIP^{2,3}
POSITIONED IN THE DIMPLE

WEIGHT DENOMINATIONS.

TOP BANK HOOKS.

MODEL	1	2	3	4	5	6	7	8	9	
CL4D, CLX4D CL42 SN1 SN3					2	5	1	1		Gramme
CL41 CLX4 CL5D HCL5D	0.1	0.1	0.2	0.5	2	5	1	1		Gramme
TSN3D	0.2	0.2	0.4	1	4	10	2	2		Gramme

BOTTOM BANK HOOKS.

	1	2	3	4	5	6	7	8	9	
CL4D, CLX4D CL42 CL41 CLX4 SN1 SN3	5-	5=	10	50-	50	50-	10	5=	5-	Gramme
CL5D	5-	5=	10	-	50	-	10	5=	5-	Gramme
HCL5D	5-	5=	10	-	-	-	10	5=	5-	Gramme
TSN3D, SN3D	5	5-	10-	50-	50	50-	10-	5-	5	Gramme