

cBoxX SERIES

INSTALLATION GUIDELINES

GE HealthCare



cBoxX 60

cBoxX 100

cBoxX 120

Document Revision History

Version	Date:	Type of Change	Who
R1.0	04.09.23	Customer specific - Installation Guidelines creation - version R1.0	JC
R1.1	04.27.23	Updated the CIP (city water bypass) SAP numbers	JC
R1.2	05.04.23	Removed GE logo and replaced with "GE HealthCare" and added Add trademark symbols to SIGNA, Optima, and Discovery	JC
R1.3	05.06.24	Updated the recommended external piping P&ID (see 2.4.1 Recommended external plumbing - Customer Scope)	JC
R1.3	05.06.24	Added new section "2.4.2 - KKT Filter Kit"	JC
R1.4	08.29.24	Added section 2.3 "When to use a anti-backflow kit" pg. 11	JC

Installation Guidelines

1. Foundation, dimensioning and transport

1.1 Concrete Foundation:

- ⇒ Verify that the installation surface has sufficient load capacity (see chart “chiller weight” below)
- ⇒ A level concrete foundation is recommended per the building code(s) **ACI 318-19 (US) or EN 2016-1/EN 1045-2 requirements / guidelines**
- ⇒ A concrete foundation needs to be 8 in. (200mm) wider and 8 in. (200mm) longer than the chiller cabinet.
 - ❗ Rooftop curbing to be installed per your local building code specifications.
 - ❗ It is recommended to anchor the Chiller directly on the foundation.
- ⇒ Anchoring feet (see below) are used for direct anchoring to a concrete foundation or rooftop framework. **AMERICAS installations only!**

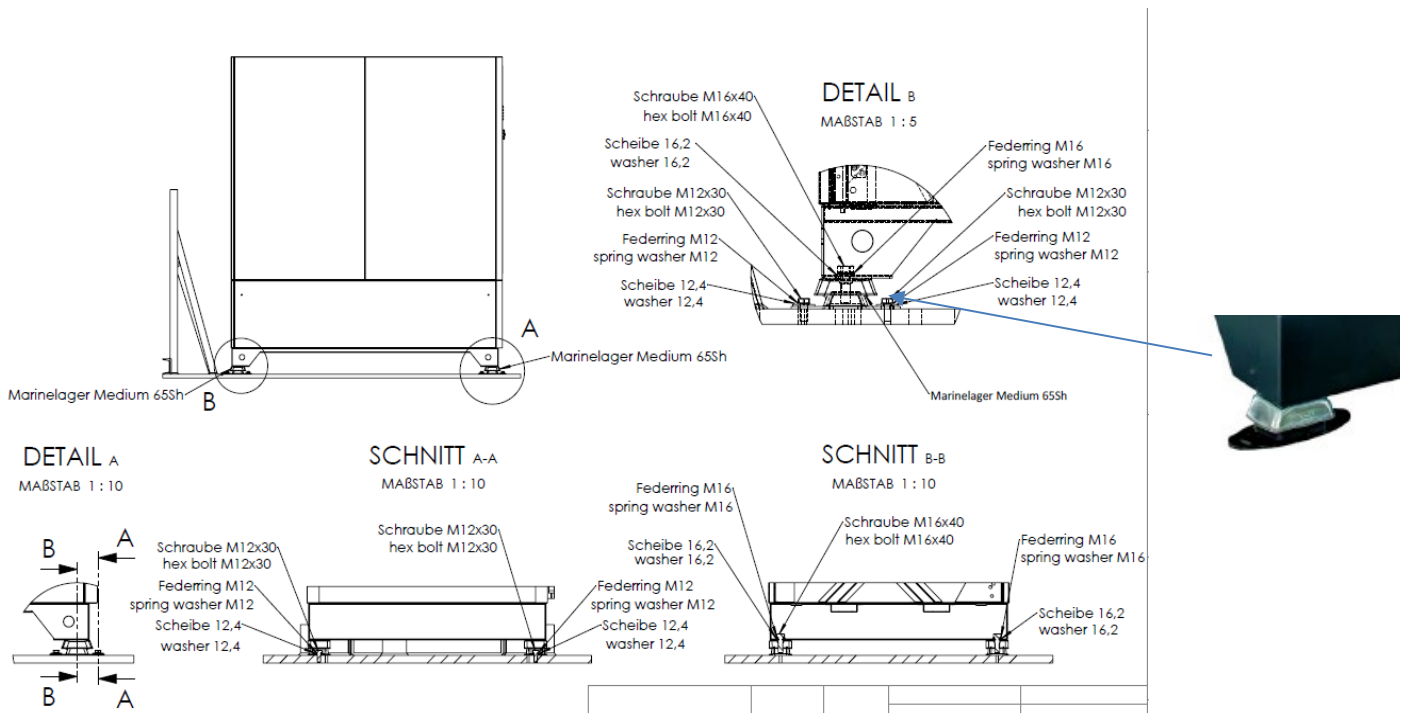
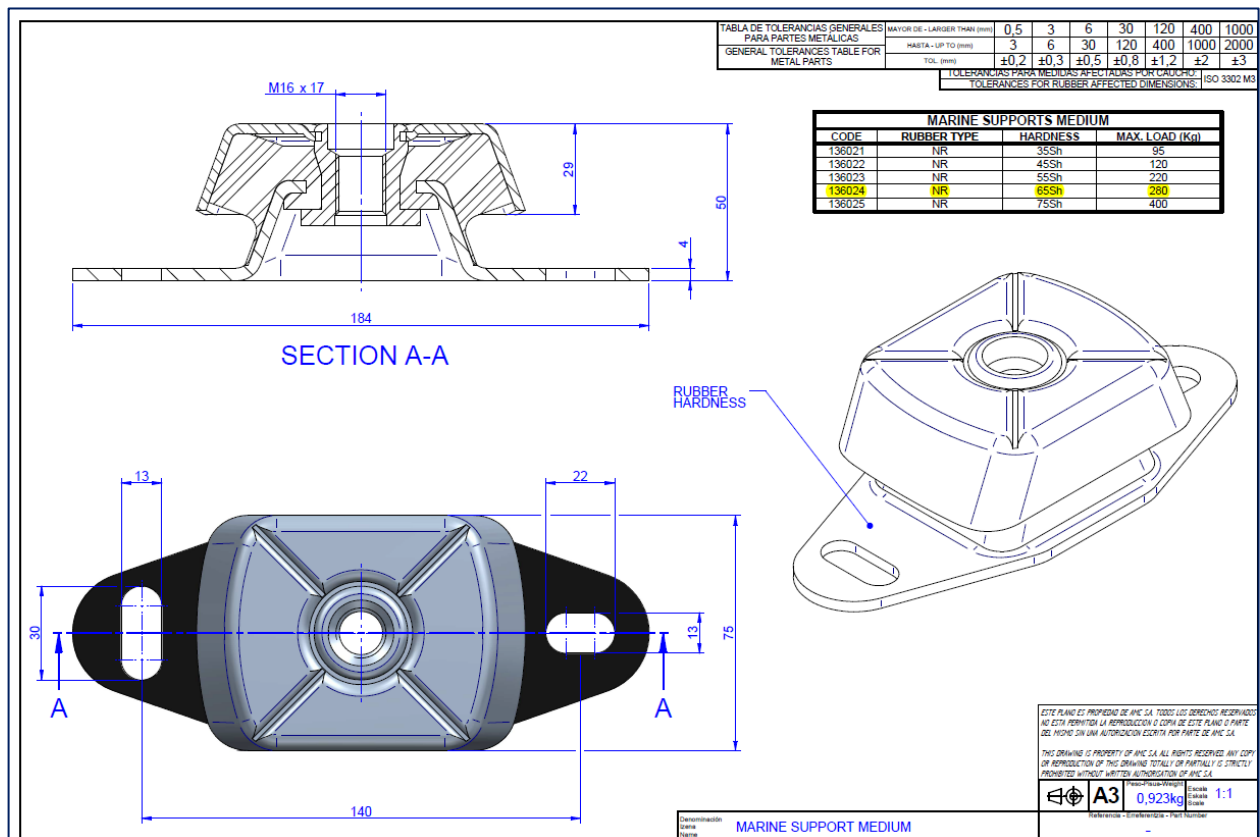


Table 4 Anchor Capacities

Location	Connection	Capacity	Comments
AMC Marine Support Ground Mounted to Concrete One (1) at Each Corner (Four (4) Total)	Two (2) 1/2" Hilti KWIK HUS EZ Screw Anchors per Support	1,629 lb	1. Limited by anchor shear 2. 3" min embedment 3. 3-1/2" min edge distance
		3,243 lb	1. Limited by anchor tension 2. 3" min embedment 3. 3-1/2" min edge distance
AMC Marine Support High-Rise Roof Mounted to Steel One (1) at Each Corner (Four (4) Total)	Two (2) 1/2" ASTM A307 Bolts per Support	7,952 lb	1. Limited by anchor shear 2. Full penetration +3/4"
		7,894 lb	1. Limited by anchor pull-over 2. Full penetration +3/4"



① Rooftop curbing to be installed per your local building code specifications.

1.2 Minimum Pad Dimensions:

- **cBoxX 60:** Approx. 57in. (1448mm) long by 41 in. (1041mm) wide.
- **cBoxX 100:** Approx. 81in. (2057mm) long by 41 in. (1041mm) wide.
- **cBoxX 120:** Approx. 109in. (2769mm) long by 52in. (1041mm) wide.

1.3 Chiller weights (approximate):

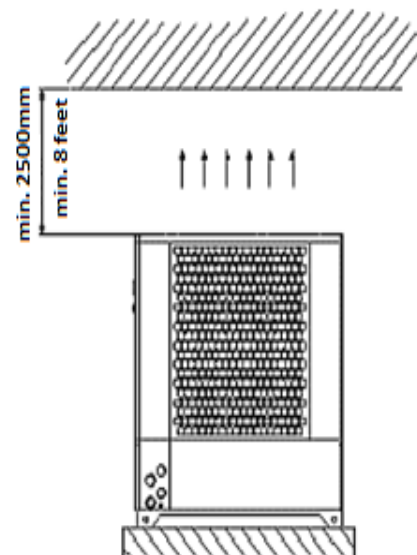
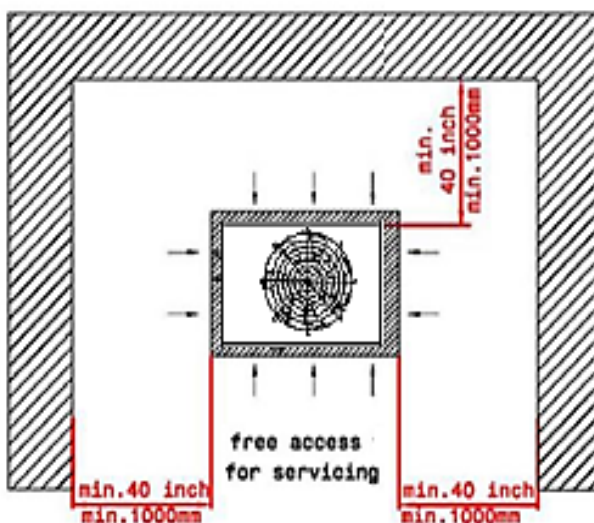
Chiller **INSTALL** weights and dimensions

Model:	cBoxX 60	cBoxX 100	cBoxX 120
Net (Empty / Dry) Weight:	1,319 lbs. (598kg)	1,722 lbs. (781kg)	2,525 lbs. (1.145kg)
Gross (Operating / Wet) Weight:	1,977 lbs. (897kg)	2,822 lbs. (1.280kg)	3,625 lbs. (1.644kg)
Transport. (Crated) Weight:	1,344 lbs. (610kg)	1,765 lbs. (801kg)	2,634 lbs. (1.195kg)

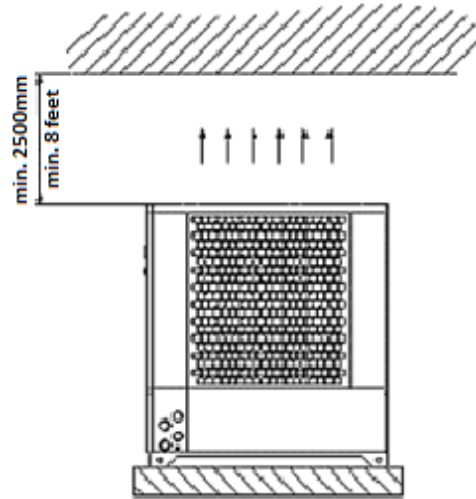
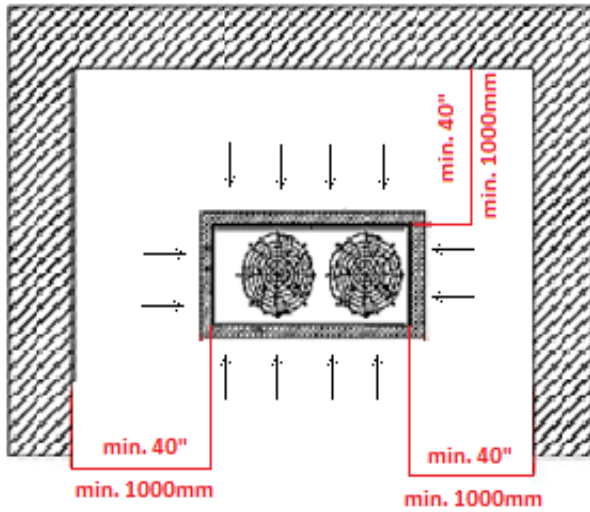
1.4 Installation Clearance: cBoxX 60, 100 and 120

- ① Maintain **at least** 40 in. (1000mm) around all four sides of the chiller for air circulation and servicing.
- ① Maintain **at least** 8 feet clearance (2500mm) above the chiller to allow proper discharge of warm air from the chiller.

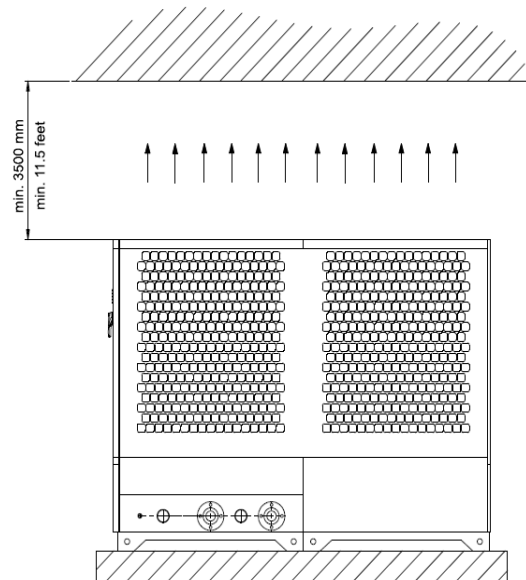
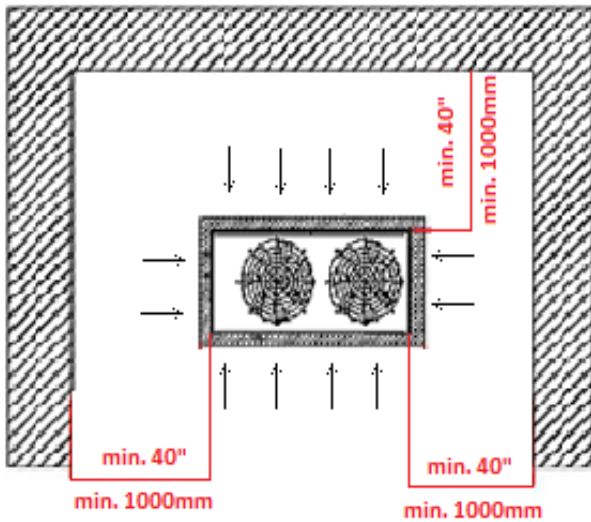
cBoxX 60



cBoxX 100



cBoxX 120



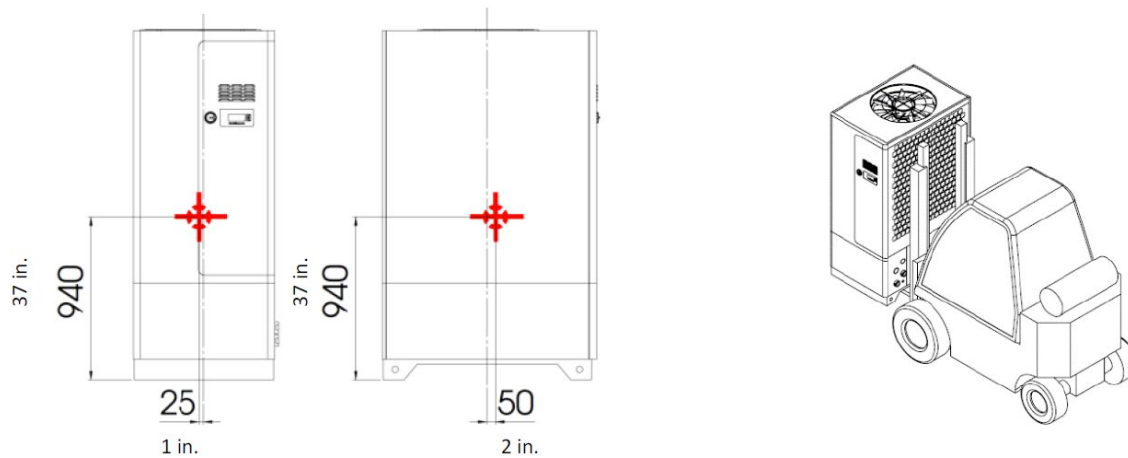
1.5 Transporting and Rigging

CRATE DIMENSIONS (approx.):

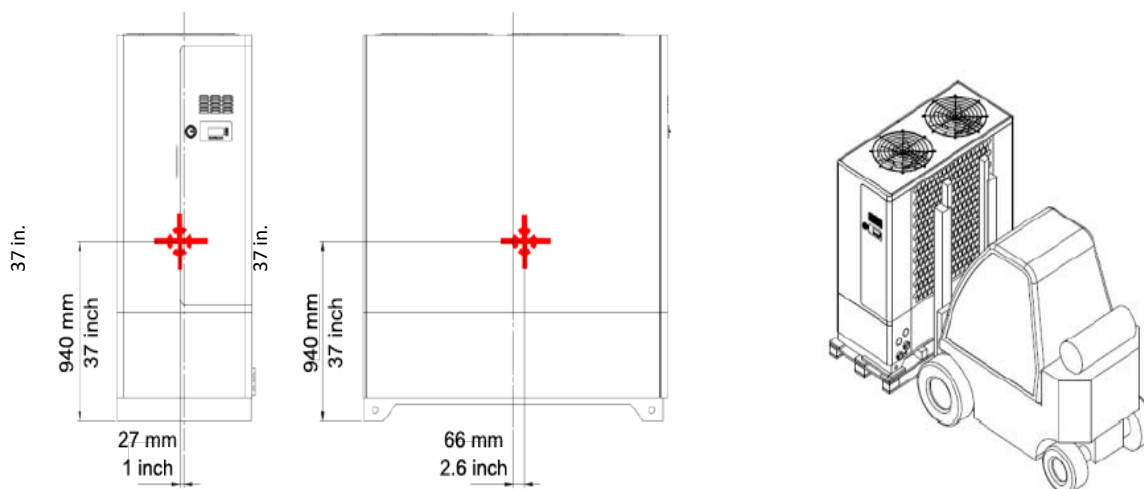
Chiller	Length	Width	Height
cBoxX 60	57" (1357mm)	38" (967mm)	89" (2249mm)
cBoxX 100	77" (1956mm)	38" (967mm)	89" (2249mm)
cBoxX 120	111" (2816mm)	53" (1344mm)	89" (2254mm)

- ① You will also need to consider the height of the transport equipment (pallets, lift truck, transport rollers, etc.)

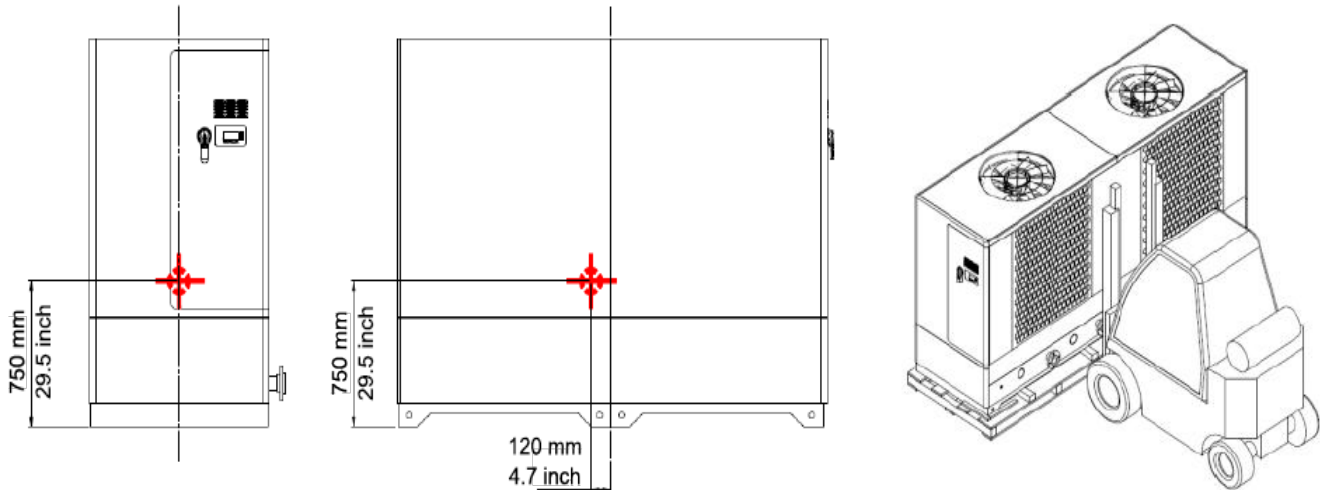
cBoxX 60



cBoxX 100



cBoxX 120



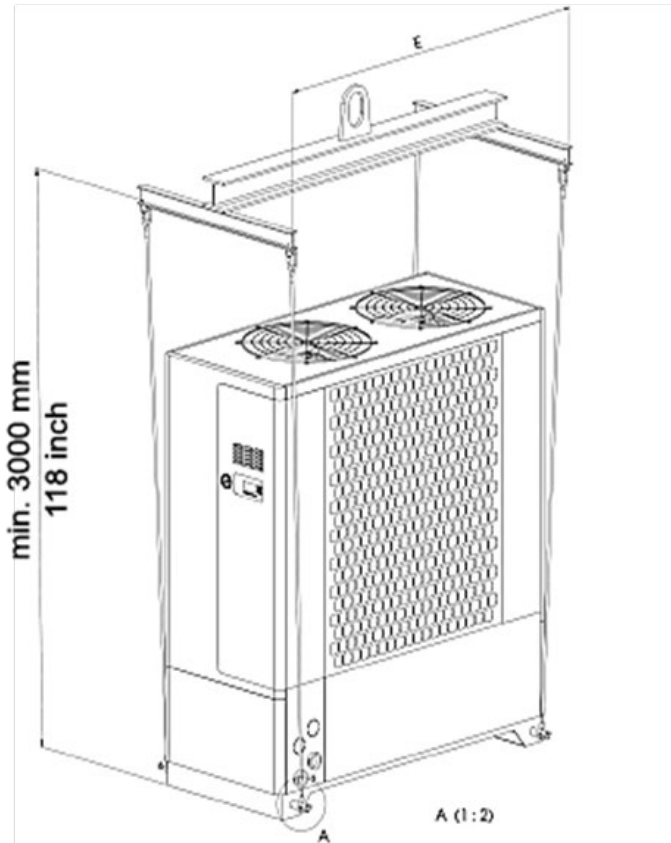
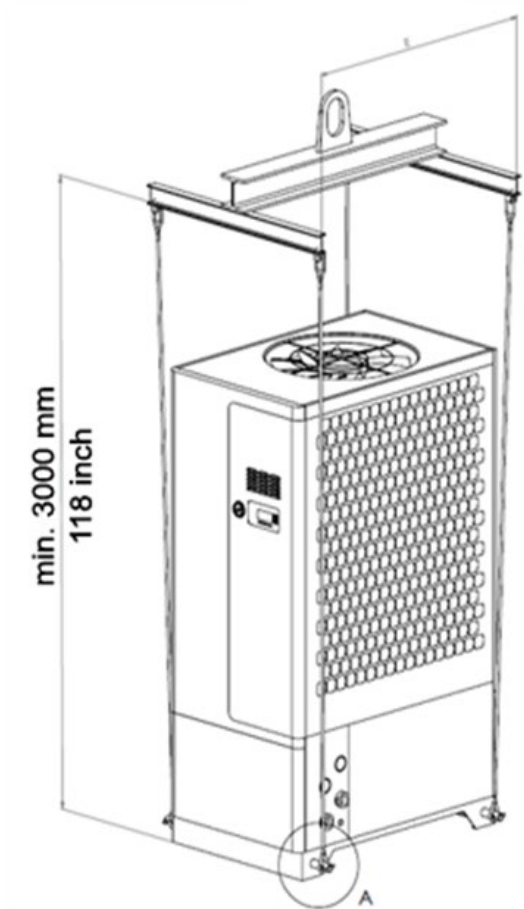
1.6 Crane Transport:

- ① If a crane will be used to transport the chiller, please note the following:
 - ⇒ Lift the chiller **only** from its base. Insert two steel rods through the holes in the base. Rods must be specifically designed for this purpose, and able to support the weight of the unit (see chart).
 - ⇒ Secure the rods with locking pins to prevent shifting. Use only lifting straps or rope for lifting from the rod
 - ⇒ The straps or ropes must be held in place with a frame to keep them from pressing into the side walls, gutters, and condenser body. (Refer to the following graphic).

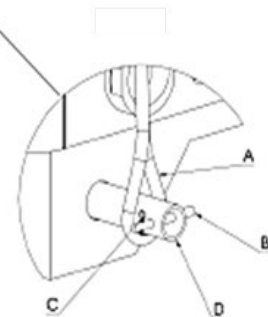
ⓘ Metal rope or chains, should ***not*** be used for the cBoxX 60...cBoxX100!!

cBoxX 60

cBoxX 100

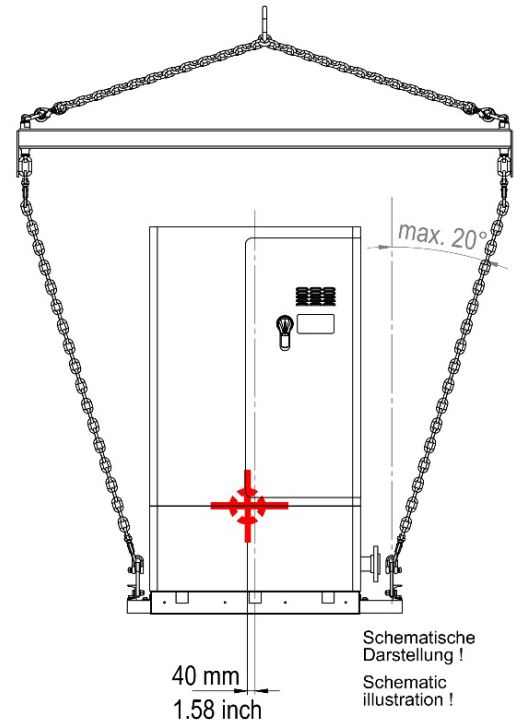
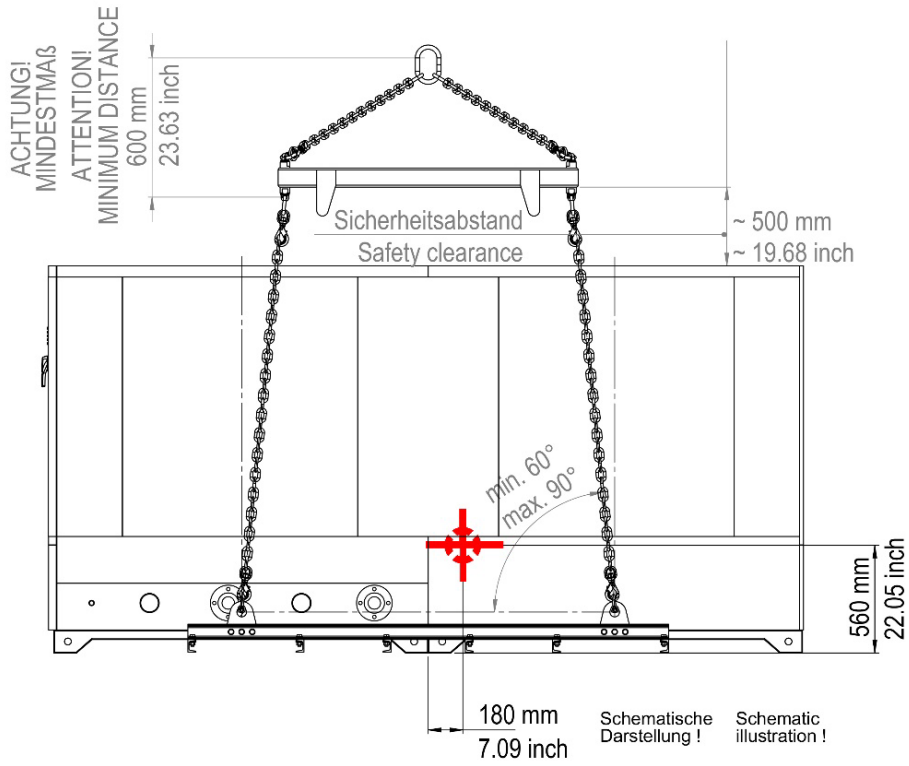


- A Transport sling or rope
- B Locking bolt
- C Split rivet
- D Pipe diameter:
30 - 50 mm, 1.2 - 2 inch
- Wall thickness:
min. 3 mm, 0.2 inch
- Length:
100 mm, 3.94 inch
- E 1300 mm, 51.18 inch (cBoxX 40 - 60)
1900 mm, 74.80 inch (cBoxX 70)



Do not use chain or metal rope!

cBoxX 120



2.0 Piping and Installation

2.1 System design

- ① The system designer is responsible for choosing the material and the cross-section of the hydraulic connections between the chiller and the application. Other dependent factors include the accepted pressure loss in the connection lines and the available pump pressure. When designing the connections attention must also be paid to the minimum flow rate to be maintained and sufficient resistance to the maximum pump pressure.

2.2 Piping Materials Allowed

- ① Use **only** the following materials for the pipes:
 1. Copper is recommended
 2. Stainless steel
 3. PE or PVC – ensure that the appropriate steps are taken to protect the pipe along its length.
- ① ***Never*** use galvanized piping!
- ① For distances exceeding 328 ft. (100M) of straight pipe one way, e-mail the actual pipe length, the difference in height, and the required pipe elbows to KKT chillers Service Team
- ① Maximum allowed elbows in total piping run is ~ 20 pcs.
- ① Long radius elbows must be used.
- ① If the installation differs from the maximum permitted installation height above or below the application, please contact the KKT team.

2.3 When to use a anti-backflow kit

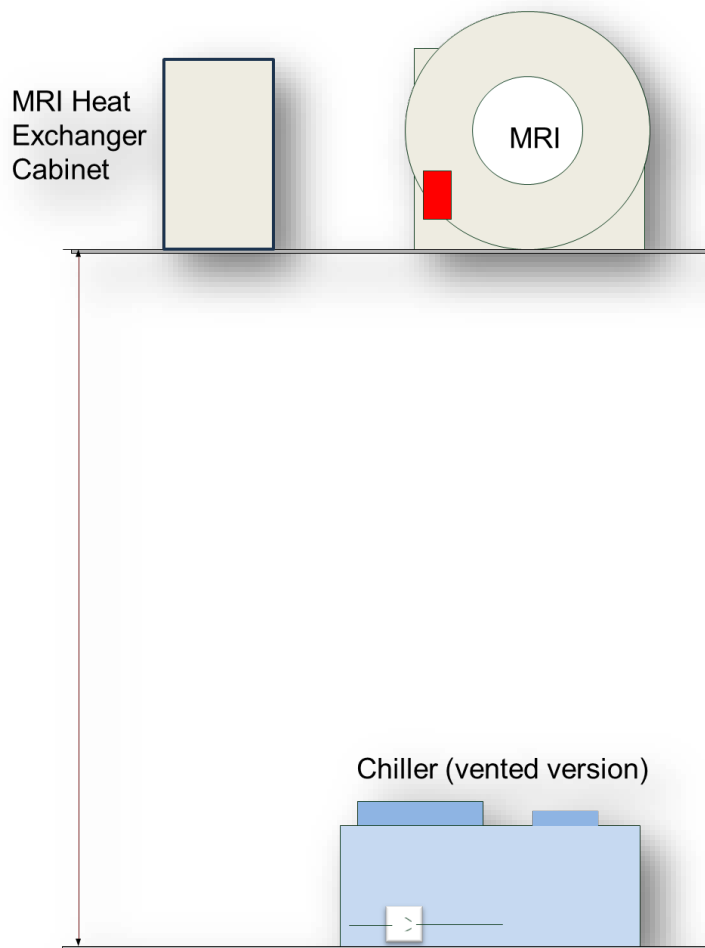
① An anti-backflow kit be used with a chiller system in the following situations:

- **Installation Below MRI Equipment:** If the chiller is installed below the level of the processing equipment, an anti-backflow kit prevents any backflow through the chiller when it is turned off1.
- **Overhead Piping:** When there is overhead piping **≥32 feet** that could cause a backflow through the chiller when the unit is turned off.

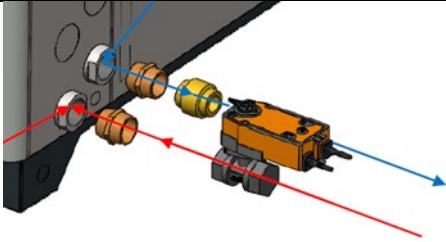
GE Part#:

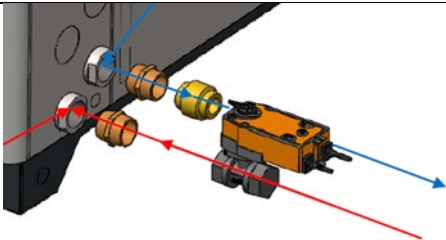
- **E8915LA** - KKT Anti-Backflow kit option for cBoxX 40-100 chillers
- **E8915LB** - KKT Anti-Backflow kit option for cBoxX 120 – 200 chillers

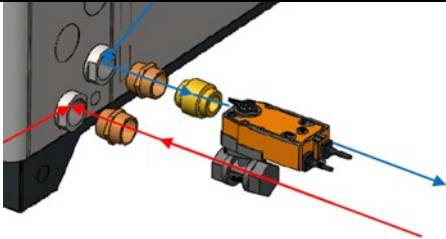
EXAMPLE INLUSTRATION: CHILLER Installation Below MRI Equipment



2.4 Relation of Pipe Diameter to Distance between Chiller and GE HEC cabinet

	cBoxX 60 90906000876z GE (E - CAT): E8914KX
GE HealthCare MRI type(s)	MRI system: "Voyager™" "Pioneer™"
Max allowed elevation above sea level	2000m / 6,562ft
Inlet / outlet chiller connections	2" NPT (Americas)
Max 90° "long radius" elbows	10 one way (or 20 round trip)
Cooling medium	Water / Glycol (KKT protect) 37...50%
Min. return pressure (suction side of chiller pump)	8.7psi (0,6 bar)
Max inlet pressure (GE HEC)	79.8psi (5,5 bar)
Estimated pressure drop across the GE HEC	40.6psi (2,8 bar) @ 15.85gpm (3,6 m ³ /h)
Max permitted vertical distance – chiller above GE HEC	49.2ft (15m)
Max permitted vertical distance – chiller below GE HEC	49.2ft (15m)
NOTE: if the cBoxX chiller is below the MRI, an anti-backflow kit will be necessary to prevent backflow to the tank.	
One way pipe diameter <50m (less than)	1½"
One way pipe diameter >50 (max 100m)	2"
Tank volume	79.25gal (300l)

	cBoxX 100 90910000878z GE (E - CAT): E8914KY
GE HealthCare MRI type(s)	MRI system: "Artist™" "OPTIMA™ MR 450w 1.5T"
Max allowed elevation above sea level	6,562ft (2000m)
Inlet / outlet chiller connections	2" NPT (Americas)
Max 90° "long radius" elbows	10 one way (or 20 round trip)
Cooling medium	Water / Glycol (KKT protect) 37...50%
Min. return pressure (suction side of chiller pump)	8.7psi (0,6 bar)
Max. inlet pressure (GE HEC)	87psi (6,0 bar)
Estimated pressure drop across the GE HEC	40.6psi (2,8 bar) @ 32.58gpm (7,4 m³/h)
Max permitted vertical distance – chiller above GE HEC	49.2ft (15m)
<p>NOTE: if the cBoxX chiller is below the MRI, an anti-backflow kit will be necessary to prevent backflow to the tank.</p>	
Max permitted vertical distance – chiller below GE HEC	49.2ft (15m)
One way pipe diameter <164ft (50m) (less than)	2"
One way pipe diameter >164ft (50) - max 328ft (100m)	2 ½"
Tank volume	132gal (500l)

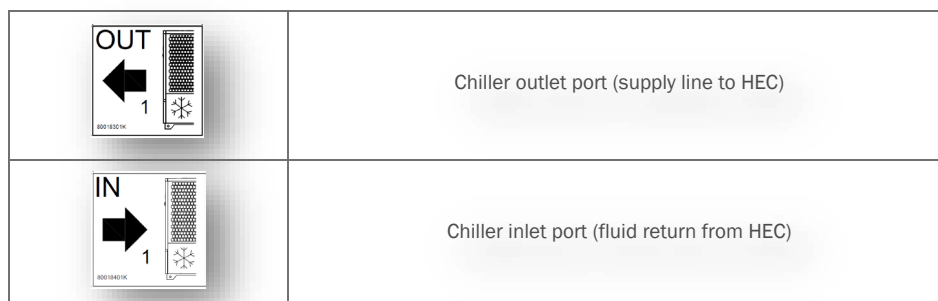
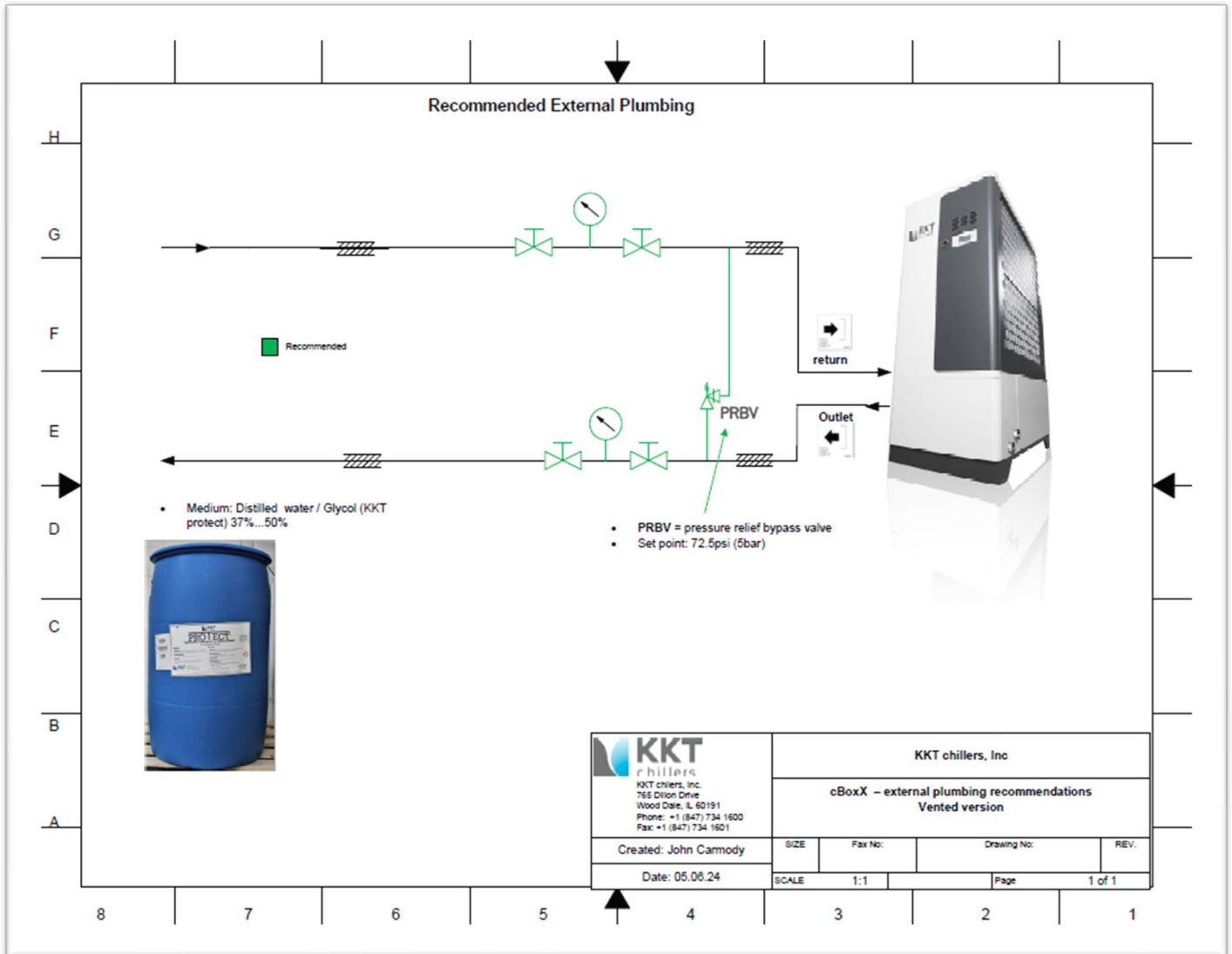
	cBoxX 120 90912000879z GE (E - CAT): E8914KZ
GE HealthCare MRI type(s)	MRI system: “Discovery™ MR 450 1.5T”, “Discovery MR 750 3.0T” “Discovery™ MR750w”, “Architect” “Premier” MRI/PET System: “Signa™ PET MR”
Max allowed elevation above sea level	2000m / 6,562ft
Inlet / outlet chiller connections	2” NPT (Americas) 2” BSP (ROW)
Max 90° “long radius” elbows	10 one way (or 20 round trip)
Cooling medium	Water / Glycol (KKT protect) 37...50%
Min. return pressure (suction side of chiller pump)	8.7psi (0,6 bar)
Max inlet pressure (GE HEC)	87psi (6,0 bar)
Estimated pressure drop across the GE HEC	40.6psi (2,8 bar) @ 32.58gpm (7,4 m ³ /h)
Max permitted vertical distance – chiller above GE HEC	49.2ft (15m)
Max permitted vertical distance – chiller below GE HEC	49.2ft (15m)
NOTE: if the cBoxX chiller is below the MRI, an anti-backflow kit will be necessary to prevent backflow to the tank.	
One way pipe diameter <50m (less than)	2”
One way pipe diameter >50 (max 100m)	2 ½”
Tank volume	132gal (500l)

2.5 External plumbing / KKT Filter Kit

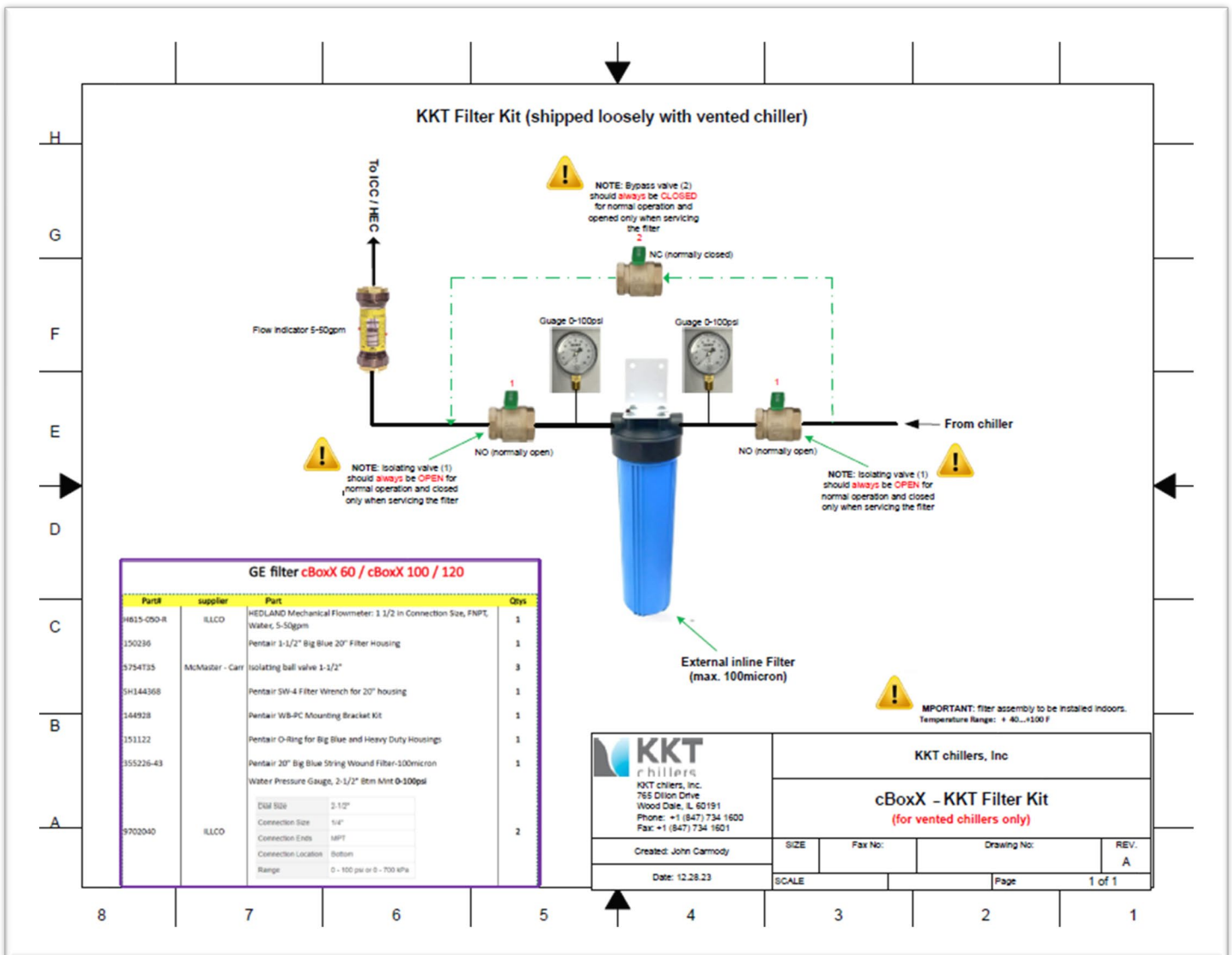
2.5.1 Recommended external piping (customer scope)

cBoxX 60, 100 + 120

(Please note that size of the main inline fixtures / valves should be based on the connection size of the chiller)



2.5.2 Filter Kit (Kit shipped with chiller)



Important!

- ⇒ Temperature Range: + 40 - +100° F
- ⇒ Filter must be protected against freezing, which can cause cracking of the filter and water leakage.
- ⇒ Install on cold water line only.
- ⇒ Do not install where system will be exposed to direct sunlight.

3.0 Technical Requirements

3.1 Glycol

- ⇒ The cBoxX chillers require a water/ glycol mixture of 37 percent glycol to water for regions with ambient temperatures > -13F (-25C). Regions with colder temperatures require a low ambient chiller model and higher glycol concentrations (up to 50%).
- ⇒ KKT only recommends the use of Distilled, Demineralized or Reverse Osmosis water
- ⇒ Factory approved glycol: Ethylene or Propylene



- ❗ Permitted are water fluids and mixtures of Water specification defined in Chapter 2.17 Water quality in the operator’s manual
- ❗ The water - glycol mixture ratios specified in the Technical Data *Chapter 1.2* in the operator’s manual must always be observed
- ❗ Do not mix different brands of Glycol. This can lead to undesired chemical reactions as well as silting.

Prohibited:

- ❗ **Do not use** automotive anti-freeze, or mixture containing >50% concentration of glycol.
- ❗ **Do not mix** different brands or types of glycols without approval from the factory.
- ❗ **Tap water should not be used.**

Required Volume

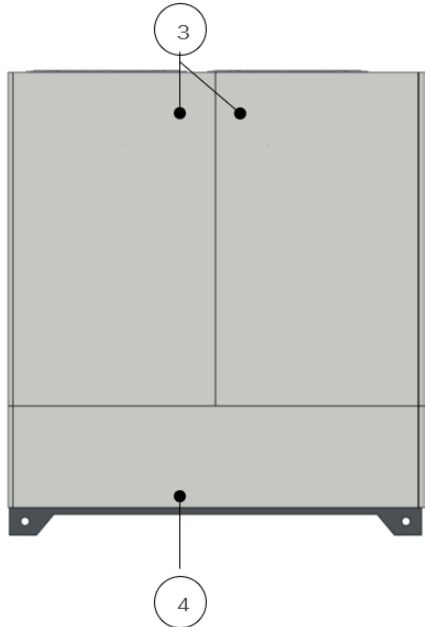
Piping Calculations:

- ⇒ Pipe size: 2-1/2” = 0.255 US gallons/ft (3,2 liter/m)
- ⇒ Pipe size: 2” = 0.163 US gallons/ft (2,0 liter/m)
- ⇒ Pipe size: 1-1/2” = 0.092 US gallons/ft (1,1 liter/m)
- ❗ Take into consideration the amount of required glycol within the Healthcare Application itself.

4.0 Filling the system:

- ⓘ External installed plumbing has been flushed clean. **DO NOT attempt to flush into or pressure-test the chiller reservoir.

Step 1: Remove service panels



Remove the service panels 3 and 4

Step 2: Fill reservoir



Fill the reservoir via the internal filling connection mounted on the top reservoir or you can use a hose to fill directly into the reservoir.

- ⓘ Please note that the isolating valve to the level sensor must also be closed and the cotter pin (if present) removed from the reservoir lid (see below:



⇒ **Factory approved glycol:** Ethylene or Propylene

- ⓘ Permitted are water fluids and mixtures of Water specification defined in Chapter 2.17 Water quality in the operator's manual
- ⓘ The water - glycol mixture ratios specified in the Technical Data *Chapter 1.2* in the operator's manual must always be observed

5.0 Wiring Requirements:

5.1 Power Supply:

cBoxX 60 / 909060846z	
e-cat	E8914KX
Voltage	460V ($\pm 10\%$) / 3~/ 60Hz
Power consumption	27KW
Max over current protection	60A
SCCR	10kA

cBoxX 100 / 909060878z	
e-cat	E8914KY
Voltage	460V ($\pm 10\%$) / 3~/ 60Hz
Power consumption	46KW
Max over current protection	100A
SCCR	10kA

cBoxX 120 / 909060879z	
e-cat	E8914KZ
Voltage	460V ($\pm 10\%$) / 3~/ 60Hz
Power consumption	57.7KW
Max over current protection	100A
SCCR	20kA

- ⇒ Supply wiring must be sized according to local codes and the technical data provided in the chiller manual.
- ⇒ Wiring must be routed through the cut-outs provided in the baseplate, and compressor mount. To protect your wiring, all wires should pass through the rubber grommets.

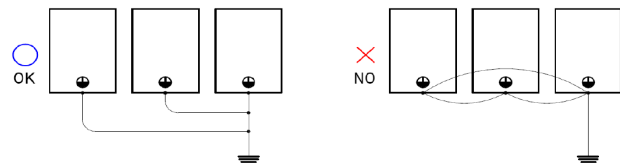
5.2 Grounding:

- ⇒ Proper isolation of the wiring for the control and power circuits and shielding of cables is required.
- ⇒ A large contact area is necessary for low-impedance grounding of HF interference. As such, the use of grounding straps instead of cables is advised.
- ⇒ Moreover, cable shields must be connected with purpose-made ground clips. The grounding surface must be highly conductive bare metal. Remove any coats of varnish and paint.
- ⇒ The grounding wire must be sized in accordance with local regulations, and at minimum, the same gauge wire as connected to the main power supply. **The grounding must be connected to the ground terminal in the main electrical cabinet of the chiller.** The ground resistance must be less than 5 Ohms.
- ⇒ Metal cable conduits are not allowed for grounding. The piping of the chiller (supply and return) must also be grounded.

❗ Do not share the ground wire with other devices.

❗ Always use a ground wire that complies with technical standards for electrical equipment and minimizes the length of the ground wire.

❗ When using more than one Inverter, be careful not to loop the ground.



5.3 Data Cable – Remote display:

- ⇒ Communication lines and load lines must be laid at least 10 cm apart.
- ⇒ 1” conduit must be provided from the chiller to the MRI control room to allow for pulling the provided 4 wire cable (50 m long) for connecting the chiller to the remote display panel
- ⇒ The remote display panel (indoor installation only) controls the complete function of the controller in the main chiller.
- ⇒ If total length exceeds 164’ (50m), a long-distance remote cable (KKT# M506106 – Americas only) must be installed. Splicing is **NOT** allowed

6.0 Options and Accessories

6.1 Chiller Interface Panel (CIP)

(CIP1 9090000072) for cBoxX 60

(CIP2 9090000107) for cBoxX 100 + 120



Weight

	CIP 1 (9090000072)	CIP 2 (9090000107)
Net (Empty) weight CIP:	Approx. 123,5 lbs. (56 kg)	Approx. 154,4 lbs. (70 kg)
Gross Weight (Operation – Wet):	Approx. 134,5 lbs. (61 kg)	Approx. 169,8 lbs. (77 kg)
Transport weight:	Approx. 209,5 lbs. (95 kg).	Approx. 240,3 lbs. (109 kg)

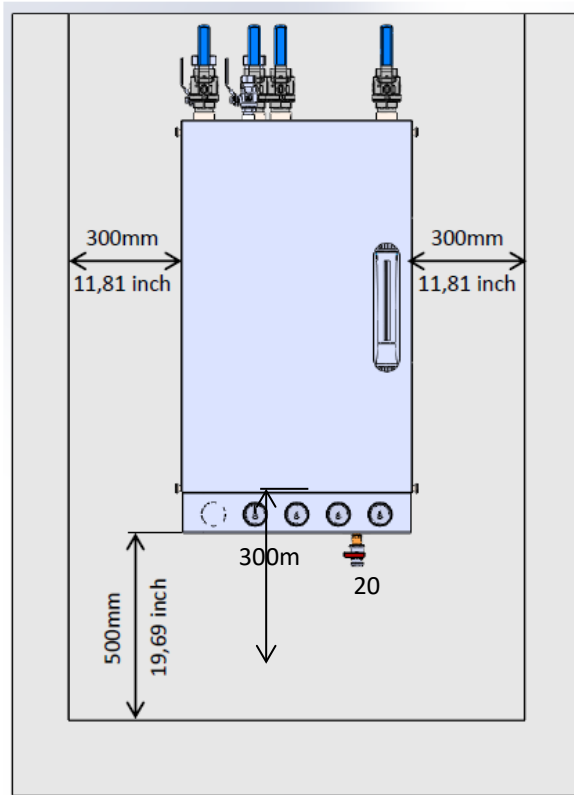
Dimensions

	CIP 1 (9090000072)	CIP 2 (9090000107)
Depth:	Approx. 14 in. (346 mm)	
Width:	Approx. 24 in. (610 mm).	
Height:	Approx. 43 in. (1.100 mm).	
Width (Incl. mounting screws):	Approx. 25 in. (644 mm)	
Height (open valves)	Approx. 53 in. (1352 mm)	Approx. 54 in. (1364 mm)

Clearance:

- ⇒ Maintain at least **20 in. (500 mm)** from the top and bottom of the CIP.
- ⇒ Maintain at least **12 in. (300 mm)** from the left and right side of the CIP.
- ⇒ Maintain at least **40 in. (1,000mm)** from the front of the CIP for servicing.

Please note: Observe the minimum clearance in front of the panel for service access as indicated in the drawing below.



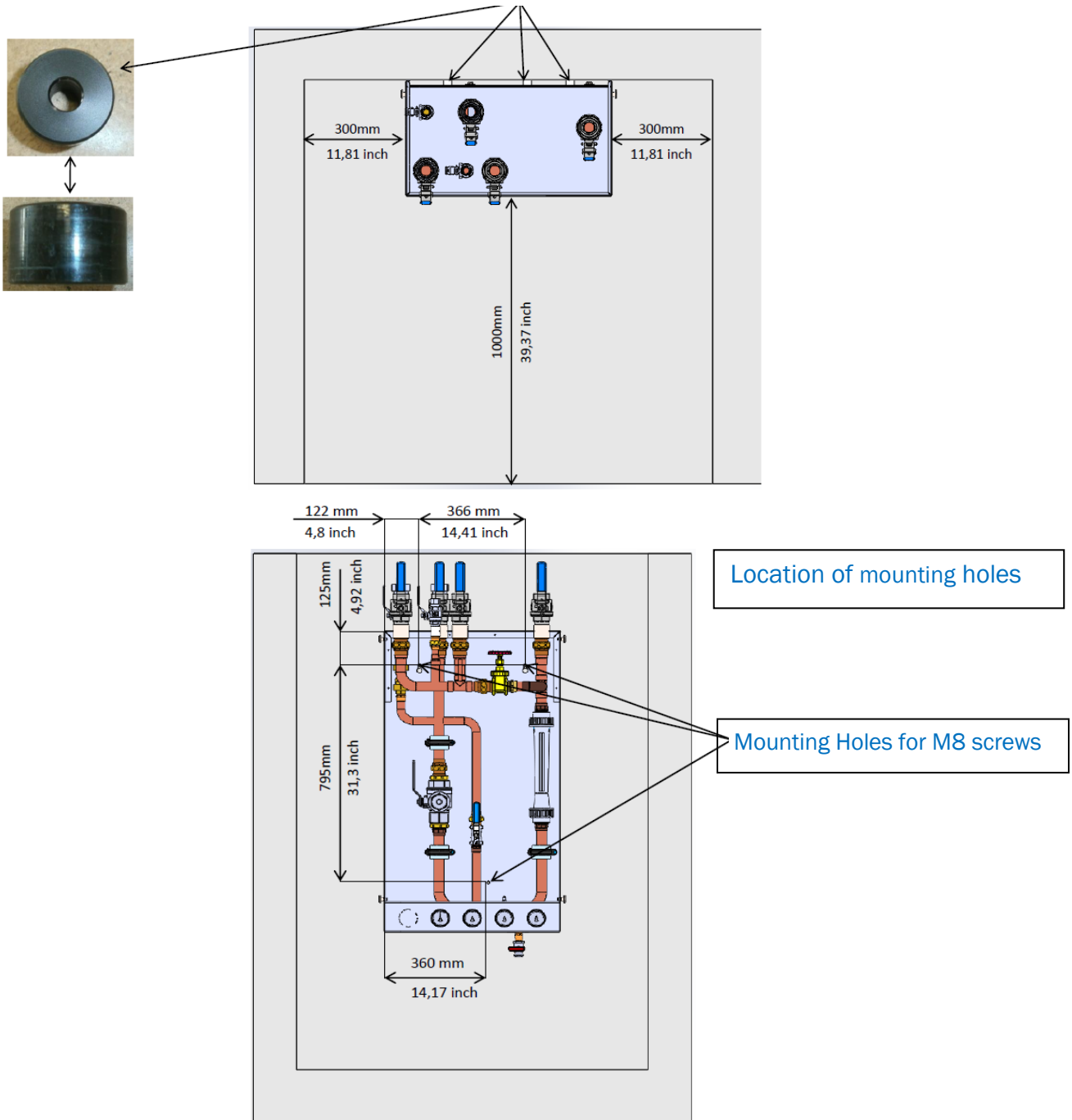
Note: Use provided spacers (3 qty.) for wall mounting. **Note:** The figure represented is an example only, and may not represent actual installation conditions

Mounting Instructions CIP

- ⇒ Mount the CIP to the wall using mounting screws and plastic spaces provided. Review the installation and operation instructions provided with the CIP panel for further information

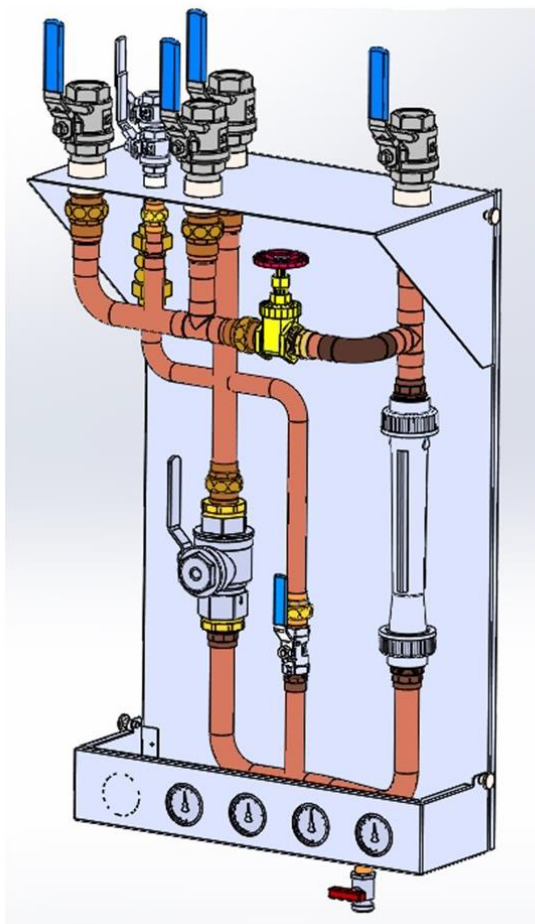
Please note: Observe the minimum clearance in front of the panel for service access as indicated in the drawing below.

Note: Use provided spacers (3 qty.) for wall mounting.



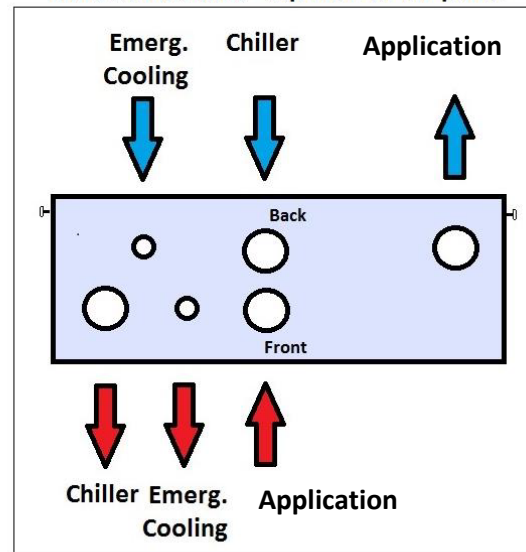
Fluid Connections CIP

	CIP 1 (9090000072)	CIP 2 (9090000107)
Connection to chiller (In/Out):	1½" NPT (F)	2" NPT (F)
Connection to the HEC (In/Out):	1½" BSP (F)	2" BSP (M)
Connection to emergency cooling	¾" NPT (F)	¾" NPT (F)
Connection for Drain	½" hose connector	½" hose connector



↓
Drain

Fluid connections - top view of CIP panel



6.2 Remote Control Panel

Mounting instructions and connection of Remote display panel:

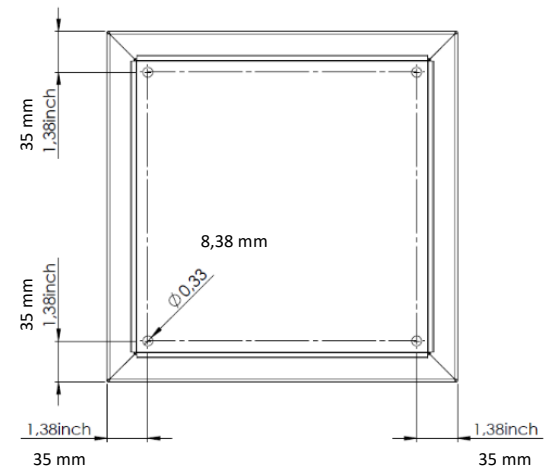
Dimensions:

- ⇒ **Depth:** Approx. 12 in. (300 mm)
- ⇒ **Width:** Approx. 12 in. (300 mm)
- ⇒ **Height:** Approx. 5 in. (120 mm)

1. Remote display should be mounted near the desk in the MRI control room.

- ❗ Use of proper screw type designed for your specific mounting surface (wood, concrete, etc.) is required.
- ❗ Recommended screw size M8

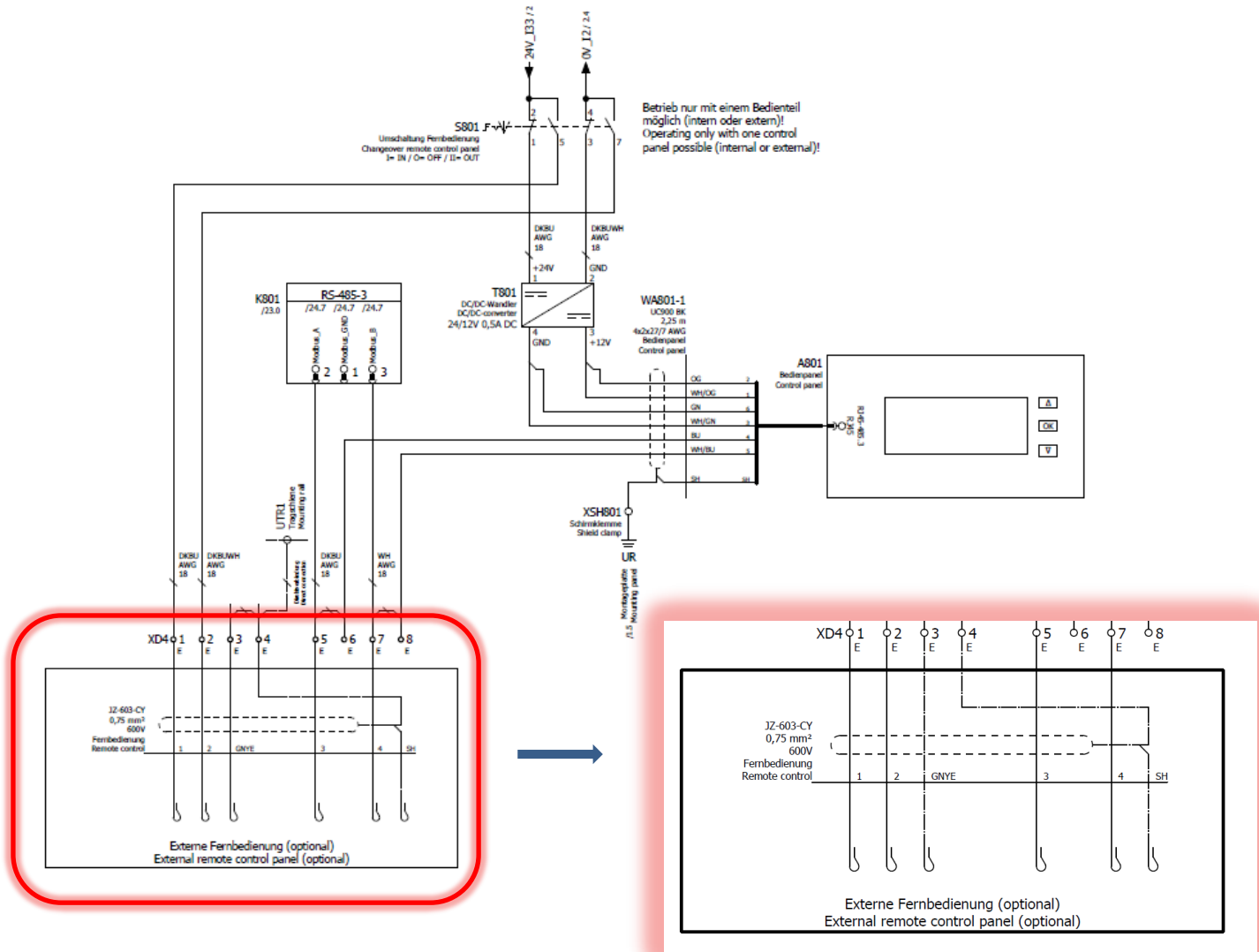
2. The provided 4 wire transfer cable (164' / 50 m) must be pulled from the chiller and connected to the **remote display** in the MRI Control room (see diagrams below).



Circuit Overview

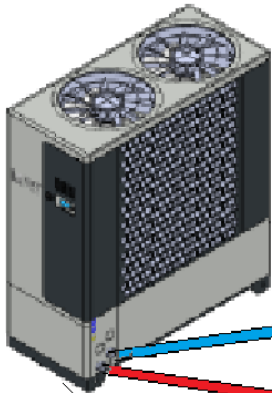
- ❗ Data transfer cable needs to be placed in 1" conduit.
- ❗ Please, use this conduit for transfer cable **ONLY** and **NOT** for power supply.
- ❗ If total length exceeds 164' (50m), a long-distance remote cable (KKT# M506106) must be installed. Splicing is **NOT** allowed
- ❗ **Important note:** Check if your chiller version has the X4 terminal or XD4 terminal as indicated in the drawing above before landing the wiring connections for the remote display.

Connection to XD4 terminal at the chiller



Outside

Chiller location TBD by customer / contractor



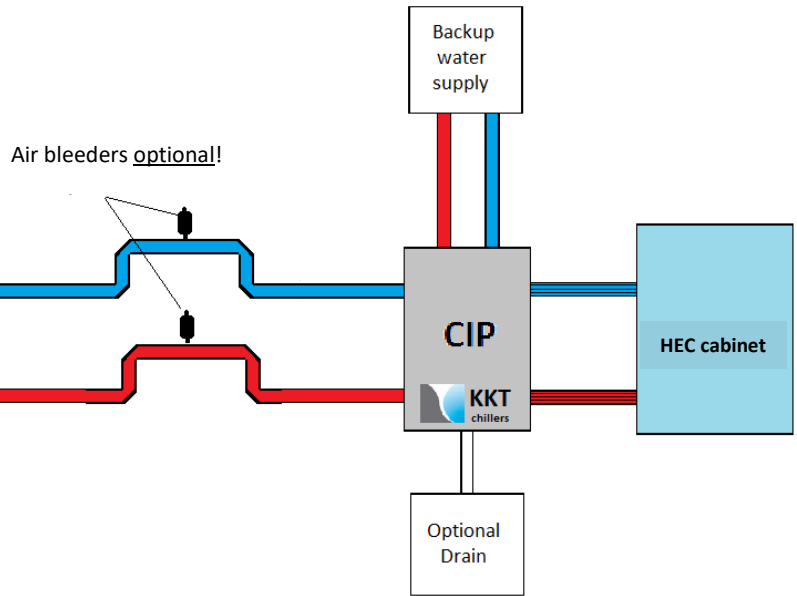
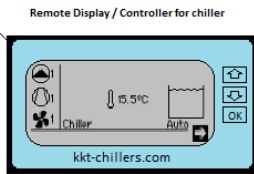
KKT chillers
KKT chiller models
cBoxX 60, 100 + 120

Equipment Room

Refer to Installation guidelines and operation manual for additional installation guidelines and requirements.

Air bleeders optional!

Customer / contractor to mount remote display to wall in MRI control room. Cable provided with chiller and installed by customer / contractor.



6.0 Pre-Startup Requirements:

- ① The Startup must be scheduled no less than 5 business days in advance of the requested startup date. The Pre-Startup checklist must be completed and returned prior to scheduling.
- ① The Startup visit will be conducted within standard business hours (Monday thru Friday 8:00 AM – 5:00 PM). Weekends and after-hours Startup service may be available at an additional charge.
- ① 4 hours is allotted for the completion of this service. If the Startup is delayed due to the site not being adequately prepared, additional charges may apply. If a return visit is necessary, our technician will be scheduled to return to the site as soon as possible based upon availability.
- ① Automatic air bleeders must be installed as detailed in the installation manual.
- ① The Mechanical Contractor responsible for the Electrical and Piping installation must be on site during the Startup visit.
- ① The site's plumbing lines must be flushed before connecting the chiller. Additionally, all lines must be leak checked with pressurized air (no water) prior to the arrival of KKT's technician.
- ① All wiring must be installed, and connections made prior to our arrival. Additionally, safety disconnects must be installed and tested.
- ① The recommended glycol and water must be at the filling point. Glycol (KKT Protect) is available for purchase from KKT chillers at an additional charge.
- ① A water source must be available within close proximity (i.e.; garden hose attached to a building water supply) for maintenance purposes.
- ① The KKT technician will verify the chiller installation was completed per our manufacturers' guidelines, and will complete the Startup checklist while onsite.

For the checklists “start-up chiller” please contact the respective KKT service office.

For questions or technical support, please contact:

<p>Service EMEA / ROW</p>	<p>ait-deutschland GmbH Industriestraße 3 95359 Kasendorf Deutschland T +49 9228 9977 7190 * F +49 9228 9977 7474 E service@kkt-chillers.com W www.kkt-chillers.com</p>
<p>Service Americas</p>	<p>KKT chillers, Inc. 765 Dillon Drive Wood Dale IL 60191</p> <p>Service</p> <ul style="list-style-type: none"> • PH: 877.994.0991 • kkt-service@kkt-chillersusa.com <p>Technical Support</p> <ul style="list-style-type: none"> • PH: 833.KKT.HELP (833.558.4357) • techsupport@kkt-chillersusa.com
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