cBoxX SERIES

SIEMENS Healthineers

INSTALLATION GUIDELINES

cBoxX 40
cBoxX 60
cBoxX 80
cBoxX 100
cBoxX 120

Document Revision History

Version	Date:	Type of Change	Who
R1.0	10.15.21	Customer specific - Installation Guidelines creation - version R1.0	JC
R1.1	10.15.21	Revision of the P&ID – **1.7. External filling port locations**	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.
- ⇨ Leveling feet (see pic below) are used for vibration isolation and height adjustment. **ROW only!**

- ⇨ Anchoring feet (see below) are used for direct anchoring to a concrete foundation or rooftop framework. **AMERICAS installations only!**

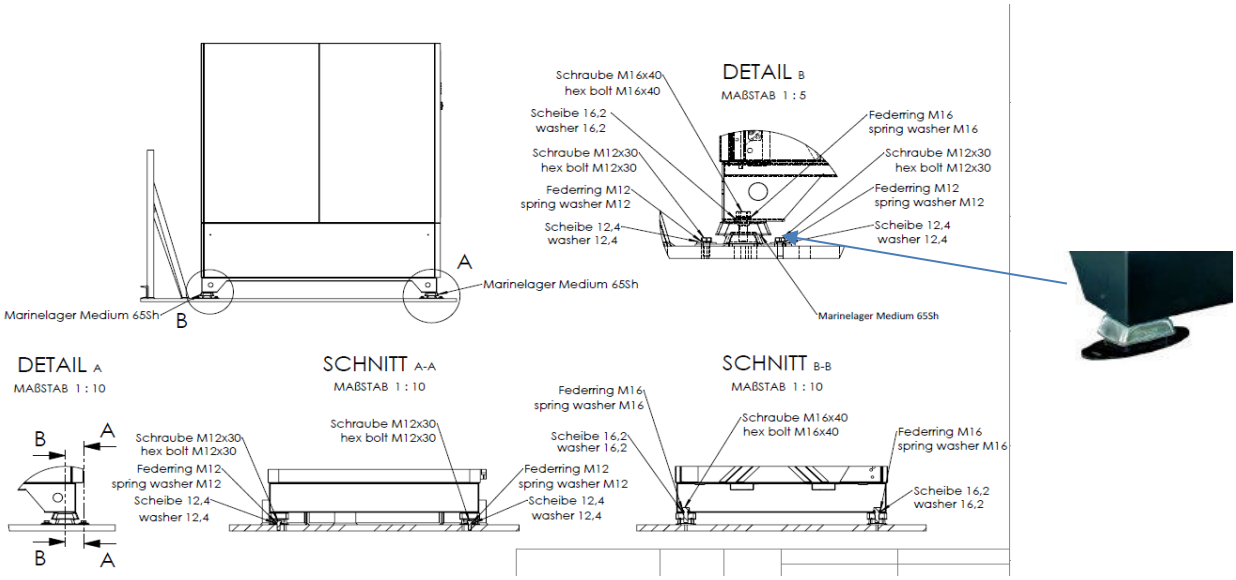
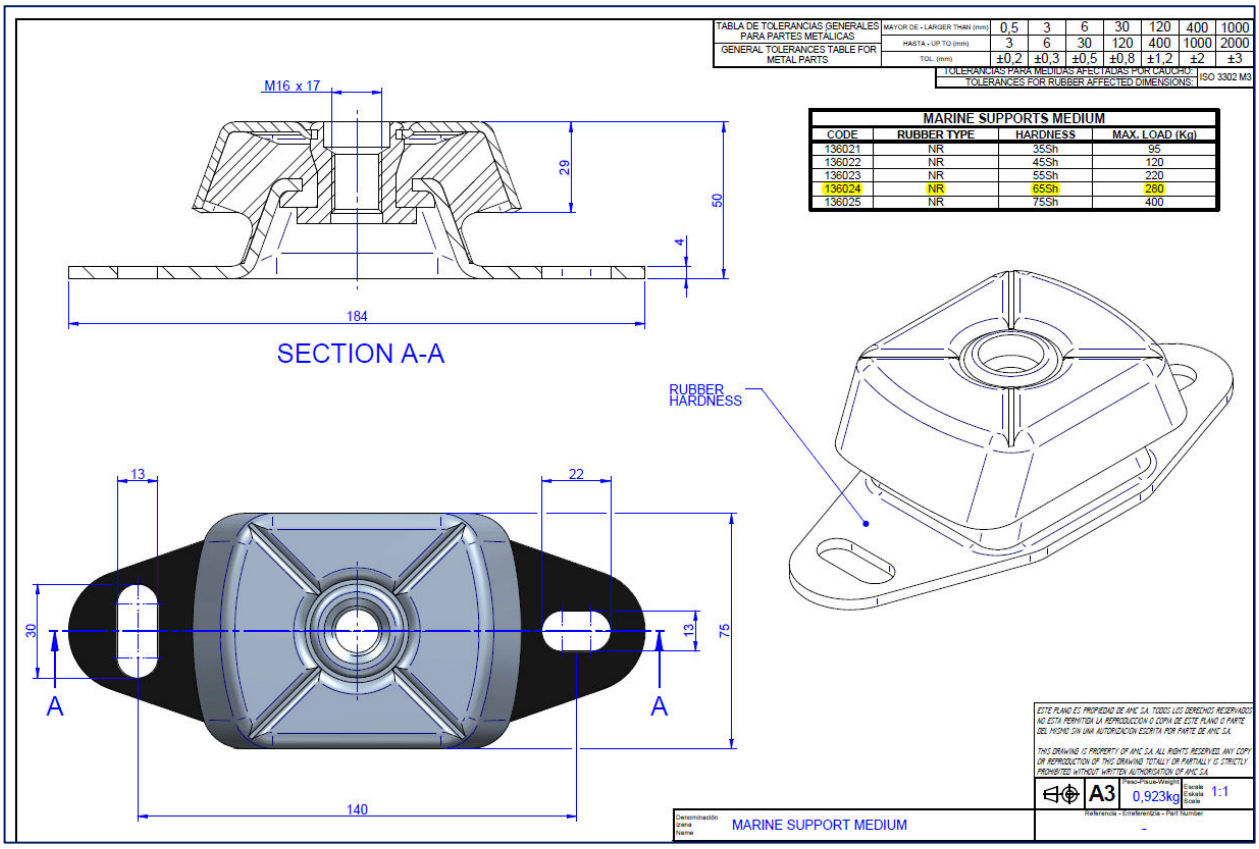


Table 4 Anchor Capacities

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"



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

1.2 Minimum Pad Dimensions:

- **cBoxX 40:** Approx. 57in. (1448mm) long by 41 in. (1041mm) wide.
- **cBoxX 70, 80 and 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 40	cBoxX 70 / 80	cBoxX 100	cBoxX 120
Net (Empty / Dry) Weight:	1.058 lbs. (480kg)	1.499 lbs. (680kg)	1.653 lbs. (750kg) *	2.306 lbs. (1.046kg)
Gross (Operating / Wet) Weight:	1.168 lbs. (530kg)	1.609 lbs. (730kg)	1.763 lbs. (800kg) *	2.645 lbs. (1.200kg)
Transport. (Crated) Weight:	1.488 lbs. (675kg)	1.929 lbs. (875kg)	2.083 lbs. (945kg) *	3196 lbs. (1.450kg)

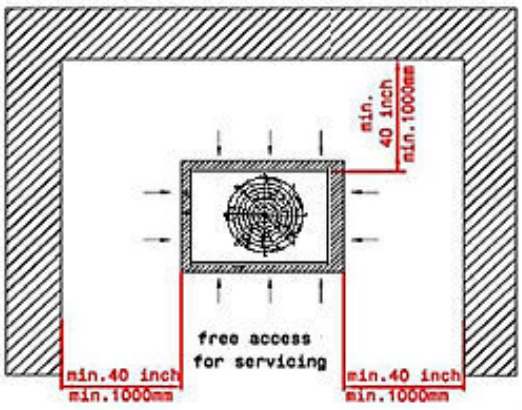
1.4 Installation Clearance: cBoxX 40, 70, 80,100 and 120

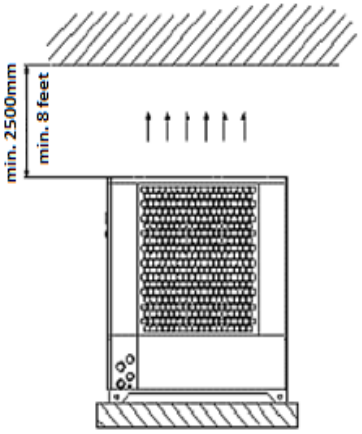
ⓘ Maintain <u>at least</u> 40 in. (1000mm) around all four sides of the chiller for air circulation and servicing.

ⓘ Maintain at least 8 feet clearance (2500mm) above the chiller to allow proper discharge of warm air from the chiller.

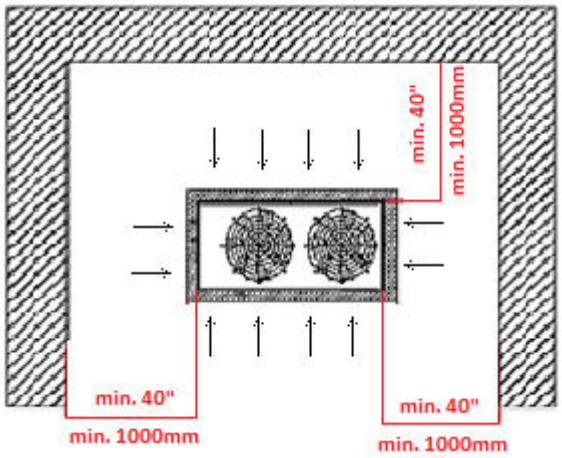
cBoxX 40 + 60

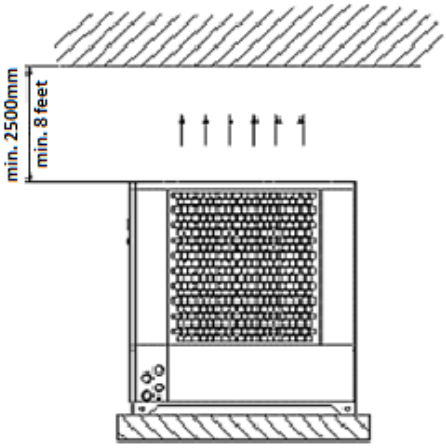
:



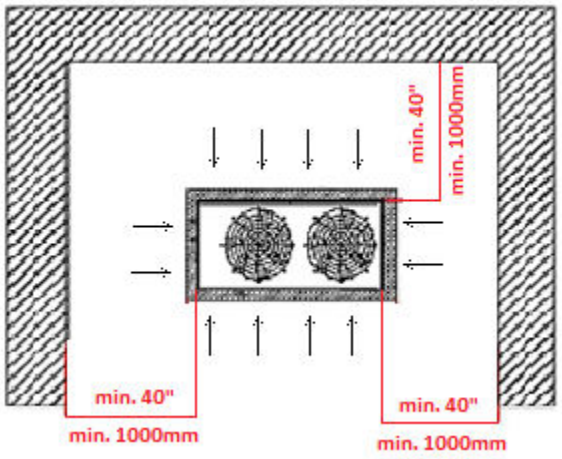


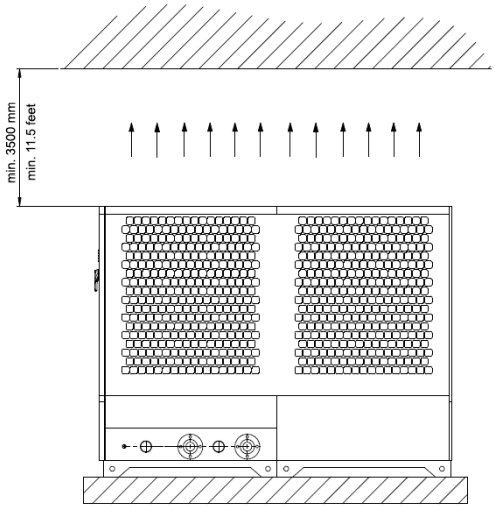
cBoxX 70, 80 and 100





cBoxX 120





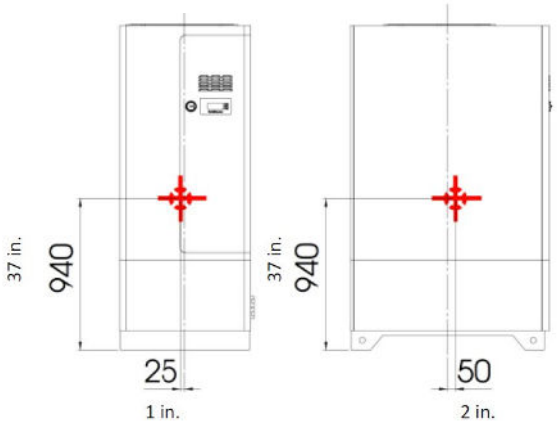
1.5 Transporting and Rigging

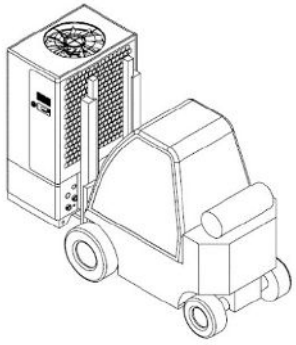
CRATE DIMENSIONS (approx.):

Chiller	Length	Width	Height
cBoxX 40	57” (1357mm)	38” (967mm)	89” (2249mm)
cBoxX 70 / 80 /100	77” (1956mm)	38” (967mm)	89” (2249mm)
cBoxX 120	111” (2816mm)	53” (1344mm)	89” (2254mm)

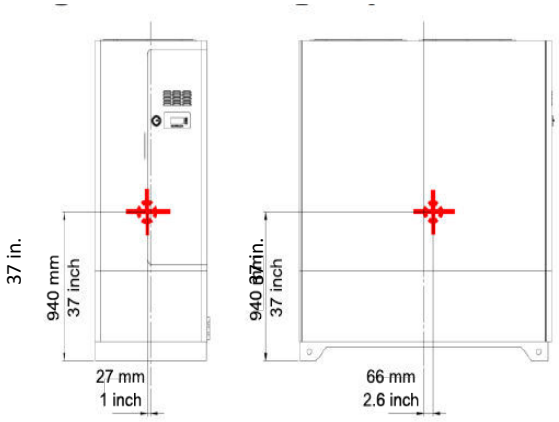
ⓘ You will also need to consider the height of the transport equipment (pallets, lift truck, transport rollers, etc.)

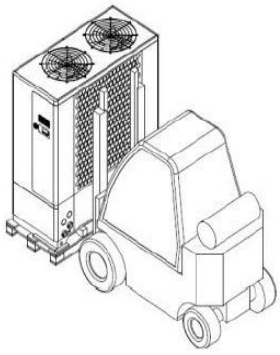
cBoxX 40 + 60





cBoxX 80 + 100





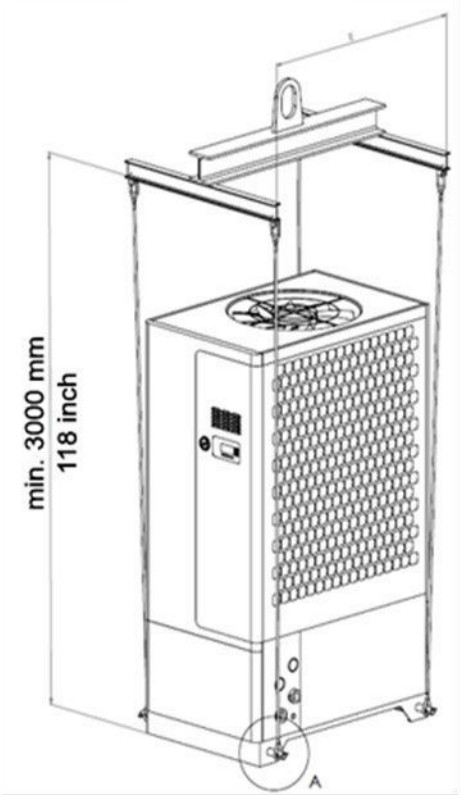
1.6 Crane Transport:

ⓘ If a crane will be used to transport the chiller, please note the following:

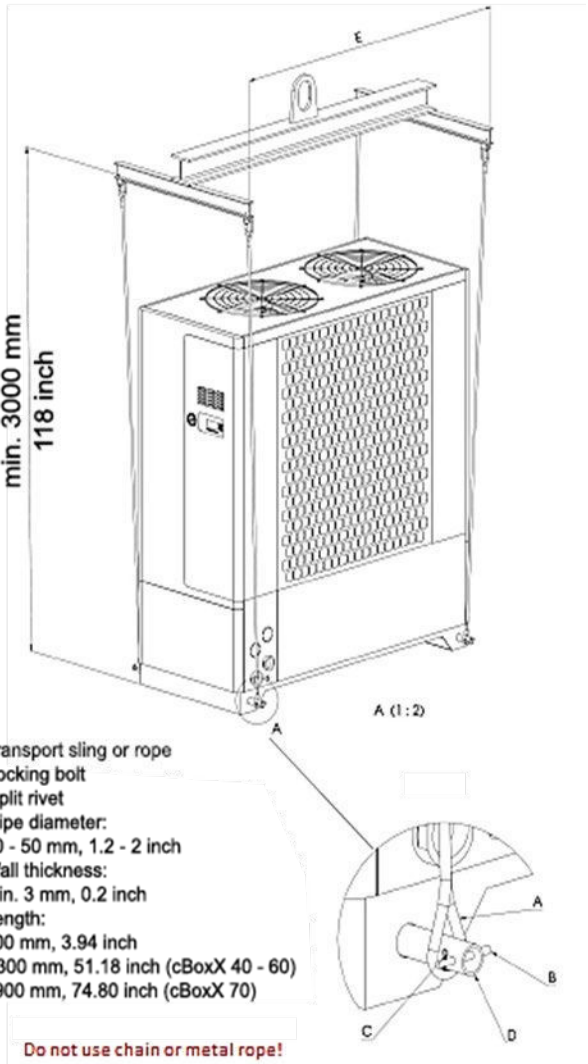
- ⇨ Lift the chiller **only** from its base. Insert two steel rods through the holes in the base. Rods must be specifically designed for this purpose, and able to support the weight of the unit (see chart).
- ⇨ Secure the rods with locking pins to prevent shifting. Use only lifting straps or rope for 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, must ***not*** be used for the cBoxX40…cBoxX100!!

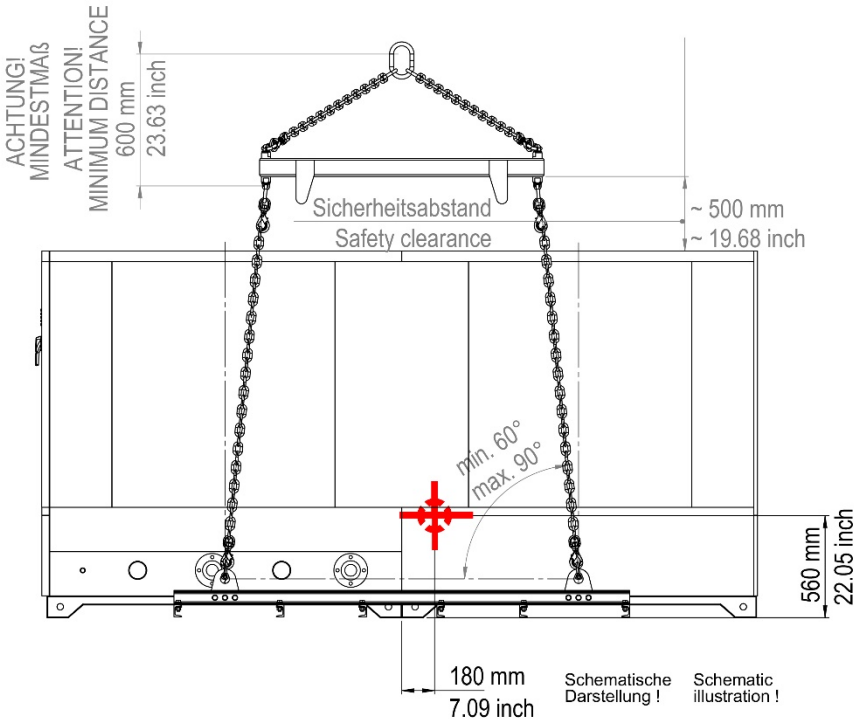
cBoxX 40

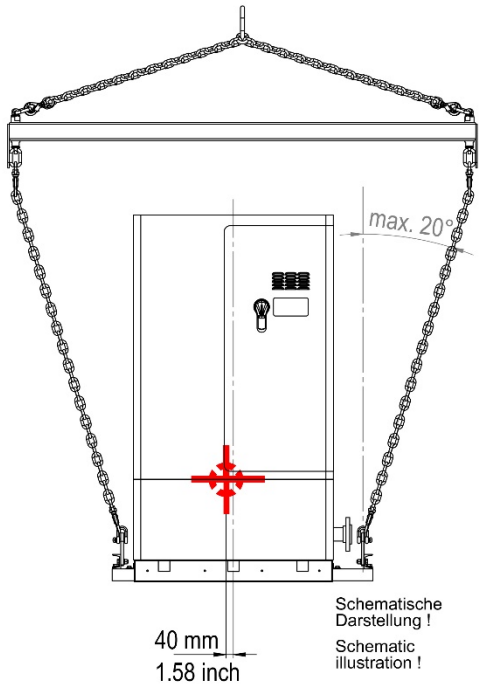


cBoxX 70, 80 and 100



cBoxX 120


ACHTUNG!
MINDESTMAß
ATTENTION!
MINIMUM DISTANCE
600 mm
23.63 inch
Sicherheitsabstand
Safety clearance
~ 500 mm
~ 19.68 inch
min. 60°
max. 90°
560 mm
22.05 inch
180 mm
7.09 inch
Schematische Darstellung !
Schematic illustration !


max. 20°
40 mm
1.58 inch
Schematische Darstellung !
Schematic illustration !

Piping and Installation

2.0 System design

- 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.

2.1 Piping Materials Allowed

- 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.
- ***Never*** use galvanized piping!
- 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
- Maximum allowed elbows in total piping run is ~ 20 pcs.
- Long radius elbows must be used.
- If the installation differs from the maximum permitted installation height above or below the application, please contact the KKT team.

2.2 Relation of Pipe Diameter to Distance between Chiller and Siemens scanners / SEP

	cBoxX 40 909040-00743(z) | 909040-00744(z)	
Siemens Healthineers CT Scanners type(s)	**Replacement chiller for the discontinued KPC 108** that's used for the CTs: SOMATOM Definition Edge / AS / Flash / Force / Drice / Biograph mCT	
Max allowed elevation above sea level	2000m / 6,562ft	
Inlet / outlet chiller connections	1½" NPT (Americas) G 1½" 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)	0,6 bar	
Max inlet pressure (Siemens scanner)	6,0 bar	
Estimated pressure drop across the Siemens scanner	2,05 bar @ 3,0 m³/h	
Max permitted vertical distance – chiller **above** Siemen's scanner	15m / 49.2ft	
Max permitted vertical distance – chiller **below** Siemen's scanner	15m / 49.2ft	
One way pipe diameter <50m (less than)	1½"	
One way pipe diameter >50 (max 100m)	2"	
Filling pressure (STATIC) to be read in the general location of the **internal** expansion vessel/tank. Please take into account the installed location of the chiller (above or below the Siemens scanner)	Chiller **below** the MRI / CT (bar)	Chiller **above** MRI/CT (bar)
0 - 2.5m (0 – 8.2ft)	0.5(1) | 1.15(2)	0.5(1) | 1.15(2)
5m (16.4ft)	0.5(1) | 1.15(2)	0.5(1) | 1.15(2)
7.5m (24.6ft)	0.5(1) | 1.15(2)	0.5(1) | 1.15(2)
10m (32.8ft)	0.5(1) | 1.35(2)	0.5(1) | 1.1(2)
12.5m (41ft)	1.0(1) | 1.65(2)	0.5(1) | 1.05(2)
15m (49.2ft)	1.2(1) | 1.9(2)	0.5(1) | 1.0(2)
	(1) Filling (STATIC) pressure Exp. vessel at operating temperature 10-20°C before filling the system. (2) Chiller filling (STATIC) pressure (pressure sensor cooling inlet) in non-operating mode all values +/-0.05bar	

	cBoxX 40 909040-00743(z) | 909040-00744(z)	
Siemens Healthineers Radiation Therapy type(s)	**Replacement chiller for the discontinued KPC 115** that's used for Radiation Therapy applications: Primus PLUS, Oncor Impression PLUS, Oncor Avant-Garde, Artiste	
Max allowed elevation above sea level	2000m / 6,562ft	
Inlet / outlet chiller connections	1½" NPT (Americas) G 1½" 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)	0,6 bar	
Max inlet pressure (Siemens scanner)	6,0 bar	
Estimated pressure drop across the Siemens scanner	2,4 bar @ 1,7 m³/h	
Max permitted vertical distance – chiller **above** Siemen's scanner	15m / 49.2ft	
Max permitted vertical distance – chiller **below** Siemen's scanner	15m / 49.2ft	
One way pipe diameter <50m (less than)	1½"	
One way pipe diameter >50 (max 100m)	2"	
Filling pressure (STATIC) to be read in the general location of the **internal** expansion vessel/tank. Please take into account the installed location of the chiller (above or below the Siemens scanner)	Chiller **below** the MRI / CT (bar)	Chiller **above** MRI/CT (bar)
0 - 2.5m (0 – 8.2ft)	0.5(1) | 1.15(2)	0.5(1) | 1.15(2)
5m (16.4ft)	0.5(1) | 1.15(2)	0.5(1) | 1.15(2)
7.5m (24.6ft)	0.5(1) | 1.15(2)	0.5(1) | 1.15(2)
10m (32.8ft)	0.5(1) | 1.35(2)	0.5(1) | 1.1(2)
12.5m (41ft)	1.0(1) | 1.65(2)	0.5(1) | 1.05(2)
15m (49.2ft)	1.2(1) | 1.9(2)	0.5(1) | 1.0(2)
	(1) Filling (STATIC) pressure Exp. vessel at operating temperature 10-20°C before filling the system. (2) Chiller filling (STATIC) pressure (pressure sensor cooling inlet) in non-operating mode all values +/-0.05bar	

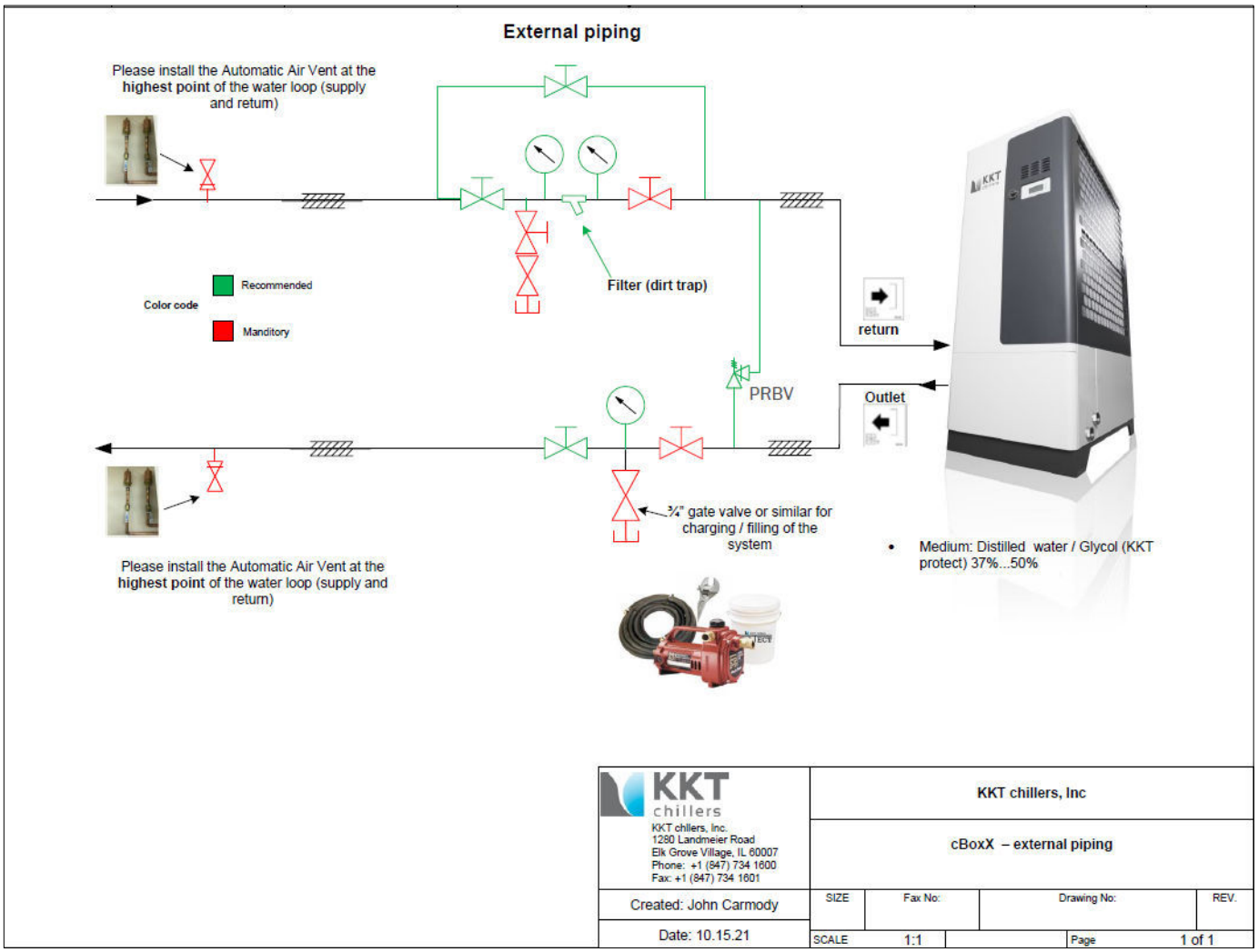
	cBoxX 70 909070-00249z / 909070-00249z	**cBoxX 80** 909080-00284(z) / 909080-00529(z)
Siemens Healthineers MRI type(s)	**MRI system:** Magnetom Aera XJ, Magnetom Sola XJ Magnetom Altea XJ	
Max allowed elevation above sea level	2000m / 6,562ft	
Inlet / outlet chiller connections	2" NPT (Americas) 2" BSP (ROW)	
Max 90° "long radius" elbows	10 one way (or 20 max)	
Cooling medium	Water / Glycol (KKT protect) 37…50%	
Min. return pressure (suction side of chiller pump)	0,6 bar	
Max inlet pressure (Siemens scanner)	6,0 bar	
Estimated pressure drop across the Siemens SEP	1,0 bar @ 6,0 m^3/h	
Max permitted vertical distance – chiller **above** Siemens SEP	30m / 98.4ft	
Max permitted vertical distance – chiller **below** Siemens SEP	15m / 49.2ft	
One way pipe diameter <50m (less than)	2"	
One way pipe diameter >50 (max 100m)	2"	
Filling pressure (STATIC) to be read in the general location of the **internal** expansion vessel/tank. Please take into account the installed location of the chiller (above or below the Siemens SEP)	Chiller **below** the MRI/SEP (bar)	Chiller **above** MRI/SEP (bar)
0 - 2.5m (0 – 8.2ft)	0.5(1) | 1.0(2)	0.5(1) | 1.0(2)
5m (16.4ft)	0.5(1) | 1.0(2)	0.5(1) | 1.0(2)
7.5m (24.6ft)	0.5(1) | 1.0(2)	0.5(1) | 1.0(2)
10m (32.8ft)	0.7(1) | 1.25(2)	0.5(1) | 1.0(2)
12.5m (41ft)	1.0(1) | 1.5(2)	0.5(1) | 1.05(2)
15m (49.2ft)	1.2(1) | 1.8(2)	0.5(1) | 1.0(2)
17.5m		0.5(1) | 1.0(2)
20m		0.5(1) | 1.0(2)
≥ 20m		0.5(1) | 1.0(2)
	(1) Filling (STATIC) pressure Exp. vessel at operating temperature 10-20°C before filling the system. (2) Chiller filling (STATIC) pressure (pressure sensor cooling inlet) in non-operating mode all values +/-0.05bar	

	cBoxX 100 909100-00218(z) | 909100-00510(z) 909100-00468(z) | 909100-00469(z) 909100-00470(z)	
Siemens Healthineers MRI type(s)	**MRI system:** Magnetom Avanto (Fit), Magnetom Aera (XQ) Magnetom Prisma, Magnetom Prisma (Fit) Magnetom Skyra, Magnetom Sola (XQ) Magnetom Vida, Magnetom Lumina	
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 max)	
Cooling medium	Water / Glycol (KKT protect) 37...50%	
Min. return pressure (suction side of chiller pump)	0,6 bar	
Max inlet pressure (GE HEC)	6,0 bar	
Estimated pressure drop across the Siemens SEP	1,0 bar @ 6,0 m³/h	
Max permitted vertical distance – chiller **above** Siemens SEP	30m / 98.4ft	
Max permitted vertical distance – chiller **below** Siemens SEP	15m / 49.2ft	
One way pipe diameter <50m (less than)	2"	
One way pipe diameter >50 (max 100m)	2"	
Filling pressure (STATIC) to be read in the general location of the **internal** expansion vessel/tank. Please take into account the installed location of the chiller (above or below the Siemens SEP)	Chiller **below** the MRI / CT (bar)	Chiller **above** MRI/CT (bar)
0 - 2.5m (0 – 8.2ft)	0.5(1) | 1.0(2)	0.5(1) | 1.0(2)
5m (16.4ft)	0.5(1) | 1.0(2)	0.5(1) | 1.0(2)
7.5m (24.6ft)	0.5(1) | 1.0(2)	0.5(1) | 1.0(2)
10m (32.8ft)	0.7(1) | 1.25(2)	0.5(1) | 1.0(2)
12.5m (41ft)	1.0(1) | 1.5(2)	0.5(1) | 1.05(2)
15m (49.2ft)	1.2(1) | 1.8(2)	0.5(1) | 1.0(2)
17.5m		0.5(1) | 1.0(2)
20m		0.5(1) | 1.0(2)
≥ 20m		0.5(1) | 1.0(2)
	(1) Filling (STATIC) pressure Exp. vessel at operating temperature 10-20°C before filling the system. (2) Chiller filling (STATIC) pressure (pressure sensor cooling inlet) in non-operating mode all values +/-0.05bar	

	cBoxX 120 909120-00313(z) / 909120-00528(z) 909120-00471(z) | 909120-00472(z)	
Siemens Healthineers MRI type(s)	**MRI system:** Magnetom Vida (XT) **MRI/PET System:** Biograph mMR	
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)	0,6 bar	
Max inlet pressure (GE HEC)	6,0 bar	
Estimated pressure drop across the Siemens SEP	1,0 bar @ 6,0 m^3/h	
Max permitted vertical distance – chiller **above** Siemens SEP	30m / 98.4ft	
Max permitted vertical distance – chiller **below** Siemens SEP	15m / 49.2ft	
One way pipe diameter <50m (less than)	2"	
One way pipe diameter >50 (max 100m)	2"	
Filling pressure (STATIC) to be read in the general location of the **internal** expansion vessel/tank. Please take into account the installed location of the chiller (above or below the Siemens SEP)	Chiller **below** the MRI / CT (bar)	Chiller **above** MRI/CT (bar)
0 - 2.5m (0 – 8.2ft)	0.5(1) | 1.0(2)	0.5(1) | 1.0(2)
5m (16.4ft)	0.5(1) | 1.0(2)	0.5(1) | 1.0(2)
7.5m (24.6ft)	0.5(1) | 1.0(2)	0.5(1) | 1.0(2)
10m (32.8ft)	0.7(1) | 1.25(2)	0.5(1) | 1.0(2)
12.5m (41ft)	1.0(1) | 1.5(2)	0.5(1) | 1.05(2)
15m (49.2ft)	1.2(1) | 1.8(2)	0.5(1) | 1.0(2)
17.5m		0.5(1) | 1.0(2)
20m		0.5(1) | 1.0(2)
≥ 20m		0.5(1) | 1.0(2)
	(1) Filling (STATIC) pressure Exp. vessel at operating temperature 10-20°C before filling the system. (2) Chiller filling (STATIC) pressure (pressure sensor cooling inlet) in non-operating mode all values +/-0.05bar	

1.7 External filling port locations

cBoxX 40, 70, 100 and 120
(Please note that size of the main inline valves should be based on the connection size of the chiller)



3.0 Technical Requirements

3.1 Glycol

- ⇨ The cBoxX chillers require a water/ glycol mixture of 35 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 glycol 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.

3.2 Air Vents:

- ⇨ Please ensure that air vents are placed at the **highest point** of the water loop in supply and return line.

Example of automatic air vent:

KKT#: 654936
Description: Air vent - EA122A1002

4.0 Wiring Requirements:

4.1 Power Supply:

cBoxX 40 / 909040 -		
	00743	00744
Main Power	460V/3~/60Hz	460V/3~/60Hz
Max over current protection	35 A	35 A

cBoxX 70 or 80 / 909070_80 -		
	00284	00529
Main Power	400V/3~/50Hz	380V/3~/60Hz
Max over current protection	80 A	80 A

cBoxX 100 / 909100 –					
	00218	00468	00469	00470	00510
Main Power	400V/3~/50Hz	460V/3~/60Hz	460V/3~/60Hz	460V/3~/60Hz	380V/3~/60Hz
Max over current protection	100 A	100 A	100 A	100 A	100 A

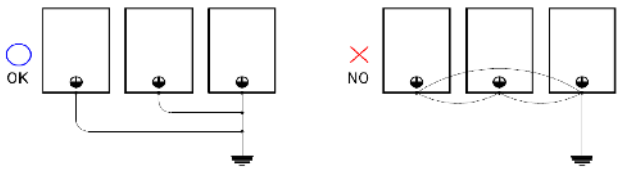
cBoxX 120 / 909120 –				
	00313	00471	00472	00528
Main Power	400V/3~/50Hz	460V/3~/60Hz	460V/3~/60Hz	380V/3~/60Hz
Max over current protection	100 A	100 A	100 A	125 A

- ⇨ 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.

4.2 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.**

4.3 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

5.0 Options and Accessories

5.1 Chiller Interface Panel (CIP)

(CIP1 909000.0072) for cBoxX 40

(CIP2 909000.0107) for cBoxX 80 - 100 – 120 – 160 – 180

Weight

	CIP 1 (909000.0072)	CIP 2 (909000.0107)
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)

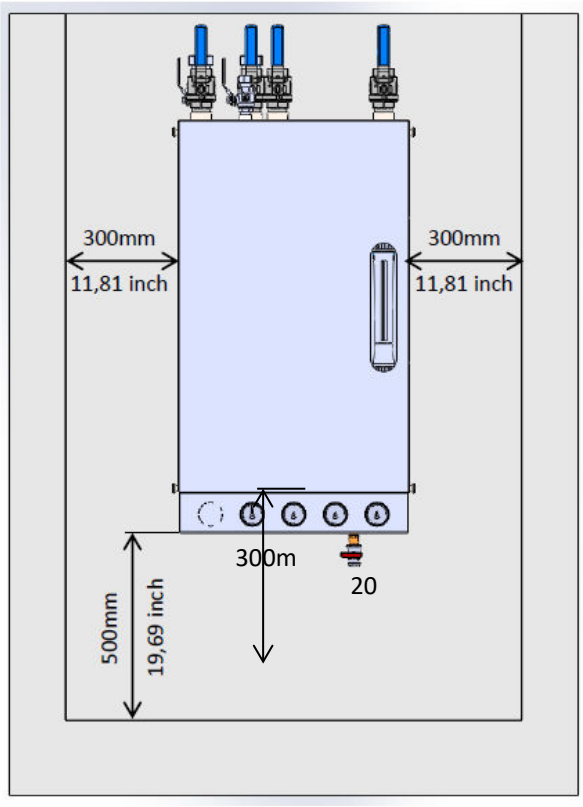
Dimensions

	CIP 1 (909000.0072)	CIP 2 (909000.0107)
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.** (1,000**mm**) 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.



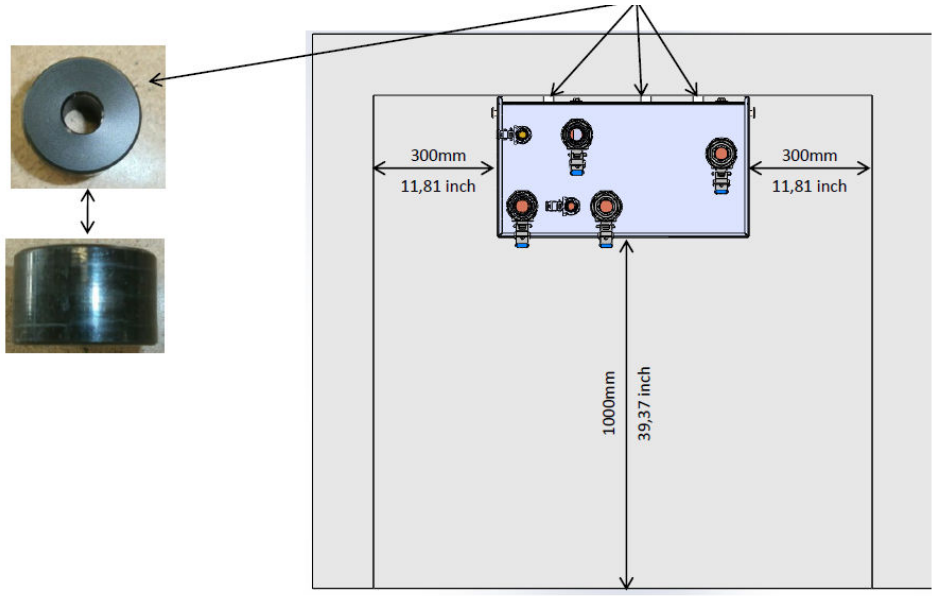
Note: Use provided spacers (3 qty.) for wall mounting. **Note:** The figure represented is an example only, and may not represent actual installation conditions

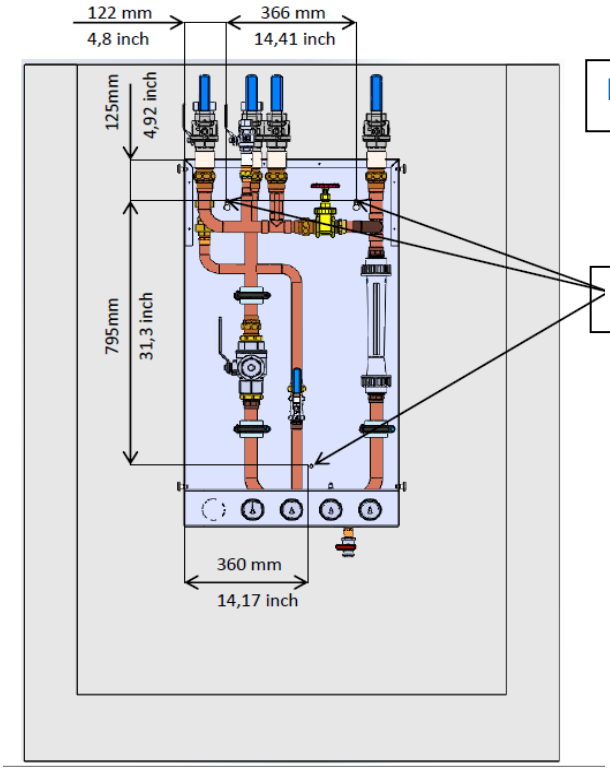
Mounting Instructions CIP

⇨ 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.

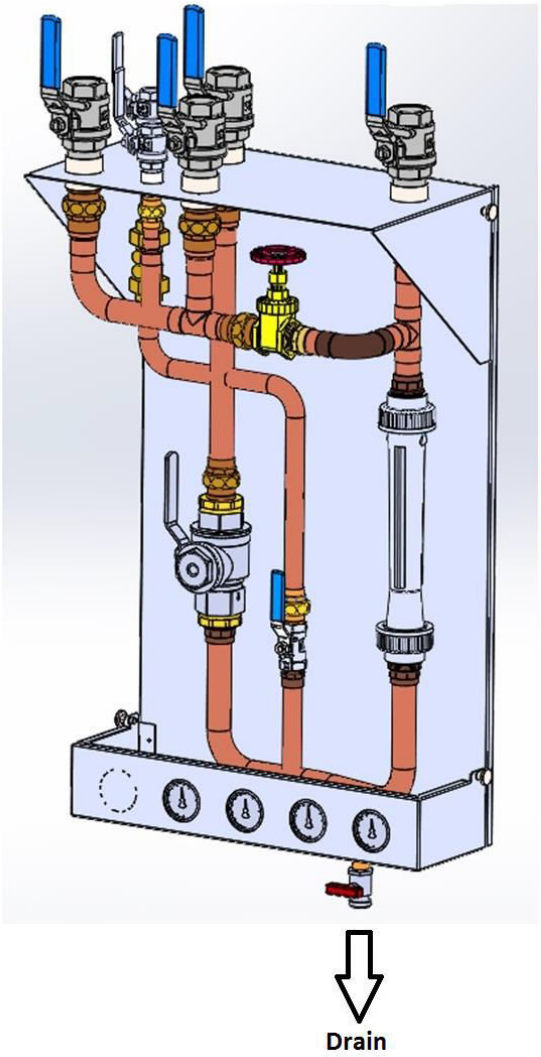
Note: Use provided spacers (3 qty.) for wall mounting.

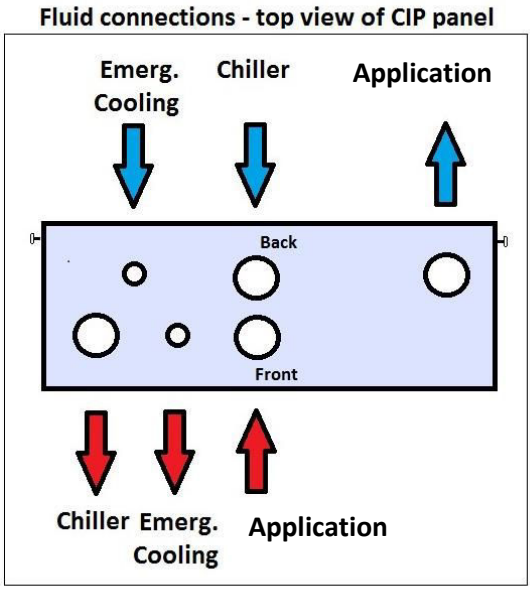



122 mm
4,8 inch
366 mm
14,41 inch
125mm
4,92 inch
795mm
31,3 inch
360 mm
14,17 inch
Location of mounting holes
Mounting Holes for M8 screws

Fluid Connections CIP

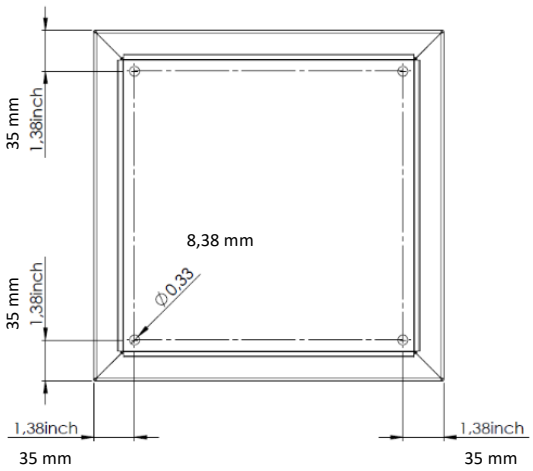
	CIP 1 (909000.0072)	CIP 2 (909000.0107)
Connection to chiller (In/Out):	1½" NPT (F)	2" NPT (F)
Connection to the HEC (In/Out):	1½" BSP (F)	2" BSP (M)
Connection to emergency cooling	¾" NPT (F)	¾" NPT (F)
Connection for Drain	½" hose connector	½" hose connector





5.2 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.

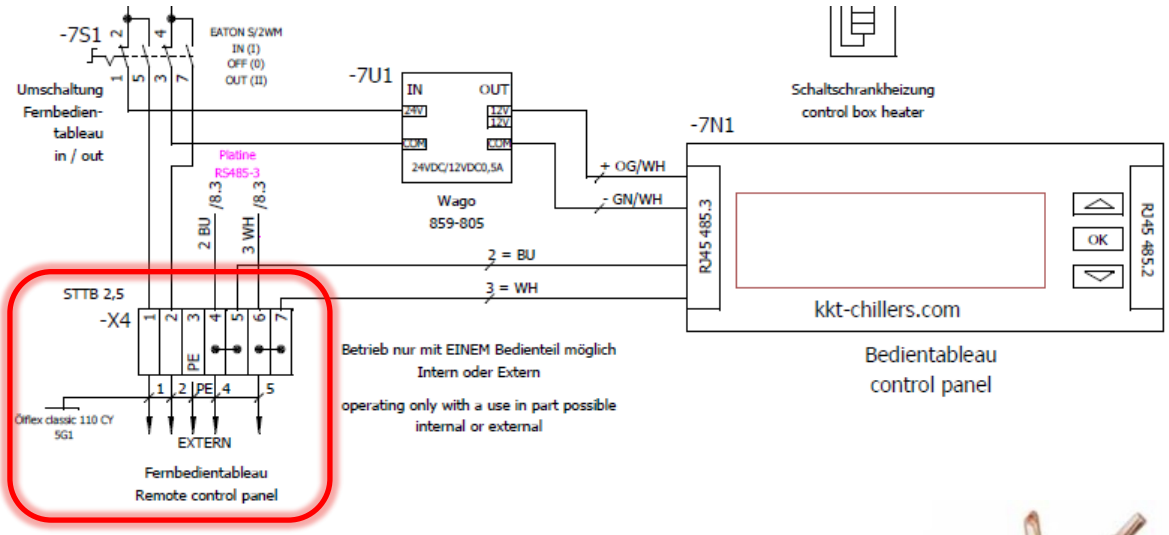
   - ⓘ Use of proper screw type designed for your specific mounting surface (wood, concrete, etc.) is required.
   - ⓘ Recommended screw size M8

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).

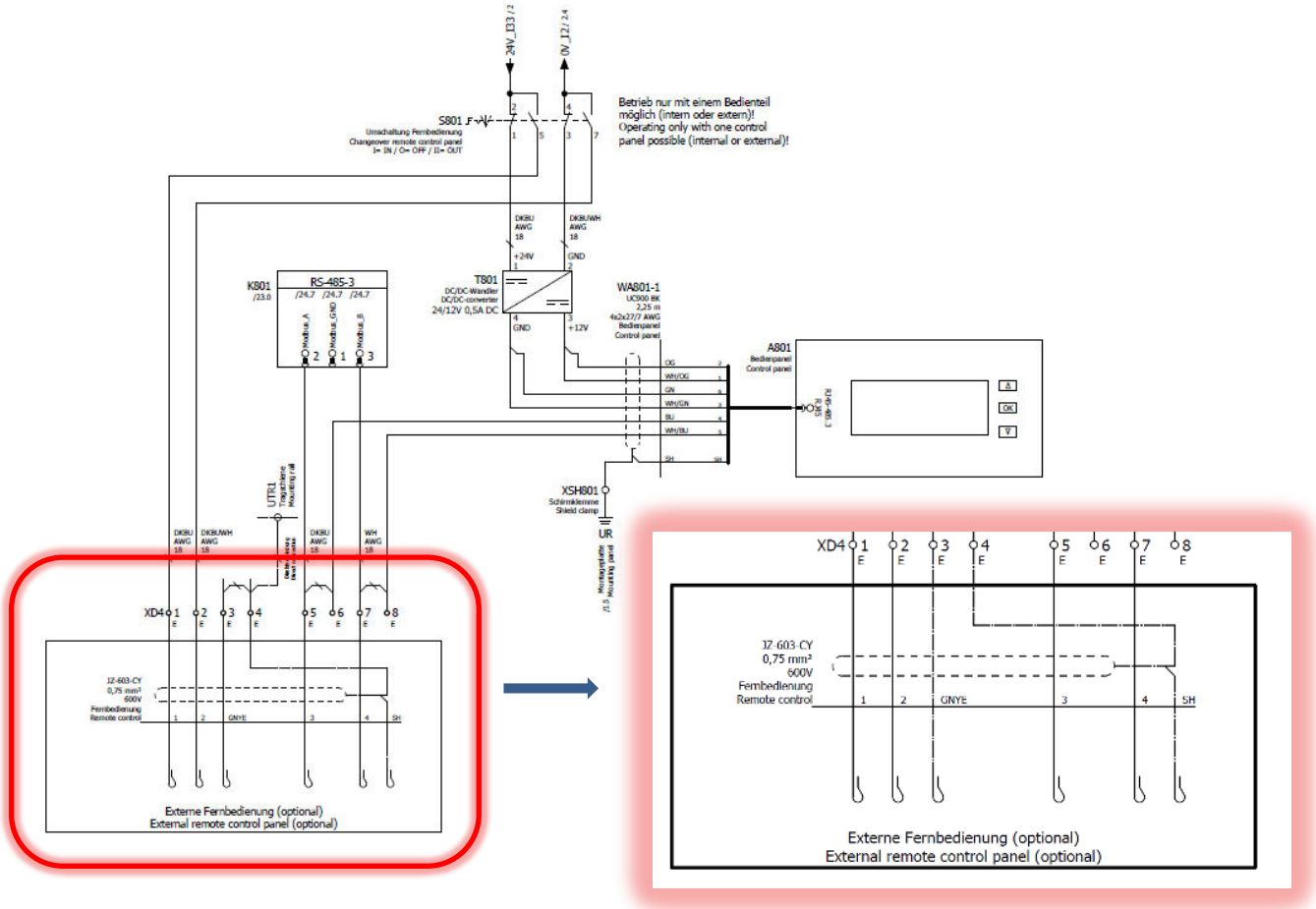
Circuit Overview

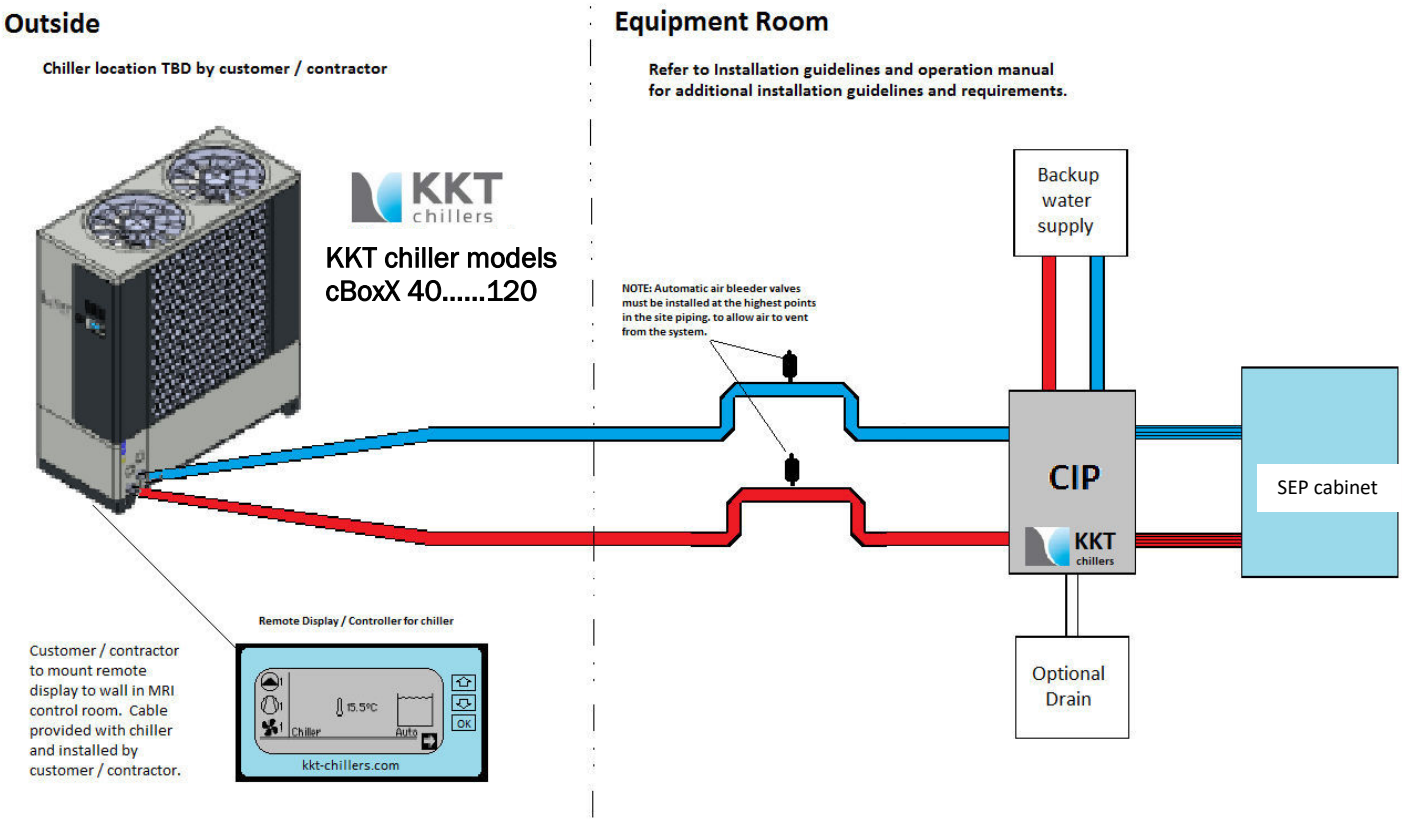
- ⓘ Data transfer cable needs to be placed in 1" conduit.
- ⓘ Please, use this conduit for transfer cable ONLY and NOT for power supply.
- ⓘ If total length exceeds 164' (50m), a long-distance remote cable (KKT# M506106) must be installed. Splicing is **NOT** allowed
- ⓘ **Important note**: Check if 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.

Option 1: Connection to X4 terminal prior to April 2019



Option 2: Connection to XD4 terminal after April 2019




Outside
Chiller location TBD by customer / contractor
KKT chiller models
cBoxX 40.....120
Equipment Room
Refer to Installation guidelines and operation manual
for additional installation guidelines and requirements.
Backup
water
supply
NOTE: Automatic air bleeder valves
must be installed at the highest points
in the site piping. to allow air to vent
from the system.
CIP
SEP cabinet
Optional
Drain
Remote Display / Controller for chiller
Customer / contractor
to mount remote
display to wall in MRI
control room. Cable
provided with chiller
and installed by
customer / contractor.
15.5°C
Chiller
Auto
OK
kkt-chillers.com

6.0 Pre-Startup Requirements:

- 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.
- 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.
- 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.
- Automatic air bleeders *must* be installed as detailed in the installation manual.
- The Mechanical Contractor responsible for the Electrical and Piping installation *must* be on site during the Startup visit.
- 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.
- All wiring must be installed, and connections made prior to our arrival. Additionally, safety disconnects must be installed and tested.
- 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.
- A water source *must* be available within close proximity (i.e.; garden hose attached to a building water supply) for maintenance purposes.
- The KKT technician will verify the chiller installation was completed per our manufacturers' guidelines, and will complete the Startup checklist while onsite.

For questions or technical support, please contact:

Service EMEA / ROW	**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
Service Americas	**KKT chillers, Inc.** 765 Dillon Drive Wood Dale IL 60191 **Service** • PH: 877.994.0991 • kktservice@kkt-chillersusa.com **Technical Support** • PH: 833.KKT.HELP (833.558.4357) • techsupport@kkt-chillersusa.com
Service Asia Pacific	**KKT chillers, Inc.** No. 108, Xinglin Street SIP Suzhou 215026 Jiangsu, P.R. China T: +86 512 6790 3091 F: +86 512 6287 1077 M: +86 400 928 9655 E: service@kkt-chillerscn.com W: www.kkt-chillers.com

7.0 Addendum:

7.1 Pre-Startup Checklist

Pre-Startup Checklist

Please Complete One Form Per Unit

Facility Name: _____

Address: _____

KKT Produce (SN): _____

KKT Model: _____

The checklist below indicates the *minimum* requirements that must be completed by the chiller installer prior to the scheduled chiller startup. The chiller must be installed considering all applicable safety practices as defined by OSHA. Each item must be verified by the project manager. Please refer to the KKT chillers Installation and Operation manual for further technical specifications.

This form must be completed and returned to KKT chillers via email support@kkt-chillersusa.com no less than 5 business days before the requested startup visit. Otherwise, an additional expedite fee will apply.

Note: *All Startup visits will be scheduled to be performed during regular office hours 8AM - 5 PM Monday through Friday.*

	Please place a checkmark in the left column once each item has been completed.
	Chiller install location provides adequate clearance for airflow and accessibility for maintenance as specified in chiller manual.
	Chiller has been mounted, anchored and supported per specifications in chiller manual.
	Chiller location is not near any other heat sources (i.e.: condenser exhaust, ventilation ducts, heating exhaust, etc.).
	Configuration of the fluid piping must adhere to the specifications included in the manual (i.e. pipe sizing and material). **Please indicate size of piping:** _____ **Number of long radius elbows (one way)** _____ **Approx. length of pipe run (one way)** _____ **ft / m** **Vertical height difference between chiller and process being cooled** _____ **ft / m**
	All piping connected to the chiller has been leak tested and flushed clean with water prior to connecting to the chiller.
	Adequate Glycol (KKT protect) and water available on site (near chiller) to insure proper glycol concentration (37% for standard installations, maximum of 50% for installations in regions with low ambient temperatures). KKT is responsible for filling the system. **Note:** Only Distilled, Reverse Osmosis or De-mineralized water should be used.
	Incoming power service connection to the chiller matches the power requirements shown on the chiller data plate.
	All field wiring connections verified and match prints. All wiring terminations have been checked for loose connections.
	Remote display panel **(if equipped)** mounted, conduit installed and provided cable run. If length exceeds 50m (164'), a long distance remote cable (100m (328')) must be purchased / installed (KKT# M506106). Splicing is not allowed.
	Power must be supplied to the chiller crankcase heaters for a minimum of 8 hours prior to arrival of service technician. **Note:** *Power must be supplied to the unit and main chiller disconnect must remain in the ON position.*
	Chiller visually checked for any signs of shipping damage (i.e.; damaged crating, bent panels, fluid leaks, etc.).
	For closed (pressurized) fluid systems only, automatic air-bleeder valves must be installed at highest point of site piping to allow air to escape from the system.

Comments: _____

By signing below, you acknowledge that you have personally verified each item on this checklist has been completed in accordance with the installation instructions and technical specifications provided in the KKT chillers Installation and Operation manual. Additionally, you acknowledge that any delays caused due to incomplete or incorrect items are your responsibility. Failure to complete any items on this checklist may result in the need for additional visits and additional charges. Any additional charges incurred as a result of incomplete items are your responsibility.

Name of Site Manager: _____ Company Name: _____

Signature of Site Manager: _____ Phone Number: _____

KKT chillers, Inc.
765 Dillon Drive Wood Dale, IL 60191
T:847 734 1600 I F: 847 734 1601 I E: sales@kkt-chillersusa.com I W: www.kkt-chillersusa.com

Revision: V7 Page 1 Effective Date: 10.21.2015
Revision Date: 05.12.2021

7.1.1 Startup Checklist

☐ Startup
☐ Preventative Maintenance
☐ Service Work Order

KKT chillers

Attention: To avoid site issues, never turn off chiller without prior permission from site personnel.

Site Information

Site name:			Date:	(MM/DD/YYYY)
Site address:				
Technician:			SO/PO#:	
Chiller location:	Roof top ☐	Same level as process ☐	Below process ☐	Other ☐ _____
Model:		Serial/produce:		
Was chiller operational upon arrival (Y / N) _____		If not, when was chiller returned to operation (Date / Time) _____		

Refrigerant type:	R407C ☐	R134A ☐	R410A ☐	Other ☐ _____

Checklist	Yes	N/A		Yes	N/A
Buffer Tank Water Pressure (ECO only) _____bar	☐	☐	Strainer in chiller and IFP cleaned	☐	☐
Fill valve adjusted to open at 0.6 bar static (ECO Only)	☐	☐	Condenser coil clean and fins straight	☐	☐
Water circuit checked for leaks	☐	☐	Correct fan rotation	☐	☐
Pump seals leak free	☐	☐	Electrical connections tight	☐	☐
Water circuit properly purged of air	☐	☐	Relays replaced	☐	☐
Obstructions above chiller	☐	☐	Communication interface checked	☐	☐
Min. 40 inch clearance around chiller	☐	☐	Chiller operation checked using Eco Data logger	☐	☐
Refrigeration system checked for leaks	☐	☐	Software version up to date _____	☐	☐

Electrical

Incoming supply voltage:	L1 _____	L2 _____	L3 _____	Crankcase heaters operational ☐ ☐
Supply amperage:	L1 _____	L2 _____	L3 _____	Remote display operational ☐ ☐

Amperage

Pump 1	L1 _____	L2 _____	L3 _____	Pump 2	L1 _____	L2 _____	L3 _____
Compressor 1	L1 _____	L2 _____	L3 _____	Compressor 2	L1 _____	L2 _____	L3 _____
Cond. fan 1	L1 _____	L2 _____	L3 _____	Cond. fan 2	L1 _____	L2 _____	L3 _____
Cond. fan 3	L1 _____	L2 _____	L3 _____	Cond. fan 4	L1 _____	L2 _____	L3 _____

Mechanical

Compressor 1 model # _____		Serial # _____		
Compressor 1 oil level	Empty ☐	1/4 ☐	1/2 ☐	3/4 ☐
Compressor 2 model # _____		Serial # _____		
Compressor 2 oil level	Empty ☐	1/4 ☐	1/2 ☐	3/4 ☐

KKT chillers, Inc.
765 Dillon Drive, Wood Dale, IL 60191
T: 847 734 1600 I F: 847 734 1601 I E: sales@kkt-chillersusa.com I W: www.kkt-chillersusa.com

Revision: V01.4

Page 1 of 2

Effective Date: 09.16.15
Revised Date: 05.30.18

☐ Startup
☐ Preventative Maintenance
☐ Service Work Order

Attention: To avoid site issues, never turn off chiller without prior permission from site personnel.

Mechanical (Continued)

Pump 1 Make / Model # _____			Serial # _____	
Type of glycol _____	Propylene ☐	Ethylene ☐	Percentage_____	Note: If under 20%, take fluid sample
Water Quality Checked? Yes ☐ No ☐	Distilled ☐	Deionized ☐	Tap Water ☐	
Pump 2 Make / Model # _____			Serial # _____	
Type of glycol _____	Propylene ☐	Ethylene ☐	Percentage_____	Note: If under 20%, take fluid sample
Water Quality Checked? Yes ☐ No ☐	Distilled ☐	Deionized ☐	Tap Water ☐	

Pressure

Pump 1	Suction_____	Discharge_____	**Static Fluid Pressure** (Note: Must be measured with chiller off):	
Pump 2	Suction_____	Discharge_____	* **ECO Chiller** (Measure at IFP)	_____
Compressor 1	Suction	Discharge	* **Other Models** (Measure at Chiller Pump)	_____
Compressor 2	Suction_____	Discharge_____	Nitrogen Pressure (Start-up, PM or Top-Off):	Expansion tank _____ Buffer tank (ECO only) _____

No.	Description	Circuit 1	Circuit 2
1	Condensing outlet temperature	°C	°C
2	Liquid temperature	°C	°C
3	Subcooling	°C	°C
4	Evaporation outlet temperature	°C	°C
5	Suction gas temperature	°C	°C
6	Superheat	°C	°C

Ambient temperature: ____ °C

Coolant temperature: ____ °C

Note: Above readings must be taken while chiller is operating against a heat load

Comments

Attention: Please check with site personnel when work is complete, and reset any equipment that may have faulted during service.

Check In Date / Time: _____ Check Out Date / Time: _____ Follow-up required? ☐ Yes ☐ No

Customer Signature: _____ Date: _____

Please return the completed form to KKT chillers: techsupport@kkt-chillersusa.com

KKT chillers, Inc.
765 Dillon Drive, Wood Dale, IL 60191
T: 847 734 1600 I F: 847 734 1601 I E: sales@kkt-chillersusa.com I W: www.kkt-chillersusa.com

This page left intentionally blank