To Cover

SECTION 4 ADJUSTMENT

SECTION 4 ADJUSTMENT

4.1 STANDARD SENSITIVITY ADJUSTMENT

4.1.1 WBC and RBC Sensitivity Adjustment

Required reagent: CELLCHECK-400; Part No. 814-0022-6

(1) Verify that the temperature of CELLPACK and the room temperature is within the range of 15 – 30°C.

(2) Access to the Maintenance mode.

(3) Press the Start Switch and verify WBC and RBC background counts fall the range below:
WBC background value $\leq 0.30 \times 10^3/\mu L$
RBC background value $\leq 0.02 \times 10^6/\mu L$

(4) Select 9. Service from SELECT menu.
Select 2. Service Seq. and 3. Gain Adjustment from the submenu.

(5) From the Gain Adjustment menu, select 1: WBC/RBC. The WBC/RBC Gain Adjustment screen will appear.

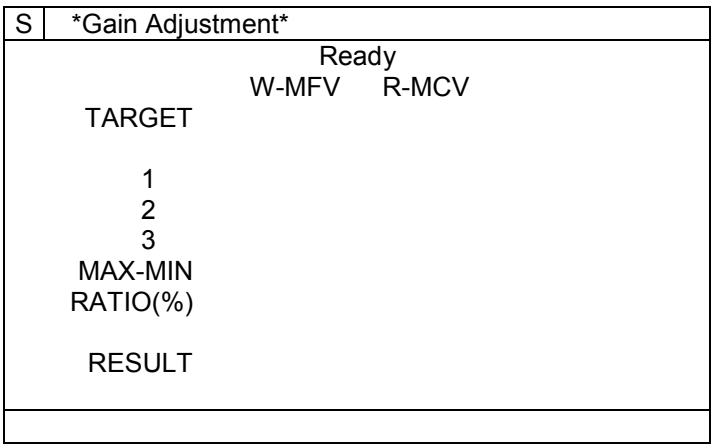


Figure 4-1: WBC/RBC Gain Adjustment Display

"*Gain Adjustment*" will appear in the system status area.
The data processing area includes following items:

TARGET: Area for entering the target value
1, 2 and 3: Area that displays the 3 analysis values
MAX-MIN: Area that displays the difference between the maximum and minimum of the 3 analysis values
RATIO(%): Area that displays the calculated compensation ratio
RESULT: Area that displays the analysis values after they are compensated

(6) Enter the TARGET values using the numeric and decimal keys.
When the Gain Adjustment screen is opened, the area in which you enter the W-MFV target values will be reversed. Input the W-MFV and R-MCV TARGET values calculated as below:

Table 4-1: Sensitivity Adjustment Target Values *9 11*

Parameter	Target Value	CELLCHECK-400 Lot No.
W-MFV	172.0+/-3.0 fL	A5023 and thereafter
R-MCV	1.26 x (Assay value MCV of CELLCHECK-400/CC-108)	- - -

The acceptable range for each parameter is 0.0 to 999.9. If the input range is exceeded, an alarm will sound and the data entry is ignored.
For each parameter, numerals that are not significant digits will be cut off. For example, if the WBC target is entered as 172.05, the set value will be 172.0.
[C] key functions as backspace to delete one character.
If a target value has already been entered, the previous value will be deleted upon any key entry.

(7) To confirm, either press the [ENTER] key or move to the next item with the [→] and [←] keys. If you press the [ENTER] key, the reverse display will shift to the right.

(8) Press the [SELECT] key. The confirmation message will appear.

Confirm Data?	Cont.	Set	Cancel

Figure 4-2: Gain Adjustment Confirmation Message

If you select [Cont.], you can continue to enter target values.
If you select [Set], the target value will be confirmed and the sample will be ready for analysis.
If you select [Cancel], gain adjustment processing will be canceled and the system will return to the Ready Screen.

(9) Open the Detector Cover by loosening the fixing screw.

(10) Mix CELLCHECK-400 ampules vigorously, and pour it into the DB-1 sample beaker.

(11) Pour approx. 3.5 mL of CELLCHECK-400 into the WBC transducer chamber and approx. 2.5 mL into the RBC transducer chamber.

(12) Close the Detector Cover, and press the Start Switch.
The recount analysis sequence will be performed automatically three times and the three analysis values (1 to 3), difference between the maximum and minimum (MAX-MIN), and compensation ratio (RATIO%) will be calculated.

S *Gain Adjustment* ▷ ▷ ▷ ▷ ▷ ▷

Ready

	W-MFV	R-MCV
TARGET	172.0	134.8
1	173.5	132.8
2	175.5	131.8
3	174.5	132.3
MAX-MIN	2.0	1.0
RATIO(%)	98.6	101.9
RESULT	172.0	134.8

Execute Settings? Yes No

Figure 4-3: WBC/RBC Gain Adjustment Display

(13) Analysis is performed once again and displays the analysis values (RESULT).
Verify that the followings are all satisfied. (W-MFV, R-MCV)

- MAX-MIN ≤ 4 [fL]
- RATIO (%) - 100±50
- RESULT = TARGET±2 [fL]

4 Following Procedures are for Version 00-15 and before:

(14) Follow the procedures below according to the analysis values (RESULT):
1) When all the analysis values (RESULT) satisfy the values of step (13), execute the step (15).
2) When the analysis values (MAX-MIN value and RATIO value), other than RESULT value, are satisfied, move on to the step (16) and the following steps.
3) When the analysis values (MAX-MIN value and RATIO value), other than RESULT value, are not satisfied, go back to the step (1) and perform the sensitivity adjustment once again.

(15) Select [Yes] and press the [ENTER] key. The gain adjustment value will be updated and the system will return to the Ready Screen. If the built-in printer is connected, the fourth analysis values and compensation ratio will be printed.

(16) To use RESULT value for the compensation, keep it.

(17) Select [No] and press the [ENTER] key to leave from the Gain Adjustment menu. The system will return to the Ready Screen.

(18) Press the Start Switch and verify WBC and RBC background count fall the range below:
WBC background value $\leq 0.30 \times 10^3/\mu L$
RBC background value $\leq 0.02 \times 10^6/\mu L$

(19) Select 9. Service from SELECT menu.
Select 2. Service Seq. and 3. Gain Adjustment from the submenu.

(20) From the Gain Adjustment menu, select 1: WBC/RBC. The WBC/RBC Gain Adjustment screen will appear.

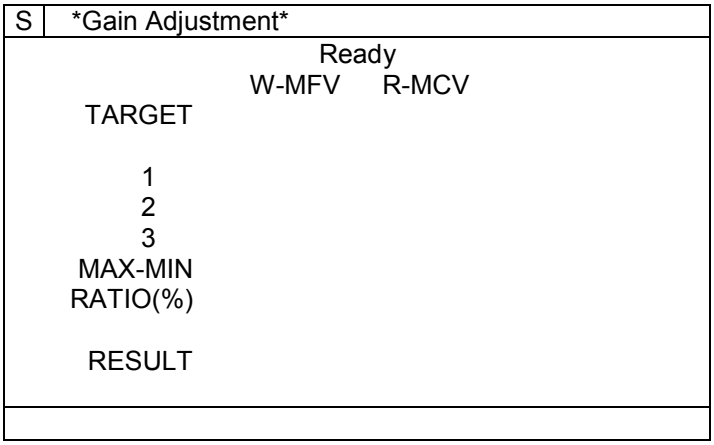


Figure 4-1: WBC/RBC Gain Adjustment Display

"*Gain Adjustment*" will appear in the system status area.
The data processing area includes following items:

TARGET: Area for entering the target value
1, 2 and 3: Area that displays the 3 analysis values
MAX-MIN: Area that displays the difference between the maximum and minimum of the 3 analysis values
RATIO(%): Area that displays the calculated compensation ratio
RESULT: Area that displays the analysis values after they are compensated

(21) Enter the TARGET values using the numeric and decimal keys.
When the Gain Adjustment screen is opened, the area in which you enter the W-MFV target values will be reversed. Input the W-MFV and R-MCV TARGET values calculated as below:

New W-MFV TARGET = $(TARGET)^2$ / RESULT (of the previous adjustment)
New R-MCV TARGET = $(TARGET)^2$ / RESULT (of the previous adjustment)
* TARGET: W-MFV and R-MCV target values calculated in step (6)

The acceptable range for each parameter is 0.0 to 999.9. If the input range is exceeded, an alarm will sound and the data entry is ignored.
For each parameter, numerals that are not significant digits will be cut off. For example, if the WBC target is entered as 172.05, the set value will be 172.0.
[C] key functions as backspace to delete one character.
If a target value has already been entered, the previous value will be deleted upon any key entry.

(22) To confirm, either press the [ENTER] key or move to the next item with the [□] and [□] keys. If you press the [ENTER] key, the reverse display will shift to the right.

(23) Press the [SELECT] key. The confirmation message will appear.

Confirm Data?	Cont.	Set	Cancel

Figure 4-2: Gain Adjustment Confirmation Message

If you select [Cont.], you can continue to enter target values.
If you select [Set], the target value will be confirmed and the sample will be ready for analysis.
If you select [Cancel], gain adjustment processing will be canceled and the system will return to the Ready Screen.

(24) Open the Detector Cover by loosening the fixing screw.

(25) Mix CELLCHECK-400 ampules vigorously, and pour it into the DB-1 sample beaker.

(26) Pour approx. 3.5 mL of CELLCHECK-400 into the WBC transducer chamber and approx. 2.5 mL into the RBC transducer chamber.

(27) Close the Detector Cover, and press the Start Switch.
The recount analysis sequence will be performed automatically three times and the three analysis values (1 to 3), difference between the maximum and minimum (MAX-MIN), and compensation ratio (RATIO%) will be calculated.

S	*Gain Adjustment* ▷ ▷ ▷ ▷ ▷ ▷		
	Ready		
	W-MFV	R-MCV	
TARGET	172.0	134.8	
1	173.5	132.8	
2	175.5	131.8	
3	174.5	132.3	
MAX-MIN	2.0	1.0	
RATIO(%)	98.6	101.9	
RESULT	172.0	134.8	
Execute Settings?		Yes	No

Figure 4-3: WBC/RBC Gain Adjustment Display

(28) Analysis is performed once again and displays the analysis values (RESULT). Verify that the followings are all satisfied. (W-MFV, R-MCV)

- MAX-MIN ≤ 4 [fL]
- RATIO (%) - 100±50
- RESULT = TARGET±2 [fL]

(29) Select [Yes] if the analysis values (RESULT) satisfy the standard values. The gain adjustment value will be updated and the system will return to the Ready Screen. If the built-in printer is connected, the fourth analysis values and compensation ratio will be printed.

4.1.2 PLT Sensitivity Adjustment

Required reagent: LATEX CALIBRATOR PLT (E); Part No. 951-0222-1

(1) Verify that the temperature of CELLPACK and the room temperature is within the range of 15 - 30°C.

(2) Remove the KX-21 Top Cover, then remove the Shield Cover No. 143 by loosening two each of flat screw M3x8 (SUS) so that you can access the adjustment VR5 on PCB No. 2135 (KX-21)/No. 2150 (KX-21N). *3*

(3) Access to the Maintenance mode.

(4) Press the Start Switch and verify PLT background count falls the range below:
PLT background value ² 10 x 10^3/µL

(5) Select 9. Service from SELECT menu.
Select 2. Service Seq. and 3. Gain Adjustment from the submenu.

(6) From the Gain Adjustment menu, select 2: PLT. The PLT Gain Adjustment screen will appear.

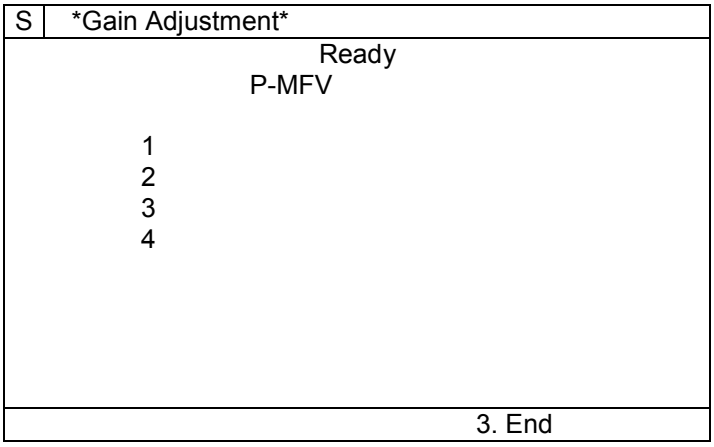


Figure 4-4: PLT Gain Adjustment Display

(7) Mix the PLT Latex Calibrator by gently swirling vial.

(8) Set the Latex Calibrator at the aspiration pipette and press the Start Switch to aspirate it.

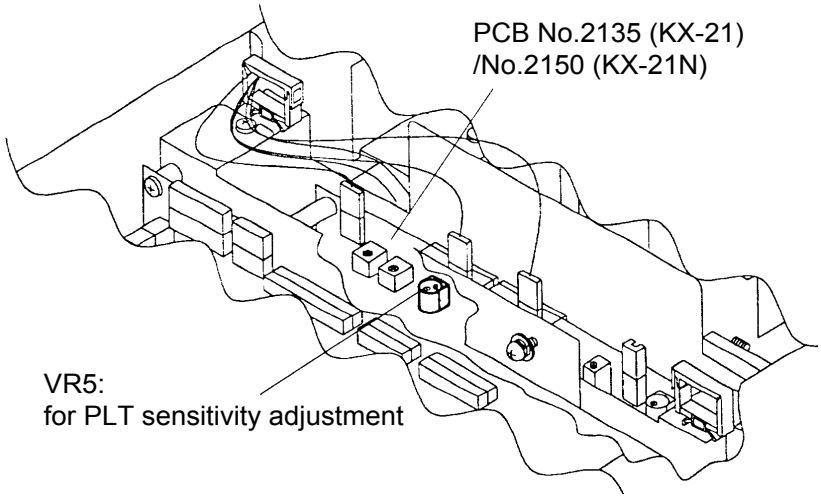
(9) When the analysis is completed, the P-MFV result will be displayed.

S	*Gain Adjustment*
	Ready
	P-MFV
	1 12.0
	2
	3

Figure 4-5: Displayed the 1st Result of P-MFV

(10) Adjust the VR5 on PCB No. 2135 (KX-21)/No. 2150 (KX-21N) so that the P-MFV falls within the acceptable range below. Turning the VR clockwise will increase the value. *3*

P-MFV = (Target MFV value provided for each LATEX CALIBRATOR PLT (PM/C2)) ± 0.2



[fL]

Figure 4-6: VR5 on PCB No. 2135/No. 2150 *3*

(11) Press the Start Switch to recount the Latex Calibrator.
Run the recount sequence and VR adjustment three times in total.

(12) After the 4th analysis (recounting) is completed, press [1] key to continue the Latex analyses again.

(13) Repeat the steps (7) through (11) above until the P-MFV falls into the acceptable range.

(14) After the adjustment is completed, obtain three P-MFV results by analyzing or recounting Latex Calibrator.

(15) Calculate the average of the three results and verify that the average falls within the acceptable range.

(16) Press [3] key to exit the adjustment program.

(17) Refit the Shield Cover No. 143 and the Top Cover.

4.2 HGB ADJUSTMENT

(1) Verify that 30 minutes or more has been passed after the power ON.

(2) Display the Status Display by pressing [SELECT] - [7] (Maintenance) - [5] (Status Display).

S	*Status Display*
	SEQ. NO. 12 PRESSURE 0.50 VACUUM 250 HGB CONVERT 2000 SENSOR 1 2 3 4 5 6 7 8 SV 1 2 3 4 5 6 7 8 9 0 1 2 3 4 5 6 7 8 9 0 1 2 3 4

Figure 4-7: Status Display

(3) Adjust the VR1 on the PCB No. 2135 (KX-21)/No. 2150 (KX-21N) so that the HGB CONVERT value falls within the range 2000±200. *3*

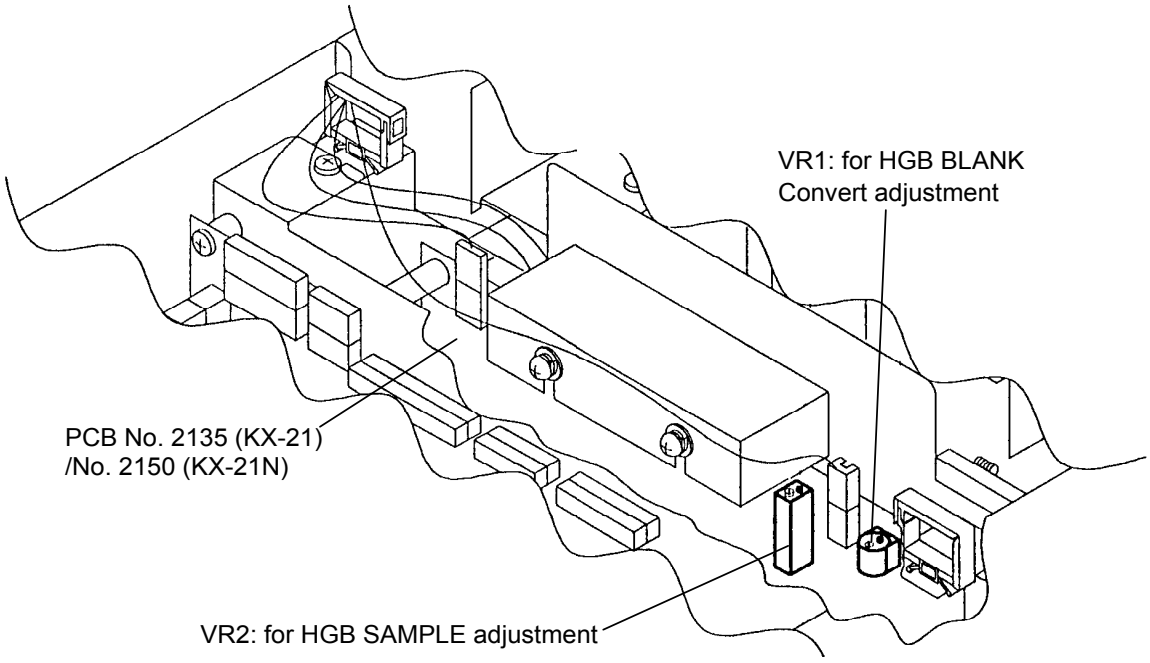


Figure 4-8: VRs for HGB Adjustment

(4) Aspirate the fresh Sysmex control blood EIGHTCHECK (Normal Level).

(5) Press [SELECT] key to stop the sequence at Sequence 7.

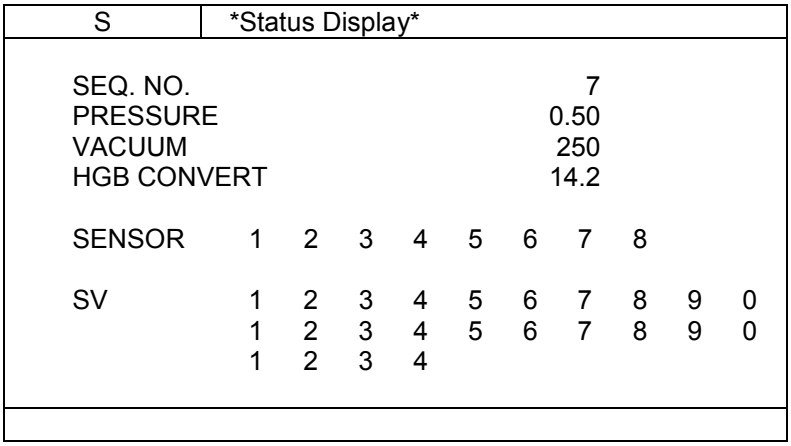


Figure 4-9: Sequence Stop at Sequence 7

(6) Adjust the VR2 on the PCB No. 2135 (KX-21)/No. 2150 (KX-21N) so that the HGB CONVERT value falls within the following range: *3*

HGB CONVERT = (HGB Assay Value for EIGHTCHECK) ± 0.5 [g/dL]

(7) Press [SELECT] key to resume the sequence.

4.3 CLOG LEVEL ADJUSTMENT

(1) Select 9. Service from Select Menu.

(2) Select 2. Service Seq. from Service submenu, and select 7. Clog Adjustment. The Clog Adjustment screen appears.

S	*Clog Adjustment*
	WBC CLOG 98 RBC CLOG 101 Completing automatically in 30 sec.
[SELECT] to exit.	

Figure 4-10: Clog Adjustment Screen

(3) Adjust the VR6 on the PCB No. 2135 (KX-21)/No. 2150 (KX-21N) so that the WBC clog level falls within the range: 100.0 ± 1.0. *3*

(4) Adjust the VR7 on the PCB No. 2135 (KX-21)/No. 2150 (KX-21N) so that the RBC clog level falls within the range: 100.0 ± 1.0. *3*

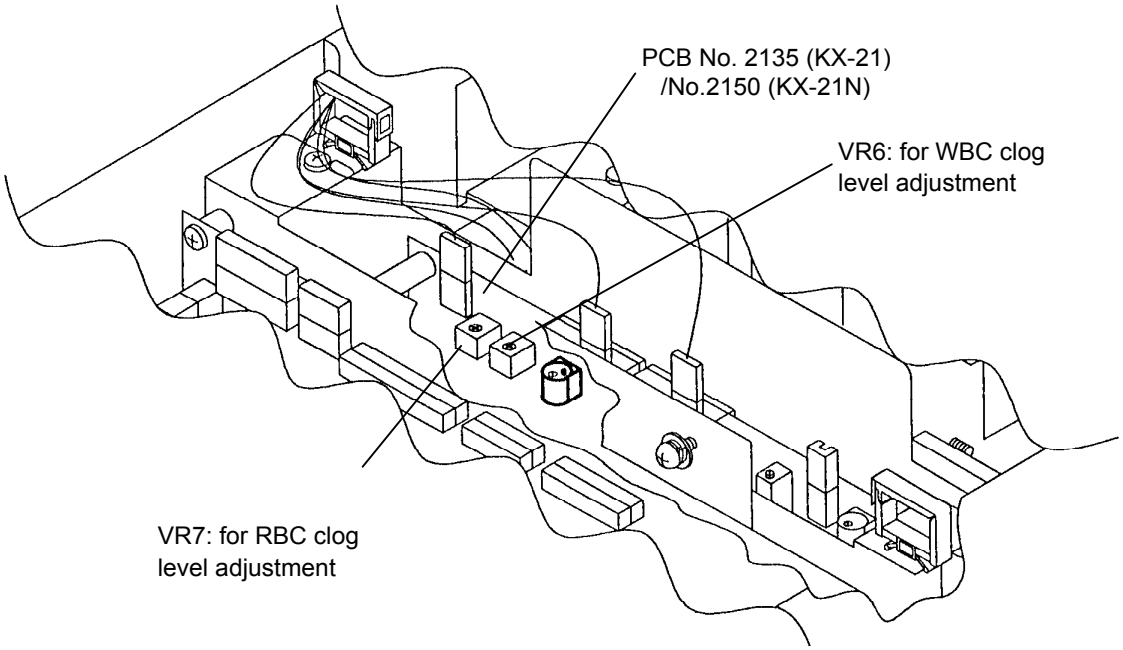


Figure 4-11: VRs for Clog Adjustment

(5) The system returns to the Ready screen in 30 seconds.
Or press [SELECT] key to return to the Ready screen.

NOTE: If the adjustment has not been completed when the system returns to Ready, access this program again.

4.4 PCB CHECKING AND ADJUSTMENT

4.4.1 PCB No. 2135 (KX-21)/No. 2150 (KX-21N) 3

(1) HGB circuit adjustment

Adjustment VR	Test Point	Adjustment Item
VR1 *10*	TP18, TP50	Coarse BLANK adjustment
VR2 *10*	TP40, TP51	Coarse GAIN adjustment

(2) Reference voltage adjustment

Adjustment VR	Test Point	Set Value
VR8	TP17	4,100 mV ± 10 mV

(3) A/D START signal pulse width adjustment (Factory use only) *10*

Item	Adjustment VR	Test Point	Set Value
PLT	VR3	TP30	6 µsec ± 10%
RBC	VR5	TP29	6 µsec ± 10%
WBC	VR9	TP28	6 µsec ± 10%

(4) Clog monitoring circuit adjustment

Adjustment VR	Test Point	Adjustment Item
VR7 *10*	TP21	RBC • PLT
VR6 *10*	TP22	WBC

(5) Sensitivity Adjustment

3

PCB No. 2135/No.2150 uses digital VRs to adjust RBC and WBC sensitivity. PLT sensitivity is adjusted by a conventional variable VR.

(6) Test Points

TP8	WBC Sensitivity
TP9	RBC Sensitivity
TP10	PLT Sensitivity
TP11	GND (Analog)
TP12	WBC Clog Monitoring Signal
TP13	RBC Clog Monitoring Signal

NOTE: TP28, TP29 and TP30 are 1x1 mm test points.

4.4.2 PCB No. 6363 (KX-21) [3]

(1) DIP Switch S1 Settings (KX-21)

Bit	Function	C-2 (117V)	C-3 (220V, Europe)	C-4 (240V)	C-5 (220V, China)
1	Memory initialization at start up (for factory use only) ON: Start up with memory initialization OFF: Usual start up	OFF	OFF	OFF	OFF
2	Built-in Printer ON: Connected [1] OFF: Not connected	ON	ON	ON	ON
3	Host Computer ON: Connected OFF: Not connected	OFF	OFF	OFF	[A] ON
4	Quick system (production line use only) ON: Connected OFF: Not connected	OFF	OFF	OFF	OFF
5	Histogram display in Pre-diluted Mode ON: Display OFF: Not display	OFF	OFF	OFF	ON
6	Analysis results display when imitation reagent is detected. ON: Display analysis result with an asterisk (*) indicating unreliable data (Level 2) OFF: Not display the result (Level 1)	ON	ON	ON	ON
7	Clog monitoring in Auto Rinse ON: Monitor OFF: Do not monitor	ON	ON	ON	ON
8	Not Used (Fixed to ON)	ON	ON	ON	ON

NOTE: When replacing PCB No. 6363, execute the following procedures: [10]

1) Connect the battery connector on PCB No. 6363.
2) Change the Bit 1 of DIP Switch S1 to “ON” to initialize the memory.
3) Turn the instrument power ON.
4) When the initialization is completed, the message "Entire memory area was initialized. Turn OFF the power." will be displayed. Turn the instrument power OFF.
5) Change the Bit 1 of DIP Switch S1 to “OFF”.
6) Turn the instrument power ON to start up the instrument.

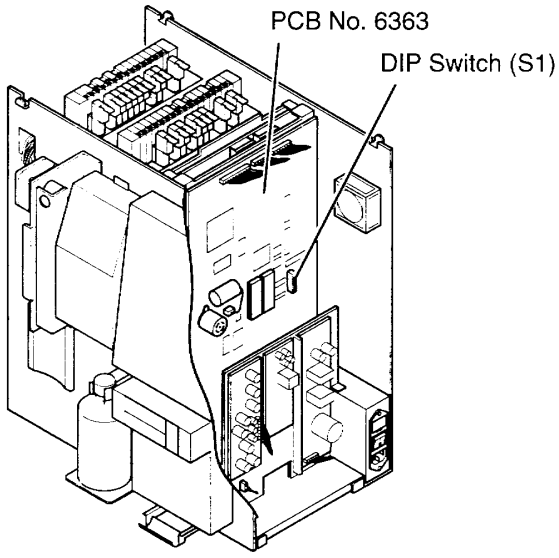


Figure 4-12: DIP SW Location (KX-21)

[A] Revised by ECR398E029

(2) Test Points and Adjustments (KX-21)

Adj. VR	Test	Point	Function & Adjustment	
None	TP1	TP3 (GND)	+5 V (digital):	+5.00 ± 0.25 V
None	TP2	TP3 (GND)	+12 V (digital):	+12.00 ± 0.60 V
None	TP4	TP6 (GND)	+15 V (analog):	+15.00 ± 0.75 V
None	TP5	TP6 (GND)	–15 V (analog):	–15.00 ± 0.75 V
VR1	TP7	TP6 (GND)	WBC A/D reference voltage:	+3.20 ± 0.10 V
VR1	TP8	TP6 (GND)	PLT A/D reference voltage:	+3.20 ± 0.10 V
VR2	TP9	TP6 (GND)	RBC A/D reference voltage:	+3.20 ± 0.10 V
None	TP10	TP3 (GND)	LCD Drive:	Approx. +30 V
VR*	TP11	TP3 (GND)	LCD Contrast Adjustment:	Approx. +21-27 V

NOTE: Adjustment volume for LCD contrast is located at the bottom of Panel Keyboard.
Adjust RBC A/D reference voltage using VR2 just after the initial set up of D/A converter. (For example when the system becomes Ready after Power ON.)

(3) LEDs (KX-21)

LED		Descriptions
D1	RUN:	Lights ON when ASb signal becomes effective. Flashes when a program is running.
D2	HALT	Lights ON when RESETb signal or HALPb signal is generated (1st-3rd pins of J16 are connected.) Also lights ON when 2nd-3rd pins of J16 are connected (ICE Connection Mode).

NOTE: When replacing PCB No. 6363, the factory settings must be changed. Refer to *Section 5.9.3 Factory Initialize* of this manual for the procedures.

4.4.3 PCB No. 6370 (KX-21N) 3

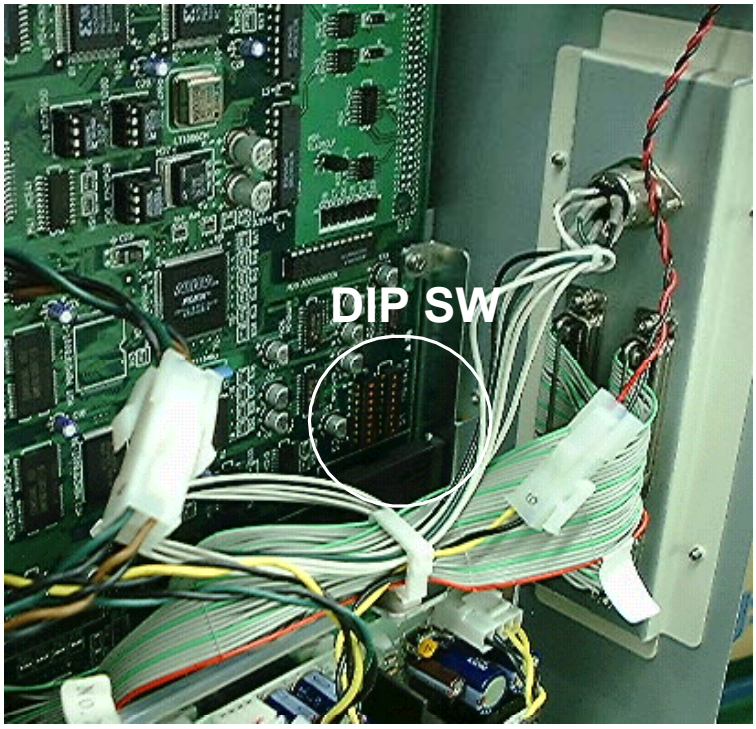


Figure 4-13: DIP SW Location (KX-21N)

(1) DIP Switch S1 Settings (KX-21N)

Bit	Function	C-2 (117V)	C-3 (220V, Europe)	C-4 (240V)	C-5 (220V, China)
1	Memory initialization at start up (for factory use only) ON: Start up with memory initialization OFF: Usual start up	OFF	OFF	OFF	OFF
2	Built-in Printer ON: Connected OFF: Not connected	ON	ON	ON	ON
3	Host Computer ON: Connected OFF: Not connected	ON	ON	ON	ON
4	Quick system (production line use only) ON: Connected OFF: Not connected	OFF	OFF	OFF	OFF
5	Histogram display in Pre-diluted Mode ON: Display OFF: Not display	OFF	OFF	OFF	ON
6	Analysis results display when imitation reagent is detected. ON: Display analysis result with an asterisk (*) indicating unreliable data (Level 2) OFF: Not display the result (Level 1)	ON	ON	ON	ON
7	Clog monitoring in Auto Rinse ON: Monitor OFF: Do not monitor	ON	ON	ON	ON
8	Not Used (Fixed to ON)	ON	ON	ON	ON

NOTE: When replacing PCB No. 6370, execute the following procedures: *10*

1) Connect the battery connector on PCB No. 6370.
2) Change the Bit 1 of DIP Switch S1 to “ON” to initialize the memory.
3) Turn the instrument power ON.
4) When the initialization is completed, the message "Entire memory area was initialized. Turn OFF the power." will be displayed. Turn the instrument power OFF.
5) Change the Bit 1 of DIP Switch S1 to “OFF”.
6) Turn the instrument power ON to start up the instrument.

(2) DIP Switch S2 Settings (KX-21N only)

Bit	Function	C-2 (117V)	C-3 (220V, Europe)	C-4 (240V)	C-5 (220V, China)
1	Not Used (Fixed to OFF)	OFF	OFF	OFF	OFF
2	Not Used (Fixed to OFF)	OFF	OFF	OFF	OFF
3	Not Used (Fixed to OFF)	OFF	OFF	OFF	OFF
4	Not Used (Fixed to OFF)	OFF	OFF	OFF	OFF
5	Not Used (Fixed to OFF)	OFF	OFF	OFF	OFF
6	Not Used (Fixed to OFF)	OFF	OFF	OFF	OFF
7	Not Used (Fixed to OFF)	OFF	OFF	OFF	OFF
8	Not Used (Fixed to OFF)	OFF	OFF	OFF	OFF

(3) Test Points and Adjustments (KX-21N)

Adj. VR	Test	Point	Function & Adjustment	
None	TP1	TP3 (GND)	+5 V (digital):	+5.00 ± 0.25 V
None	TP2	TP3 (GND)	+12 V (digital):	+12.00 ± 0.60 V
None	TP4	TP6 (GND)	+15 V (analog):	+15.00 ± 0.75 V
None	TP5	TP6 (GND)	–15 V (analog):	–15.00 ± 0.75 V
None	TP7	TP3 (GND)	+3.3 V (digital):	+3.30 ± 0.10 V
VR1	TP8	TP6 (GND)	WBC/PLT A/D reference voltage:	+3.20 ± 0.10 V
VR2	TP9	TP6 (GND)	RBC A/D reference voltage:	+3.20 ± 0.10 V
None	TP10	TP3 (GND)	LCD Drive:	Approx. +30 V
VR*	TP11	TP3 (GND)	LCD Contrast Adjustment:	Approx. +21-27 V

NOTE: Adjustment volume for LCD contrast is located at the bottom of Panel Keyboard.
Adjust RBC A/D reference voltage using VR2 just after the initial set up of D/A converter.
(For example when the system becomes Ready after Power ON.)

(4) LEDs (KX-21N)

LED		Descriptions
D1	RUN:	Lights ON when ASb signal becomes effective. Flashes when a program is running.
D2	HALT	Lights ON when RESETb signal or HALPb signal is generated (1st-3rd pins of J16 are connected.) Also lights ON when 2nd-3rd pins of J16 are connected (ICE Connection Mode).

NOTE: When replacing PCB No. 6370, the factory settings must be changed. Refer to *Section 5.9.3 Factory Initialize* of this manual for the procedures.

4.4.4 PCB No. 4087 (Power Supply Unit)

1) PCB NO. 4087

Adjustment VR	Adjustment Voltage	Test Point
VR1	+100 VDC ± 3 V	J6 - 5 (GND) J6 - 6 (+100 VDC)

2) Switching Regulator VS50B-12

Adjustment VR	Adjustment Voltage	Test Point
VR1	+12 VDC ± 0.2 V	CN2 - 1,2 (GND) CN2 - 3,4 (+12 VDC)

3) Switching Regulator VS15B-5

Adjustment VR	Adjustment Voltage	Test Point
VR1	+5 VDC ± 0.1 V	CN2 - 1,2 (GND) CN2 - 3,4 (+5 VDC)

4.5 PROGRAM VERSION UP PROCEDURES

4.5.1 Program Version Up (KX-21) 3

Parts required: New version ROM 1KX21 ASSY
(P/N 973-3311-1: Set of 2 PROMs 1KX2F-01, 1KX2F-02)

(1) Turn the power OFF, and disconnect the power cord.

(2) Verify that reagent tubes and waste line tubes are connected properly.

(3) Remove one each of the fixing screw on right and left sides of the instrument.

(4) Open the front cover, and loosen one each of top cover fixing screw on both left and right sides.

(5) Remove the top cover.

(6) Find PROM 1KX2F-01 and PROM 1KX2F-02 on PCB No. 6363.

(7) Replace these PROMs by the new version ones.
Make sure that PROM 1KX2F-01 is on the left side, and PROM 1KX2F-02 is on the right.
Also make sure that the notched side faces down.

(8) Connect the power cord.

(9) Power ON the instrument.
(When starting up the instrument in Factory Maintenance mode, press the Start Switch when turning ON the power switch, and keep it pressing until a beep sounds.)

(10) The new version number [00-XX] will be displayed on the "Sysmex KX-21" screen.

(11) When the Power Fail error is alerted, press [1] key to continue.

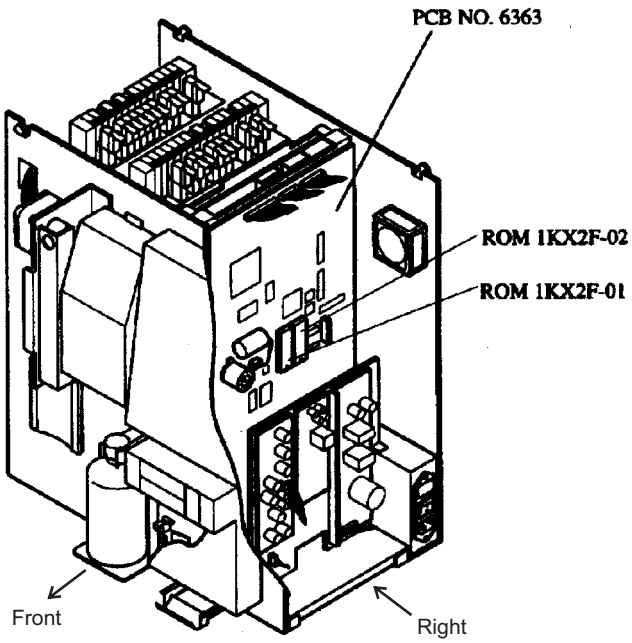


Figure 4-14: PROM Location

(12) If any maintenance instruction message is displayed, execute the required maintenance program. (Refer to the KX-21 Operator's Manual for procedures.)

NOTE: After the Factory Initialize program is executed, or the PCB No. 6363 is replaced, the maintenance instruction messages will be displayed at power ON. In these cases, press [3] key to proceed the start-up without performing maintenance.

(13) When any setting change, initialization, verification is required, access the appropriate Service Program. Refer to Section 5 for the service programs.

(14) Re-mount the top cover, and tighten the fixing screws.
Be careful not to pinch tubes and wirings when mounting the cover.

4.5.2 Program Version Up (KX-21N) 3

Parts required: New version Flash Memory Card 1KXNH ASSY (P/N: 993-2811-6)

(1) Turn the power OFF, and disconnect the power cord.

(2) Verify that reagent tubes and waste line tubes are connected properly.

(3) Remove the IC card slot cover on the rear of the instrument.

(4) When there is a Flash Memory Card mounted, take it out by pressing the eject button.

(5) Insert securely the Flash Memory Card with new program.

(6) Re-mount the IC card slot cover.

(7) Connect the power cord.

(8) Power ON the instrument.
(When starting up the instrument in Factory Maintenance mode, press the Start Switch when turning ON the power switch, and keep it pressing until a beep sounds.)

(9) The new version number [00-XX] will be displayed on the “Sysmex KX-21N” screen.

(10) When the Power Fail error is alerted, press [1] key to continue.

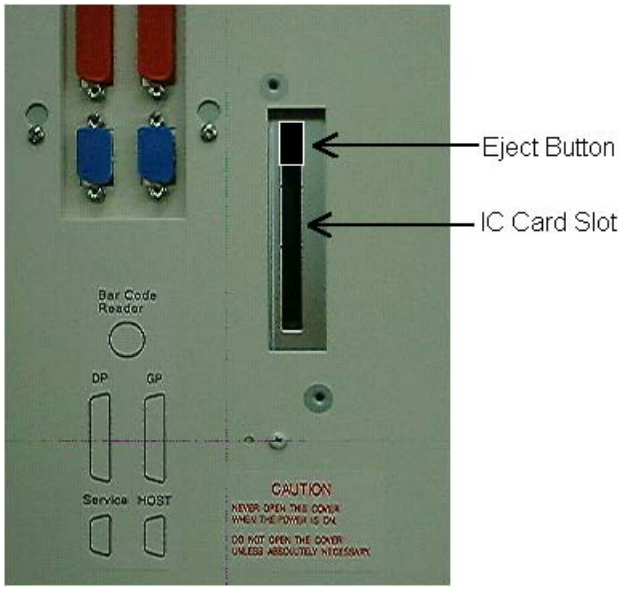


Figure 4-15: IC Card Slot (KX-21N Rear)

(11) Program install window will be displayed.
Press [1] to store the program in the memory.
Press [2] to load the program from the program IC card to start up the instrument. This case, the program will not be stored after the power is OFF.

(12) If any maintenance instruction message is displayed, execute the required maintenance program. (Refer to the KX-21N Operator’s Manual for procedures.)

NOTE: After the Factory Initialize program is executed, or the PCB No. 6370 is replaced, the maintenance instruction messages will be displayed at power ON. In these cases, press [3] key to proceed the start-up without performing maintenance.

(13) When any setting change, initialization, verification is required, access the appropriate Service Program. Refer to Section 5 for the service programs.

4.6 MECHANICAL PARTS ADJUSTMENT

4.6.1 SRV Position Adjustment

(1) Enter the maintenance mode. (See *5.2 ENTERING MAINTENANCE MODE*.)

(2) Select SV Test Operation by pressing “Service” -> “4: Test Operation” -> “2: SV Test Operation”. (See *5.7.2 SV Test Operation*.)

(3) Prepare a drill bit with 0.8 mm diameter. Verify that this drill bit can penetrate through SRV (3 pieces: SRV Fixed Valve (L), Rotor Valve and SRV Fixed Valve (R)) at the SRV alignment hole.
If not, adjust the lower Stopper position by loosening a hex-socket fixing screw so that the drill bit will smoothly penetrate through the SRV.

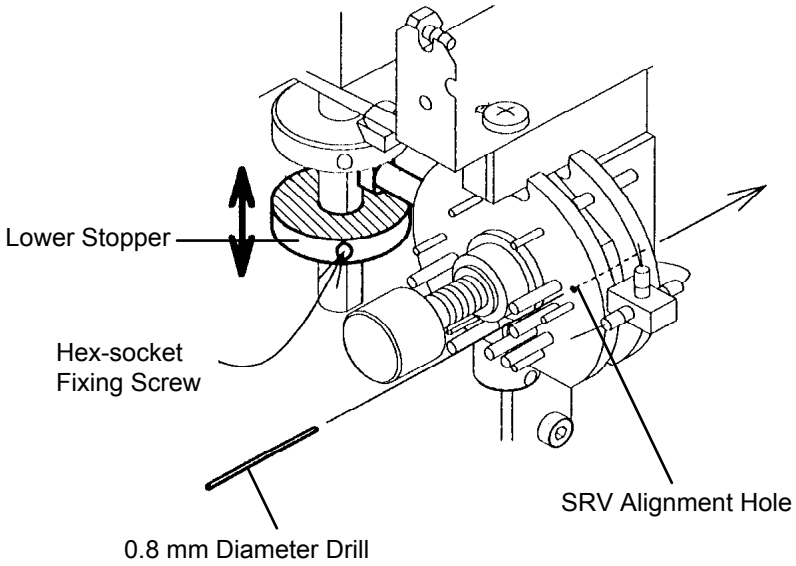


Figure 4-16: SRV in home position

(4) Rotate the SRV by entering SV No. 16 and ENTER.

(5) Verify that this drill bit can penetrate through SRV (3 pieces: SRV Fixed Valve (L), Rotor Valve and SRV Fixed Valve (R)) at the SRV alignment hole.
If not, adjust the lower Stopper position by loosening a hex-socket fixing screw so that the drill bit will smoothly penetrate through the SRV.

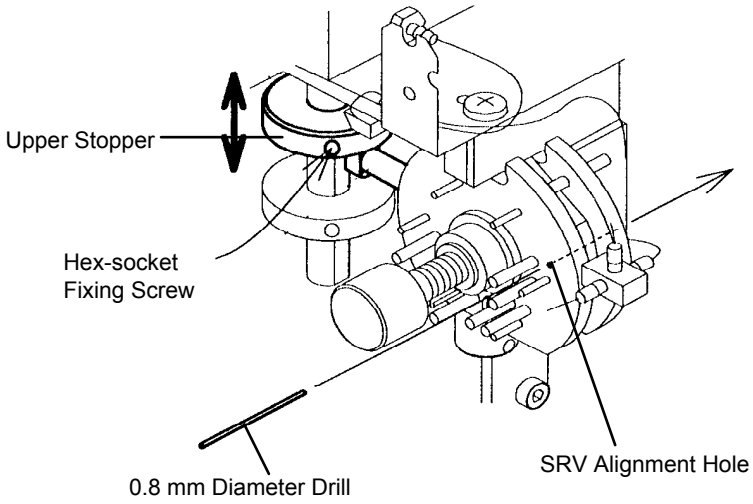


Figure 4-17: SRV in Rotate Position

(6) Rotate the SRV to home position by pressing 16 and ENTER again.

(7) Perform AUTO RINSE and verify that no background count error is reported after rinsing sequence is completed.

(8) Perform QC and verify that the control blood data is acceptable.

4.6.2 Rinse Cup Position Adjustment

(1) Enter the maintenance mode. (See *5.2 ENTERING MAINTENANCE MODE*.)

(2) Press start key and wait until rinse cup descending lowest position.

(3) Press SELECT key to stop the sequence.

(4) Verify the pipette tip is placed in the gap “A”. (View from “B” is easy to verify.)

(5) If adjustment is necessary, adjust the Rinse Cup height by loosening two screws shown in figure so that the pipette tip will be between the gap”A”.

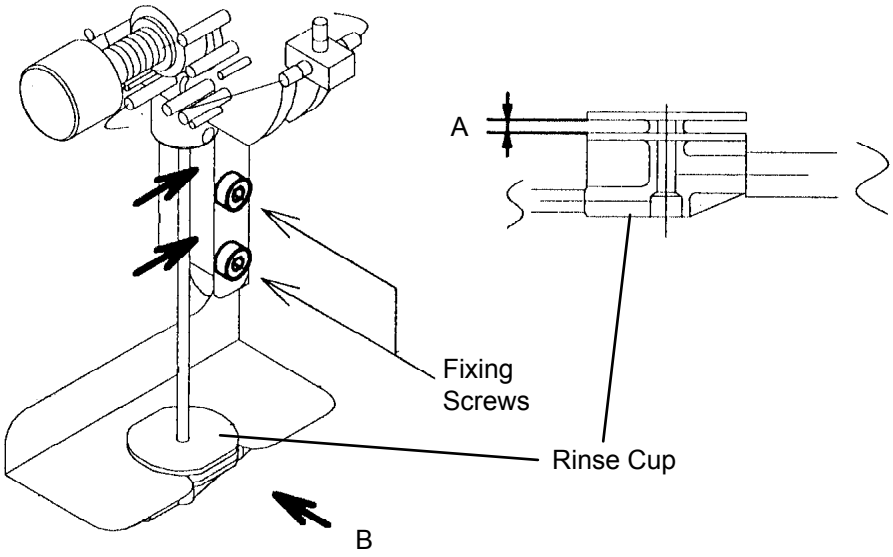


Figure 4-18: Rinse Cup Adjustment

4.7 PNEUMATIC ADJUSTMENT

4.7.1 Pneumatic Adjustment (KX-21N)

The conversion tables for the pneumatic values are as follows. Calculate the values, of which are not in the table, by using the formula bellow. (See *KX-21N Operator's Manual* for the adjustment procedure.)

(1) For Pressure (kg/cm^2 → MPa):
Pressure A (kg/cm^2) x 0.0980665 = Pressure B (MPa)

Pressure A (kg/cm^2)	Pressure B (Mpa)	Pressure A (kg/cm^2)	Pressure B (Mpa)
0.001	0.0001	0.665	0.0652
0.003	0.0003	0.700	0.0686
0.005	0.0005	0.701	0.0687
0.010	0.0010	0.750	0.0735
0.030	0.0029	1.000	0.0981
0.050	0.0049	1.030	0.1010
0.070	0.0069	1.050	0.1030
0.100	0.0098	1.100	0.1079
0.200	0.0196	1.500	0.1471
0.250	0.0245	1.588	0.1557
0.270	0.0265	1.600	0.1569
0.300	0.0294	1.601	0.1570
0.301	0.0295	1.700	0.1667
0.330	0.0324	1.800	0.1765
0.350	0.0343	1.900	0.1863
0.380	0.0373	2.000	0.1961
0.400	0.0392	2.010	0.1961
0.430	0.0422	2.010	0.1971
0.450	0.0441	2.100	0.2059
0.470	0.0461	2.150	0.2108
0.497	0.0487	2.200	0.2157
0.500	0.0490	2.240	0.2197
0.510	0.0500	2.250	0.2206
0.520	0.0510	2.300	0.2256
0.530	0.0520	2.400	0.2354
0.550	0.0539	2.492	0.2444
0.570	0.0559	2.500	0.2452
0.600	0.0588	2.513	0.2464
0.605	0.0593	2.533	0.2484
0.062	0.0608	2.700	0.2648
0.622	0.0610	2.800	0.2746
0.650	0.0637	3.000	0.2942

(2) For Vacuum (mmHg → MPa):
Vacuum A (mmHg) x 0.000133322 = Vacuum B (MPa)

Vacuum A (mmHg)	Vacuum B (Mpa)
5	0.0007
10	0.0013
20	0.0027
35	0.0047
100	0.0133
150	0.0200
180	0.0240
200	0.0267
215	0.0287
220	0.0293
230	0.0307
240	0.0320
248	0.0331
250	0.0333
252	0.0336
260	0.0347
270	0.0360
280	0.0373
290	0.0387
298	0.0397
299	0.0399
300	0.0400
380	0.0507
390	0.0520
400	0.0533
415	0.0553
420	0.0560
440	0.0587
450	0.0600
500	0.0667
510	0.0680
530	0.0707
550	0.0733
600	0.0800