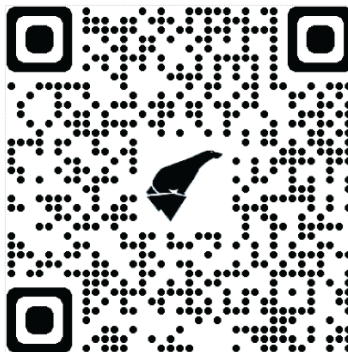




COLD WATER STORAGE SKID GUIDE & USER MANUAL

- CWS SERIES -



COLD WATER SKID SERIES
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CONTACT INFORMATION & AFTER-HOURS SUPPORT

CONTACT INFORMATION

G&D Chillers, Inc.
130 E. 1st Ave
Junction City OR, 97448

1.800.555.0973
info@gdchillers.com
Office Hours: 8 AM – 5 PM (PST)

AFTERHOURS TECHNICAL SUPPORT

G&D Chillers offers 24/7 technical support. For emergency assistance after normal business hours, call the main office at 1.800.555.0973 and choose the tech support option. Your call will be directed to an on-call technician.

INSTALLATION VIDEO LINKS

Visit the following pages for installation video walk-throughs and FAQ's:

www.gdchillers.com/installation-videos/

www.gdchillers.com/installationvideos/how-to-install-a-chiller

www.gdchillers.com/installation-videos/how-to-install-a-portable-fire-ice-chiller/

www.gdchillers.com/faq

NOTICE: CWS WARRANTY REQUIRES ACTIVATION

To activate the CWS parts and labor limited warranty, complete the Warranty-Start-up Checklist and return to G&D Chillers within 30 days

COLD WATER SKID (CWS) DESCRIPTION

FRAME & HOUSING

Fully powder-coated steel frame. Durable powder-coated aluminum cover panels. Integrated fork pockets for convenient and safe lifting.

CIRCULATION PUMP

Base mounted end suction centrifugal pump. Impeller trim is optimized for a pure water.

SUPPLY & RETURN PIPING

Constructed of type M copper. Water and glycol connections FNPT or CTS flange. Quick-disconnect fittings are available upon request

PASSIVE FLUID BYPASS LINE

Maintains balancing of discharge pressure. Permanently brazed, the line allows circuiting from glycol inlet to outlet preventing system or pump damage.

POWER & CONTROLS

All power and operating controls are mounted in a NEMA 3R weather resistant steel enclosure.

CWS power and controls include:

- Siemens LOGO! controller
- Belimo AFRX24-MFT characterized control valve
- Pump contactor
- Panel-mount key switches

BRAZED PLATE HEAT EXCHANGERS

Engineered high efficiency double-walled heat exchanger rated for potable water.

FACTORY TESTING

All CWS units are leak checked, run-tested, and verified at the factory to be in perfect working order prior to shipping

WARNING: OBEY ALL APPLICABLE LOCAL/ NATIONAL ELECTRIC CODES WHEN INSTALLING THIS SKID!

INSTALLATION REQUIREMENTS

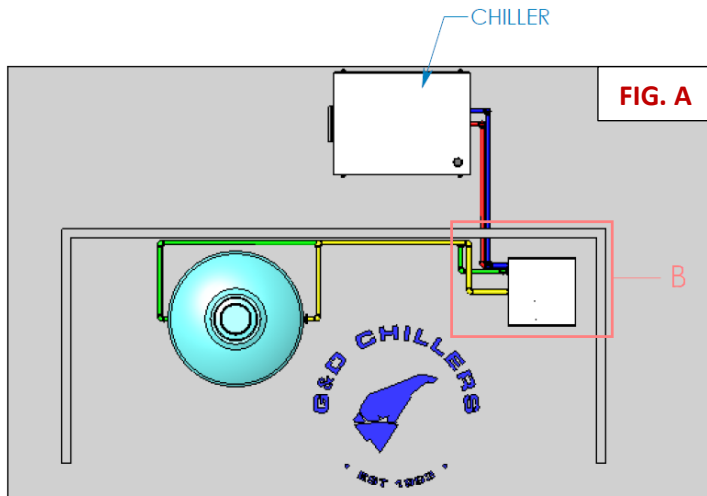
1. The unit should sit on a solid level surface – a concrete pad is recommended. Maintain at least 24” of clearance on all sides.
2. Supply unit with the proper voltage and protect against power spikes. Unit must be properly grounded.
3. Install wiring that meets the electrical requirements of the system and the environmental requirements of the space where the system will be used. Must be installed by a qualified technician.
4. Use only hubs or fittings that meet the environmental requirements where the system will be used.
5. On systems with three-phase pumps, the rotation of the pump must be checked – clockwise from back of the motor. If needed, correct phasing at the unit electrical connection. Ensure that all receptacles where the system may be connected are phased the same.

TORQUE CHART	
Gauge	lbf · in
1000-500	550
500-4	500
350-6	375
250-6	375
4/0-6	275
2/0-14	120
#2 - #3	50
#4 - #6	40
#10 - #14	35

PIPING RECOMMENDATIONS

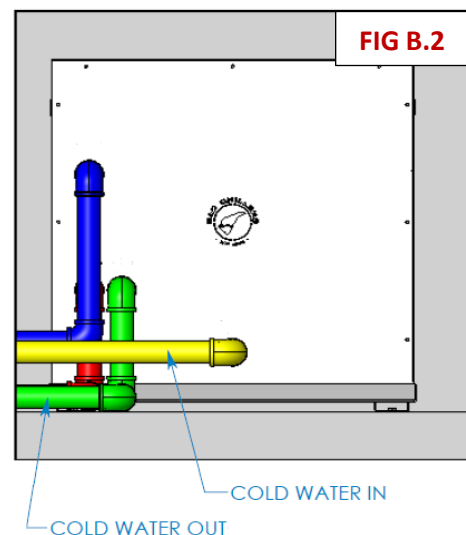
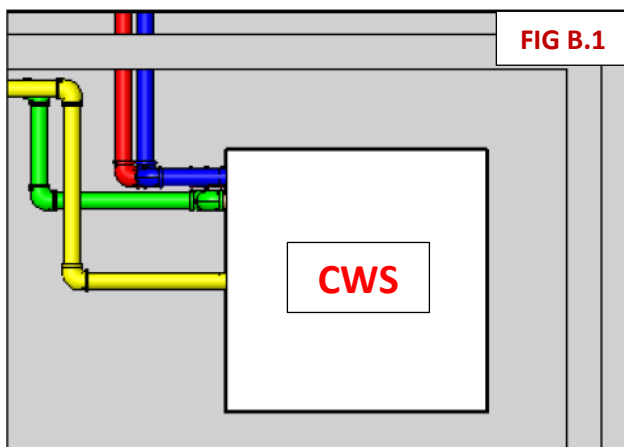
G&D Cold Water Skids are available with FNPT pipe fittings or CTS flanges for glycol inlet/outlet and water inlet/output. Appropriate fittings will need to be field-supplied for equipment connecting to the CWS, including external piping, water reservoirs, tank jackets, heat exchangers, etc.

Confirm that all tank, water, and glycol lines have been flushed of any debris before connecting to them for the first time. Installing a pressure gauge at the water outlet is recommended. Furthermore, it is highly recommended that a 20-mesh wye-strainer is installed at the return of the process reservoir.

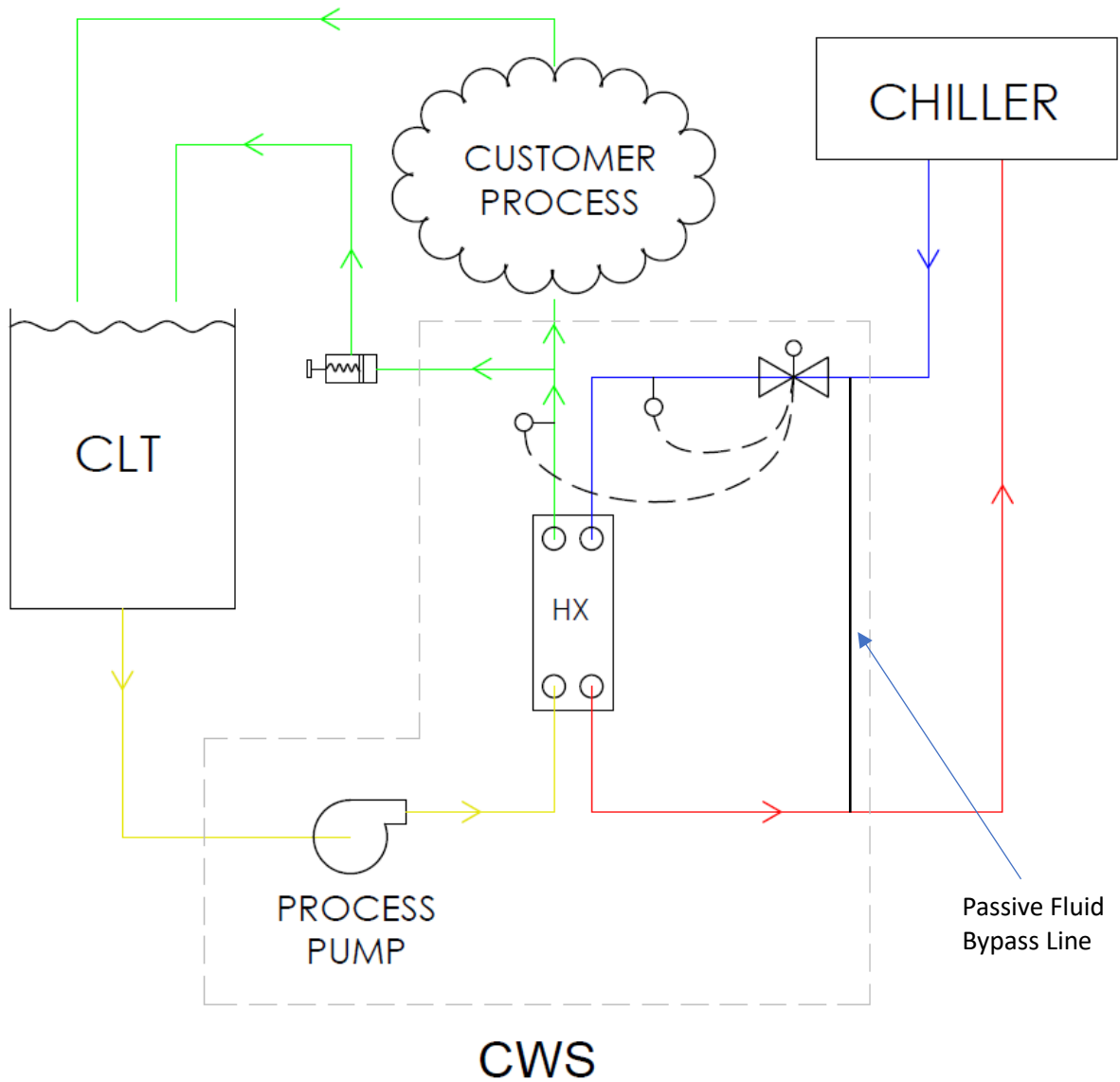





G&D Cold Water Skids are designed to work in conjunction with a G&D Chiller, which utilize a 35% glycol mixture (Fig. A). Confirm chiller glycol concentration with the included refractometer prior to operation.

Figures B.1 and B.2 show an example of a typical CWS integration. Glycol lines are colored red and blue.




PROCESS FLOW DIAGRAM



	TEMPERATURE SENSOR
	BYPASS VALVE
	BELIMO CONTROL VALVE

WARRANTY START-UP CHECKLIST

Jobsite:				Tech Company:
Chiller Model:				Technician:
Chiller Serial #:				Start-Up Date:
FOLLOWING START-UP OF CWS, PLEASE SEND A COPY OF COMPLETED FORM TO G&D TECH SUPPORT				
CWS CLEARANCE (Include photos for warranty)	FRONT:	BACK:	LEFT:	RIGHT:
CHILLER MOUNTING (Anchor required)				
GLYCOL MIXTURE %				
GLYCOL LEVEL (Reservoir % Full)				
PHASE/VOLTAGE				
VOLTAGE TO GROUND (Note: High Leg to L2)	L1:	L2:	L3:	
PUMP ROTATION				
GLYCOL PRESSURE (PSI)				
	COMPRESSOR A	COMPRESSOR B	COMPRESSOR C	COMPRESSOR D
CRANK CASE HEATER ENERGIZED 4 HOURS				
COMPRESSOR OIL LEVEL				
MOTOR AMPS:	L1: L2: L3:	L1: L2: L3:	L1: L2: L3:	L1: L2: L3:
SUPERHEAT (°F) @ 30°F FLUID TEMP				
SUBCOOLING (°F) @ 30°F FLUID TEMP				
SUCTION PRESSURE @ 30°F FLUID TEMP.				
DISCHARGE PRESSURE @ 30°F FLUID TEMP.				
	PUMP #1	PUMP #2	PUMP #3	PUMP #4
MOTOR AMPS:	L1: L2: L3:	L1: L2: L3:	L1: L2: L3:	L1: L2: L3:
	FAN MOTOR #1	FAN MOTOR #2	FAN MOTOR #3	FAN MOTOR #4
MOTOR AMPS:	L1: L2: L3:	L1: L2: L3:	L1: L2: L3:	L1: L2: L3:
	FAN MOTOR #5	FAN MOTOR #6	FAN MOTOR #7	FAN MOTOR #8
MOTOR AMPS:	L1: L2: L3:	L1: L2: L3:	L1: L2: L3:	L1: L2: L3:
AMB @ START-UP (°F)				

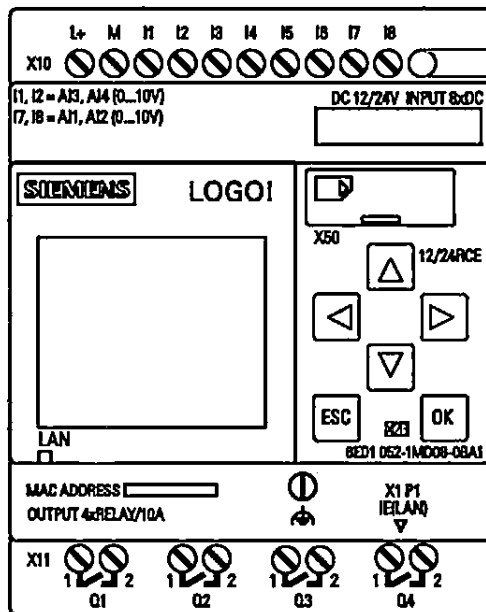
QUICK-START PROCEDURE

- 1.) Have a licensed electrician connect control panel to an appropriate power source as indicated on the CWS data plate.
- 2.) Flush the piping system with water. Do not allow debris to enter the CWS system.
- 3.) Verify glycol used is a 35% propylene glycol mixture.
- 4.) Confirm pump rotation if using 3 phase power.
- 5.) Turn door switch to the “ON” position.
- 6.) Be sure to send a completed copy of the “Warranty Start-up Checklist” to G&D Tech Support!

SEQUENCE OF OPERATION

- 1.) Turn door power switch to “ON” position.
- 2.) Door power switch will energize pump contactor coil.
- 3.) When water reaches desired set point, the Belimo control valve on the glycol circuit closes.
- 4.) The Belimo valve dynamically opens and closes to maintain desired set point.

Below is the Siemens LOGO! controller interface found inside of the CWS electrical enclosure.



CHANGING WATER/GLYCOL TEMP SETPOINT

Contact Tech Support before making programming modifications. Incorrect settings (e.g. SP near or below freezing) may result in equipment damage not covered by warranty.

Press [↓] once, followed by [ESC]. Display turns orange.

Press [→] to access “PROGRAM”, then [→] to access “SET PARAMETER”. Press [OK].

Navigate to “WATER PI”, press [→], then “SP”. Press [OK].

Use [←] and [→] to select decimal. Use [↓] and [↑] to change values. Ex: +00050 corresponds to 50°F.

Press [OK]. Press [ESC] to return to main screen. Press [↑] once.

The process for changing the glycol setpoint is done in the same fashion by changing “GLYCOL PI”.

G&D is not responsible for damages resulting from changes made without consulting Tech Support.

MAINTENANCE

Please contact **G&D Technical Support** if you have any questions or concerns regarding the performance, operation, or maintenance of your Cold Water Skid: **800-555-0973**

- See section below for a brief recommended list of maintenance tasks.
- Contract a licensed technician to evaluate the CWS regularly. These checkups should occur annually at a minimum. Every 3-6 months is recommended.

The CWS requires minimal, but periodic maintenance. Always verify that the accompanying chiller glycol reservoir is at least $\frac{3}{4}$ full prior to use, and that the level does not drop below the low-level sticker while in operation.

The following tasks can be performed without the need for specialized equipment or training:

- Check chiller glycol level and glycol/water concentration monthly. Use glycol refractometer to confirm 35% glycol mixture.
- Verify CWS pump function quarterly. Confirm water supply pressures. Listen for abnormal sounds from the pump.
- If not in use for long periods of time, the pump should be started occasionally and fluid circulated to maintain proper seal lubrication.
- Verify thermostat function quarterly. Check displayed temperature against a thermometer measurement.
- Periodically inspect electrical connections for any signs of failure (scorched or frayed wiring, moisture...). Damaged cords, wiring, or insulation should be replaced immediately.
- See warning below. With the cord unplugged (no power to the CWS), inspect control panel contacts on pump contactors. Contact an electrician if replacements are needed.

WARNING:

DO NOT ATTEMPT TO SERVICE ELECTRICAL COMPONENTS OR MAKE ADJUSTMENTS IN ELECTRICAL PANEL WITHOUT PROPER TRAINING AND IMPLEMENTATION OF LOCK-OUT/TAG-OUT SAFETY PROCEDURES

TROUBLESHOOTING

G&D Cold Water Skids are robust and simple to use. The number of potential failure modes has been minimized by the simple design and few moving parts. If you notice any of the following mechanical issues, contact G&D Technical Support as soon as possible:

- Excessive or unusual vibration
- Abnormally low pump pressure or unusual noise from pump

Symptom	Explanation	Solution
Grinding/knocking noise from water pump	Debris in circuit, or impeller damage	Clean wye strainer and flush out circuit. Pump impeller may require replacement
Pump motor will not turn on	Motor over-temp cutoff, and/or motor contactor damaged	Check motor body temperature. Pump may be overloaded. Check contactor is functioning
Leaking union fittings	Union fittings have loosened from vibrations/shipping, or are physically damaged	Try tightening union fittings. If problem persists, redo thread tape/sealant
Pump leaking between pump head and motor body	Pump mechanical seal is worn out and leaking	Rebuild pump seal
CWS not cooling to SP	Chiller capacity overwhelmed, or Belimo valve is faulty	Verify that glycol temp is lower than water SP. Chiller may have reached maximum capacity. Verify Belimo valve functions properly

WARNING:
DO NOT ATTEMPT TO SERVICE ELECTRICAL COMPONENTS OR MAKE ADJUSTMENTS IN ELECTRICAL PANEL WITHOUT PROPER TRAINING AND IMPLEMENTATION OF LOCKOUT/TAG-OUT SAFETY PROCEDURES

PROPYLENE GLYCOL PROPERTIES

Percent by volume	Percent by weight	Freezing point °F	Degrees Brix °Bx
32.4	33.0	5.3	24.4
32.8	33.4	4.8	24.8
33.1	33.7	4.4	25.0
33.5	34.0	3.9	25.3
34.0	34.6	3.1	25.8
34.4	35.0	2.4	26.1
35.0	35.6	1.5	26.5
35.5	36.0	0.8	26.9
36.5	37.0	-0.8	27.5
37.5	38.0	-2.4	28.0
38.2	38.7	-3.7	28.4
38.5	39.0	-4.2	28.5

For most applications, G&D Chillers recommends no less than and no more than 35% propylene glycol/water mixture.

The volume percentages in this table apply for pure propylene glycol; inhibited propylene glycol solutions will require higher volume percentages. For example, a solution of 36.6%vol DOWFROST contains 35%vol pure propylene glycol.

Use the refractometer included with the chiller to verify proper glycol concentration.

****TO ACTIVATE WARRANTY, FILL OUT STARTUP CHECKLIST AND RETURN WITHIN 30 DAYS****

WARRANTY STATEMENT

TWO-YEAR LIMITED WARRANTY ON PARTS, ONE-YEAR LIMITED WARRANTY ON LABOR

G&D CHILLERS, INC. provides a limited warranty to the original purchaser of new products against defects in materials and workmanship for a period of one (1) year of normal commercial usage. For the subsequent period of one (1) year of normal commercial usage immediately following the first, this warranty is extended to cover parts only. This warranty is not transferable. If a product covered by this warranty is determined to be defective within the applicable warranty periods, G&D CHILLERS, INC. will, unless otherwise required by applicable law, either repair or exchange the product at its sole option and discretion.

EXCHANGE

Should G&D CHILLERS, INC. elect to exchange a product due to a covered defect during the warranty period, the replacement unit may, at G&D CHILLERS, INC.'s sole option and discretion, be new or one which has been recertified, reconditioned, refurbished or otherwise remanufactured from new or used parts and is functionally equivalent to the original product.

REPAIR: PARTS AND LABOR

There will be no charge for parts or labor to repair a product for a covered defect during the applicable warranty periods. Replacement parts may, at G&D CHILLERS, INC.'s sole option and discretion, be new, used, reconditioned, refurbished or otherwise remanufactured or recertified as functionally equivalent replacement parts.

REMAINING WARRANTY

Repaired or exchanged products are warranted for the remaining portion of the product's original warranty or for ninety (90) days from warranty service or exchange, whichever is longer. Any upgrade to the original product will be covered only for the duration of the original warranty period.

EXCLUSIONS

This warranty does not cover, for example: abuse, accident, acts of God, consumable parts such as batteries, cosmetic damage (e.g. scratches, dents, cracks), damage caused by use with non-G&D CHILLERS, INC. products (e.g. accessories, housing, parts, etc.), damages from shipping, improper installation or operation, improper voltage supply or power surges, lack of reasonable use, misuse, modifications or alterations, normal wear and tear or aging, as well as installation and set-up issues or any tampering or repairs attempted by anyone other than by a G&D CHILLERS, INC. authorized repair technician. This limited warranty does not cover products sold "AS IS", "FACTORY RECERTIFIED", or by a non-authorized reseller.

ASSIGNMENT OF WARRANTIES

G&D CHILLERS, INC. assigns to product purchasers any and all warranties of manufacturers and suppliers of component parts that are assignable, but G&D CHILLERS, INC. makes no representations as to the effectiveness or extent of such warranties and assumes no liability or responsibility for any third-party manufacturer or supplier's products or component parts that are sold by G&D CHILLERS, INC.

DISCLAIMER OF WARRANTY

THERE ARE NO EXPRESS WARRANTIES OTHER THAN THOSE LISTED OR DESCRIBED ABOVE. EXCEPT AS SPECIFIED IN THIS WARRANTY SECTION, ALL EXPRESS OR IMPLIED CONDITIONS, REPRESENTATIONS, AND WARRANTIES INCLUDING, WITHOUT LIMITATION, ANY IMPLIED WARRANTY OR CONDITION OF MERCHANTABILITY, FITNESS FOR A PARTICULAR PURPOSE, OR ARISING FROM A COURSE OF DEALING, LAW, USAGE, OR TRADE PRACTICE, ARE HEREBY EXCLUDED TO THE EXTENT ALLOWED BY APPLICABLE LAW AND ARE EXPRESSLY DISCLAIMED BY G&D CHILLERS, INC. TO THE EXTENT THAT ANY OF THE SAME CANNOT BE EXCLUDED, SUCH IMPLIED CONDITION, REPRESENTATION AND/OR WARRANTY IS LIMITED IN DURATION TO THE EXPRESS WARRANTY PERIOD REFERRED TO IN THE "LIMITED WARRANTY" SECTION ABOVE. BECAUSE SOME STATES OR JURISDICTIONS DO NOT ALLOW LIMITATIONS ON HOW

LONG AN IMPLIED WARRANTY LASTS, THE ABOVE LIMITATION MAY NOT APPLY IN SUCH STATES. THIS WARRANTY GIVES THE CUSTOMER SPECIFIC LEGAL RIGHTS, AND THE CUSTOMER MAY ALSO HAVE OTHER RIGHTS WHICH VARY FROM JURISDICTION TO JURISDICTION.

DISCLAIMER OF LIABILITY

G&D CHILLERS, INC.'S TOTAL LIABILITY FOR ANY AND ALL LOSSES AND DAMAGES RESULTING FROM ANY CAUSE WHATSOEVER INCLUDING G&D CHILLERS, INC.'S NEGLIGENCE, ALLEGED DAMAGE, OR DEFECTIVE GOODS, WHETHER SUCH DEFECTS ARE DISCOVERABLE OR LATENT, SHALL IN NO EVENT EXCEED THE PURCHASE PRICE OF THE PRODUCT. G&D CHILLERS, INC. SHALL NOT BE RESPONSIBLE FOR LOSS OF USE, WORK STOPPAGE, FAILURE OF OTHER EQUIPMENT TO WHICH THE PRODUCT IS CONNECTED, COMMERCIAL LOSS, LOST REVENUE OR LOST PROFITS, LOSS OF GOODWILL, LOSS OF REPUTATION, OR OTHER INCIDENTAL OR CONSEQUENTIAL DAMAGES. NO ORAL OR WRITTEN REPRESENTATIONS MADE BY G&D CHILLERS, INC. SHALL CREATE ANY ADDITIONAL WARRANTY OBLIGATIONS, INCREASE THE SCOPE, OR OTHERWISE MODIFY IN ANY MANNER THE TERMS OF THIS LIMITED WARRANTY. TO THE EXTENT PERMITTED BY APPLICABLE LAW, G&D CHILLERS, INC. DOES NOT WARRANT THAT THE OPERATION OF ANY PRODUCTS COVERED UNDER THIS LIMITED WARRANTY WILL MEET YOUR REQUIREMENTS, OR THIRD-PARTY SERVICES, BE UNINTERRUPTED, ERROR-FREE, OR THAT DEFECTS IN THE PRODUCTS WILL BE CORRECTED. SOME STATES DO NOT ALLOW THE EXCLUSION OF INCIDENTAL OR CONSEQUENTIAL DAMAGES, SO THE ABOVE LIMITATIONS OR EXCLUSIONS MAY NOT APPLY TO YOU. THIS WARRANTY GIVES YOU SPECIFIC LEGAL RIGHTS, AND YOU MAY ALSO HAVE OTHER RIGHTS, WHICH VARY FROM STATE TO STATE. THIS LIMITED WARRANTY IS SUBJECT TO CHANGE WITHOUT NOTICE. CHECK www.gdchillers.com FOR THE MOST CURRENT VERSION OF THIS WARRANTY.

SEVERABILITY

In the event that any term or provision contained in this limited warranty is found to be invalid, illegal or unenforceable by a court of competent jurisdiction, then such provision shall be deemed modified to the extent necessary to make such provision enforceable by such court, taking into account the intent of the parties. The invalidity in whole or in part of any portion of this limited warranty shall not impair or affect the validity or enforceability of the remaining provisions of this limited warranty.

HOW TO OBTAIN WARRANTY SERVICE (PRE-AUTHORIZATION REQUIRED)

To obtain warranty service, contact G&D CHILLERS, INC.:

1. Email: info@gdchillers.com
2. Phone: (800) 555-0973 from 9:00AM to 5:00PM PST (Monday – Friday)
3. By mail: G&D Chillers, Inc.
130 E. 1st Ave
Junction City, OR 97448



G&D Chillers welcomes any and all questions or concerns
We can be reached at 800-555-0973 or 541-345-3903