



GENERAL

The ReciPak Remote Control Center option (371-01289-102) provides chiller operating data and control from a remote location. This data includes system status, operating information, fault information, and chiller operating history at the push of a key. Control functions include setpoint control, daily schedule programming, start/stop, and demand limit. Communications between the chiller and the Remote Control Center and updating of information occurs at 30 sec. intervals.

All data is displayed on a 40 character backlit LCD display (2 lines of 20 characters) and is accessed by a soft touch keypad. The keypad and display are built into an 8×10×4" NEMA 1 enclosure designed to be wall mounted.

The Remote Control Center is also designed to enable the user to obtain a remote print-out directly from the remote panel, simplifying the data logging procedure.

One Remote Control Center is required for each individual reciprocating chiller and will only operate with Control Panels which are equipped with a keypad type micropanel. NOTE: The Remote Control Center cannot be used with the MUS Option or a FAX 4500 System.

MOUNTING

Mount the Remote Control Center panel at a convenient location and attach it securely. The panel may be mounted away from the chiller as far as 4000 ft. of wiring will allow.

WIRING

Connection to the remote chiller is by twisted pair coax cable. Operating voltage requirement for the panel is 24 VAC.

If a user supplied 24 VAC is utilized, the power source must be capable of 1A capacity, maintain the voltage between 20–30 VAC, and supply an earth ground to the remote panel. Wire the 24 VAC supply as shown in Fig. 1.

An optional 24 Volt AC Wall Mounted Transformer is available. The transformer converts 115-1-50/60 or 220-1-50 to 24 VAC. The part number for the 115 VAC option is 025-29917-001; the part number for the 220 VAC option is 025-29917-002. The transformer is wired into the remote panel as shown in Fig. 1.

A communications cable must connect the chiller to the remote panel. This cable should be a twisted pair shielded cable type Alpha 4562 or Beldon 9320. The cable MUST NOT exceed 4000 ft. in length.

Wiring of the communications cable is shown in Fig. 1. This cable is wired between TB7 of the chiller's Microprocessor Board and TB2 of the Remote Control

panel. In the case of 3 or 4 compressor chillers, the communications cable MUST ONLY be connected to the Chiller's MASTER Control Panel Microprocessor Board.

Assure that the 180 ohm resistor is connected between terminals 1 and 2 of the TB2 connector in the Remote Control Center. See Fig. 1.

Assure that a jumper connects terminals 3 and 4 of the TB2 in the Remote Control Center. See Fig. 1.

Place the J19 jumper on the Microprocessor Board in the RS-485 position.

Place the chiller in the REMOTE mode by placing S1, Switch #3 of the Chiller's Microprocessor Board, in the proper position.

CAUTION:

The shield of the communications cable MUST only be connected at the Remote Control Center panel and never at the chiller.

Never run the communication cable in close proximity to any power wiring. For best results, it should be run in dedicated grounded conduit.

KEYPAD OPERATION

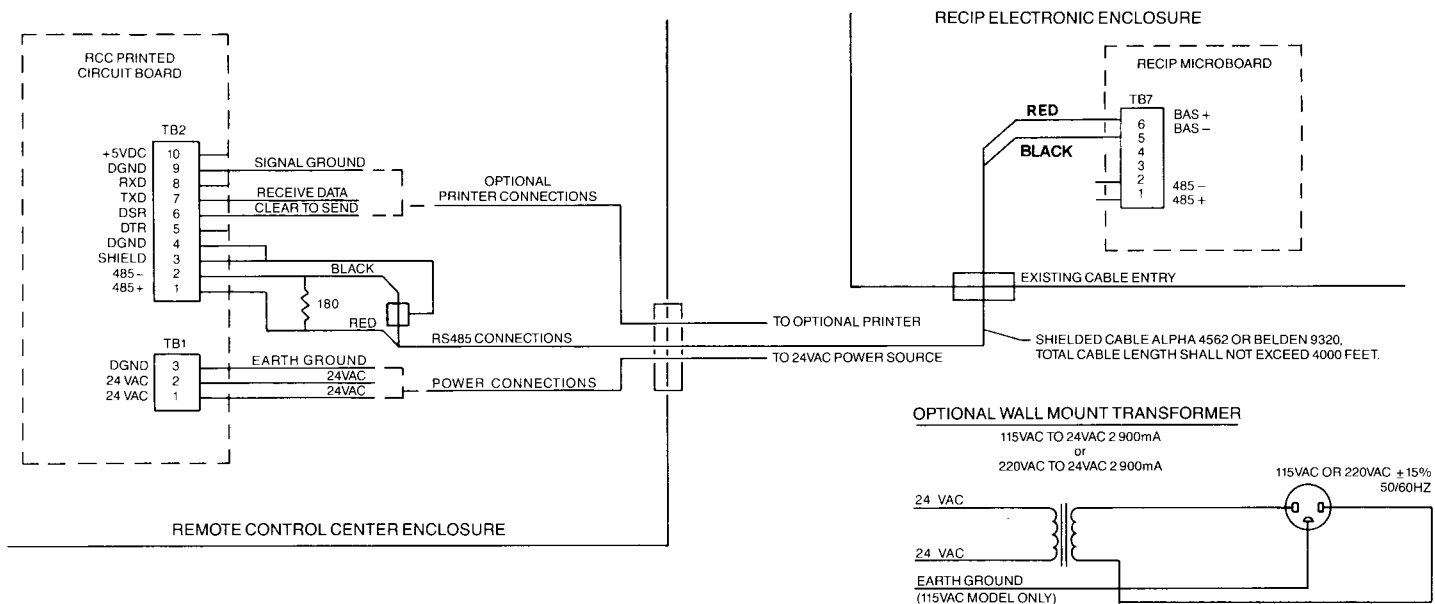
GENERAL

Communications between the chiller and the remote chiller will not occur faster than 30 sec. intervals. This results in a time lag in displays as well as time lags in commands to the chiller from the Remote Control Center. Keep this in mind when using the remote panel. In addition, when power is first applied to the remote panel, a time lag of 30 sec. to 2 min. may be required before initial communications is established.



When the STATUS Key is pressed, information relating to the the general operating condition of each system is displayed. These displays will be very similar to those displayed in the chiller control panel. In the case of 3 or 4 compressor chillers, the STATUS Key must be pressed twice to view status on all systems.

As mentioned, status displays will be much like those displayed at the panel. Explanation of these displays will be outlined in the Installation Manual for each specific chiller. Subtle differences may be noted in the exact wording displayed versus the display which is shown on the chiller control panel. An example of this is apparent in the anti-recycle and anti-coincidence timers. In the case of



CAUTION: THE RECIP MICROBOARD ENCLOSURE AND THE REMOTE CONTROL CENTER ENCLOSURE MUST BOTH BE CONNECTED TO THE SAME BUILDING EARTH GROUND! FAILURE TO DO THIS MAY RESULT IN FAILURE OF BOTH MICRO BOARDS.

FIG1. REMOTE CONTROL CENTER WIRING

these two messages, the chiller control panel indicates actual time left on the timers. The Remote Control Center will only indicate that the timers are "ACTIVE." A few new STATUS displays have been added. The new displays and corresponding explanation of their meaning will follow.

L O S S O F C O M M L I N K
T O R E C I P P A N E L

A LOSS OF COMM LINK TO RECIP PANEL message indicates that the communications link between the chiller Microcomputer Control Center and the Remote Control Center has been lost. This loss of communications is normally a result of disconnecting the RS-485 communications cable between the two panels or the loss of power to the chiller control panel. **NOTE:** This message will appear for 30 seconds when power is first applied to the chiller or the Remote Control Center and should not be cause for alarm.

If communications is lost and not re-established, local chiller setpoints will command chiller control after 5 minutes.

P L E A S E W A I T * * * * *
I N I T I A L I Z I N G R E M O T E

The PLEASE WAIT ***** INITIALIZING REMOTE message will appear shortly after power to the Remote Control Panel or the chiller is first turned on. The message will follow the LOSS OF COMM LINK TO RECIP PANEL message which will disappear when communications is established. During the time the initializing message appears, the remote panel will be communicating with the chiller and filling its memory with current chiller information as well as information from the chiller's three HISTORY buffers. This typically takes 30 seconds or more. As soon as the process is complete, chiller status messages will be displayed.

C H I L L E R S W I T C H E D
T O T H E O F F C O N D I T I O N

CHILLER SWITCHED TO THE OFF CONDITION informs the operator that the OFF Key at the Remote Control Center has been pressed, commanding the chiller to shut down. This message will appear for a few seconds, after which the display will show a REMOTE CONTROLLED SHUTDOWN.

REMOTE CONTROLLED
SHUTDOWN

A REMOTE CONTROLLED SHUTDOWN message indicates that the Remote Control Center has commanded the chiller to shut down.

CHILLER SWITCHED
TO THE RUN CONDITION

CHILLER SWITCHED TO THE RUN CONDITION will appear for a few seconds after the ON Key is pressed at the Remote Control Center, which commands the chiller to turn ON. NOTE: The REMOTE CONTROLLED SHUTDOWN message will then appear for a few seconds until communications of the restart is transmitted to the chiller. Once the transmission of the Run signal is made, the display will automatically display current STATUS of the chiller.

DISPLAY
CHILLER
OPER DATA

Pressing this Key allows viewing of current chiller operating conditions. To scroll through the data, repetitively press the ENTER/ADV Key. The data will scroll each time the key is pressed until all of the displays have been accessed. The display will then automatically return to the Status Display.

NOTE: This data will only be updated every 30 sec. and should not be confused with the display on the chiller which updates approx. every 2 seconds.

PRINT
CHILLER
OPER DATA

When this key is pressed, a printout will be sent to an optional printer. This data will be data that is stored from the last communication with the chiller. This data will be updated every 30 sec.

The following display will appear for approx. 2 seconds when the PRINT CHILLER OPER DATA key is pressed.

OPERATIONAL DATA
PRINT ENABLE

HISTORY

When this key is pressed the following display will appear:

DISPLAY SAFETY SHUT -
DOWN N O. 2 (1 TO 3)

The display will prompt the operator to choose the history buffer the operator wishes to access. The History Buffer stores data that was recorded by the chiller at the instant a fault shutdown occurred. The 3 History Buffers contain data on the last 3 shutdowns regardless of whether the fault caused a system lockout. Keep in mind when accessing these buffers that the most recent fault will be stored in Buffer #1. The Remote Control Center will automatically update the History Buffer each time a fault shutdown occurs.

To choose the buffer to be accessed, press the ↑ or ↓ key until the desired buffer number appears. The ENTER/ADV Key may then be pressed and the first item in the History Buffer will appear. The entire contents of the History Buffer can be scrolled through by repetitively pressing the ENTER/ADV Key.

The contents of the History Buffer will be displayed in a format very similar to the History Buffer which is accessible directly at the Chiller Control Panel.

In addition to manually accessing the History Buffer, the entire contents of all 3 buffers will automatically be dumped to a printer connected to the Remote Control Center where the HISTORY Key is first pressed.

CHILLED
WATER

This key allows the operator to remotely change the chiller setpoint. The Control Range and the Rate Control programming are not accessible remotely and should never be changed once programmed correctly.

When the CHILLED WATER key is pressed, a display will appear for two seconds which prompts the operator as to the type of water control which is programmed at the chiller. One of the following two displays will appear:

RETURN WATER
TEMP CONTROL

LEAVING WATER
TEMP CONTROL

The display will then scroll to the setpoint and control range which is programmed at the chiller and the Remote control panel. A typical RWT and a typical LWT display are shown below.

```
L W T = 4 2 . 0 F
C R = 4 2 . 0 T O 5 2 . 0 F
```

```
L W T = 4 2 . 0 F
C R = 4 2 . 0 T O 4 4 . 0 F
```

By repetitively pressing the ↑ or ↓ keys, the setpoint can be changed in .1 F increments each time the key is pressed.

When the new desired setpoint appears on the display, it can be stored into memory by pressing the ENTER/ADV key.

NOTE: The Control Range (CR) cannot be changed from the Remote Control Center.

Anytime the setpoint is changed remotely, the new setpoint will appear at the chiller control panel after the next communication between the chiller and the Remote Control Center. When the CHILLED LIQUID TEMP RANGE key is pressed at the chiller control panel, one of the following messages will appear for two seconds.

```
R E M O T E   E N T E R I N G
W A T E R   T E M P   C O N T R O L
```

```
R E M O T E   L E A V I N G
W A T E R   T E M P   C O N T R O L
```

These messages indicate that the chiller is operating on a Remote Setpoint command. Therefore, the setpoint and CR which will appear after two seconds will be the setpoint and CR *originally* programmed at the chiller and not the setpoint and CR which are programmed at the Remote Control Center. The new setpoint from the Remote Control Center which the chiller is operating under may be viewed at the chiller by pressing the REMOTE RESET TEMP RANGE key. This display will reflect the new setpoint temperature programmed at the Remote Control Center. An example is shown below.

```
R E M   S E T P O I N T   =   5 3 . 8
R E M   R A N G E       =   2 0   D E G F
```

SCHEDULE/
ADVANCE DAY

The SCHEDULE/ADVANCE DAY key allows the operator to remotely change the daily schedule. This enables remote setting of individual daily start/stop times as well as special holiday start/stop times.

When the SCHEDULE/ADVANCE DAY key is pressed, the following message will appear.

```
M O N   S T A R T   =   0 6 : 0 0   A M
S T O P       =   0 5 : 3 0   P M
```

To view the daily schedules already programmed with no intent of making any changes, the SCHEDULE/ADVANCE DAY key can be repetitively pressed to scroll through the schedule one day at a time.

To change a start/stop time, the ↑ or ↓ key may be pressed, allowing incrementing/decrementing of the time by 15 min. each time the key is pressed.

To store the new time into memory, the ENTER/ADV key must be pressed each time a START or a STOP time is to be stored. Failure to “ENTER” (store) the new time will cause it to be ignored. As new times are “entered,” the cursor will scroll to the next start/stop time.

NOTE: Anytime 00.00 is programmed into a Start time, the chiller will remain in the state (on or off) it was in at the end of the previous day. Programming 00.00 for a Stop time will cause the chiller to remain in the same state (on or off) that it was in during that specific day. Programming the same time for both Start and Stop times will cause the display to enter 00.00 for both times which will, as in the case above, cause the chiller to remain in the same state that it ended in the previous day.

In a situation where it is required to run the chiller 24 hours a day, 7 days a week, the Chiller Control panel should first have its entire Daily Schedule zeroed (00.00) for all Start and Stop times. This puts the chiller in the run mode at all times. The Remote Control Center may now be programmed with all zeroes (00.00) for all Start and Stop times. Since the chiller panel is already in the run mode, programming the Remote Control Panel for all zeroes will keep the chiller in this mode indefinitely, allowing the chiller to run whenever demand requires.

Once the Start/Stop times for each of the days have been programmed, the display will advance to the HOLIDAY Start/Stop time. This allows the operator to program a single Start and Stop time to be used on any day(s) of the

week which may require special programming that will not require repeating the following week. The following display will appear when all days are scrolled through.

```

H O L S T A R T   =   0 8 : 3 0   A M
S T O P           =   1 2 : 0 0   P M
  
```

Holiday Start/Stop times should be programmed in the same manner as individual weekdays. Once the times are "entered," the display will scroll to the next message.

```

S   M   T*   W   T   F   S
H O L I D A Y   N O T E D   B Y   *
  
```

NOTE: In the above display, the * behind Tuesday designates it as a holiday.

When this display appears, the cursor will first stop behind Sunday. To designate a day as a holiday, press the ↑ or ↓ key to place an * behind a day. Pressing the ↑ or ↓ key again will delete the * and the day as a Holiday. Pressing the ENTER/ADV key stores the designation for a given day and advances the cursor to the next day. The cursor will advance until the final day is programmed, which causes the display to scroll to the MON START/STOP display.

The Holiday Schedule programmed for a given week will only be executed once. Once executed, a day designated as a "Holiday" will automatically switch to the Daily Schedule Start/Stop time. The chiller control panel will not re-recognize Holiday programming until a change is made to the Holiday Schedule at the Remote Control Center.



The DEMAND/LIMIT key allows remote limiting of chiller loading regardless of the load as called for by the temperature setpoint and chilled liquid temperatures.

Three levels of maximum loading are offered: 100%, 50%, and 10%. Typically, for most installations, no limiting is required and the programmed limiting will be set for 100%. When pulldown demand limiting is required, 50% loading is recommended. When power restrictions apply under emergency circumstances, 10% loading may be selected.

The number of stages of maximum loading will vary according to the number of compressors on the chiller and the number of stages present. Two-compressor systems will shut down the lag compressor, allowing only the lead compressor to load when 50% loading is called for. 10%

loading will only allow the lead compressor to run unloaded. Three-compressor chillers will allow the system to run with a maximum of one compressor fully loaded and a second partially loaded (Temperature Demand = 9) at 50% capacity. 10% capacity allows a maximum of one compressor to partially load (Temperature Demand = 2) on a three-compressor system. Four-compressor chillers shut down both compressors on the Slave module along with allowing a maximum of both compressors on the Master module to be fully loaded at 50% Demand Limit. At 10% Demand Limit, only the lead compressor on the Master Module (Temperature Demand = 3) may partially load.

Selection of Demand Limiting is accomplished by pressing the DEMAND LIMIT key. One of the following three messages will appear.

```

D E M A N D   L I M I T E D   T O
1 0 0   %   O F   C A P A C I T Y
  
```

```

D E M A N D   L I M I T E D   T O
5 0   %   O F   C A P A C I T Y
  
```

```

D E M A N D   L I M I T E D   T O
1 0   %   O F   C A P A C I T Y
  
```

The percentage of limiting may be changed by pressing the ↑ or ↓ key. To store the selected value in memory, the ENTER/ADV key must be pressed.

Any time a compressor is shut down due to Demand Limiting, a STATUS message will be displayed on the Remote Control Center Display as well as on the Chiller Control Panel Display. An example of this message is shown below.

```

S Y S # 1   C O M P   R U N N I N G
S Y S # 2   L I M I T - C O M P   O F F
  
```

Any time a compressor is running and forced to unload due to demand limit, a STATUS message will be displayed on the Remote Control Center Display as well as on the Chiller Control Panel Display. An example of this message is shown below.

```

S Y S # 1   L I M I T - U N L O A D E D
S Y S # 2   L I M I T - C O M P   O F F
  
```



The ON and OFF keys allow the operator to remotely turn the chiller on and off. When the OFF key is pressed, the following message will appear for a few seconds on the Remote Control Center Display, which indicates that the OFF key has been pressed.



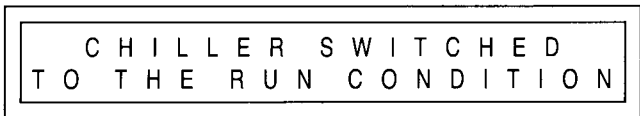
The display will then be replaced with a message indicating the chiller is in the shutdown mode.



The Chiller Micropanel Display will also indicate that a remote shutdown has been commanded. The following display will be observed.



The chiller may be switched to the ON mode by pressing the ON key at the Remote Control Center. When this key is pressed, the following message will appear for a few seconds.



This display will then be replaced by a current STATUS message which will indicate present operating conditions. NOTE: The REMOTE CONTROLLED SHUTDOWN message will appear for a few seconds until communication of a restart is transmitted to the chiller.



The ↑ and ↓ are used to scroll through the displays made available by the various keys on the Remote Control Center which have operator-programmable values. These keys allow viewing without the possibility of entering (storing) new setpoints.

These keys also take the place of a numerical keypad, allowing the user to increment setpoints, scheduling, and Demand Limit by predetermined amounts each time the ↑ or ↓ key is pressed.



The ENTER/ADV key also is used to scroll through the displays made available on the Remote Control Center. This key is used for scrolling when no programmable values are involved.

This key is also used to store new programmed values. This key must be pressed immediately after selecting a new value. Otherwise the new setpoint will not be recognized.

POWER LOSS

In the event of a power loss to the Remote Control Center, the microprocessor in the chiller control panel will continue to adhere to the setpoints and commands dictated from the Remote Control Center prior to the power loss for five minutes. At the end of the five-minute period, the chiller will revert to local control if communication is not re-established. When communications are re-established after power is returned, the chiller will honor all commands programmed into the Remote Control Center.

In the case of a remote shutdown before the power loss occurred, the chiller may start on local control, if demand exists, after five minutes. The chiller will continue to run until demand shuts it off or until communication is re-established. When communication returns, the chiller will shut down, honoring the remote shutdown that was commanded prior to the communications loss. The ability to do this is built into the chiller micro, which remembers the setpoints/control commands established before the communications loss.

EPROM LIMITATIONS

Since the concept and design of the Remote Control Center occurred after the original EPROM (software) for two-compressor chillers, the 031-01096-001 (045B) EPROM will not operate with the Remote Control Center. To allow operation, a new EPROM must be ordered. This can be accomplished by ordering part #031-01096-001. The latest revision will automatically be substituted. Currently, the latest version will have a checksum A478.

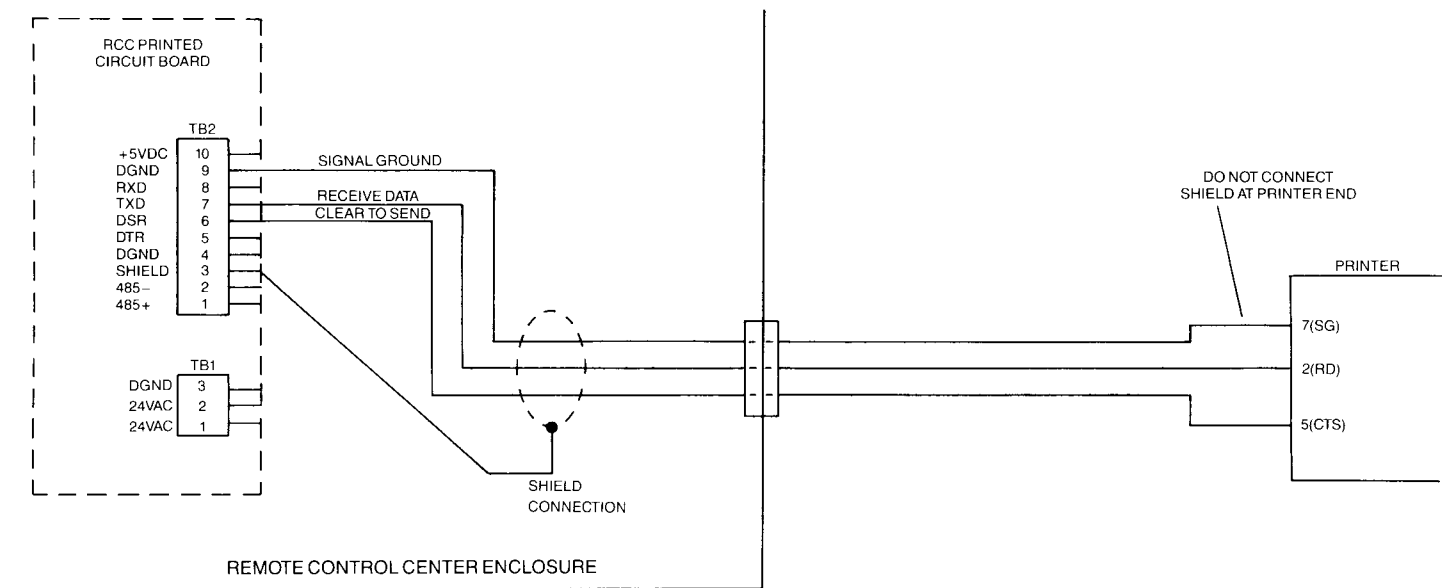


FIG. 2. PRINTER WIRING

PRINTER

The Remote Control Center allows the operator to obtain a remote printout through the Remote Control Center as far as 4000 feet of wiring from the chiller permits. This is in contrast to typical printer hookups which must be no further than 25 ft. from the chiller. NOTE: The printer may not be located beyond 25 ft. of wiring from the Remote Control Center.

A Weightronix IMP 2600 printer is recommended. Wiring for this printer is shown in Fig. 2.

All wiring connections at the printer, printer configuration and printer restrictions that apply with the chiller control panel also apply. See the Installation and Operation Manual for the chiller.

A printout of current system data is initiated by pressing the PRINT CHILLER OPER DATA key on the Remote Control Center. This printout is similar to the one obtained locally from the chiller.

A printout of the last three fault shutdowns may be obtained by pressing the HISTORY key. This printout is similar to the one obtained locally from the chiller.

Any time a fault occurs, an automatic printout is generated. This printout will be a printout of operating conditions at the instant that the fault occurs.

