

Product sheet

LCX Liquid-to-Liquid Coolant Distribution Units (CDU's)



LCX Highlights

- 18 Ga. Galvannealed steel exterior casing powder coated with matte grey dark finish
- 12 Ga. formed galvanized steel base with lifting pockets. Base is powder coated with matte grey dark finish
- 16 Ga. 304L stainless steel double pitched drain pan
- Powder coated steel treadplate floor installed above drain pan for slip resistant foot traffic
- Brazed plate heat exchanger constructed with 316 SS plates and copper brazing (HX # plates and spacing are optimized based on each specific project design objectives)
- Custom capabilities
- Made in USA (Ireland alternative manufacture site option)

Designed for the modern data center where liquid cooling is deployed at scale, Munters LCX (Liquid-to-Liquid) CDUs provide the interface between the Facility Fluid (FF) and the Technology Fluid (TF).

LCX is efficient, easily serviceable, and adaptable to a variety of operating conditions.

Munters LCX uses a Facility Fluid, typically chilled water, to condition a separate, isolated Technology Fluid (typically water/25% Propylene Glycol blend) to the desired temperature, flow, particulate filtration (25 micron), and external pressure for optimal liquid cooling. The Technology Fluid can integrate with direct to chip cold plates, rack mounted CDUs, immersion pod HXs, etc.

With LCX, redundancy is achieved with fully redundant units connected to a common TF circuit, offering superior system reliability and serviceability compared to single CDU's that offer only partial redundancy by use of multiple internal back-up components.

LCX

Technology Fluid (TF)

- Inlet and outlet isolation valves
- Schedule 10 minimum, 316 stainless steel Technology Fluid piping
- Drain valve
- Grooved or optional flanged pipe connections
- Flow measurement
- 316 SS construction technology water pump with variable speed TEFC motor with Aegis shaft grounding rings. Custom pump/motor options available.
- Brass construction TF pressure relief valve installed downstream of pump
- Dual TF supply temperature sensors with self-diagnostics
- Check valve on TF fluid discharge
- 316 SS TF filter housing with low pressure drop 25µ high flow 99.98% eff cartridge filter, polypropylene construction w/ EPDM O-rings
- TF sampling port
- Automatic and manual vent valves for supply and return connections – provided in 12" long piping sections that are shipped loose for installation by others at the high point in the system
- Pressure gauges on inlet and outlet of HX
- Technology Fluid process variables measured: Inlet pressure before and after pump, temperature at HX inlet, pressure downstream of HX (inlet side of filter), pressure downstream of filter, supply temperature (dual sensors), flow
- All temperature sensors are installed in stainless steel wells with thermal paste for ease of serviceability
- All TF hydronic components are 316 SS or 304 SS, except for the brass PRV, and are compatible with Dowfrost LC25 or other PG25 blends

TF Flow Calculator based on delta T

ΔT		GPMr per kW	L/min per kW
Deg (F)	Deg (C)		
15	8.3	0.4755	1.8001
16	8.9	0.4459	1.6878
17	9.4	0.4197	1.5886
18	10.0	0.3964	1.5005
19	10.6	0.3756	1.4217
20	11.1	0.3568	1.3508
21	11.7	0.3399	1.2866
22	12.2	0.3245	1.2282
23	12.8	0.3104	1.1750
24	13.3	0.2975	1.1261
25	13.9	0.2856	1.0812
26	14.4	0.2747	1.0398
27	15.0	0.2645	1.0014

Estimated values based on Dowfrost LC25 and 85F (29.4C) supply fluid
 GPMr = GPM at return fluid temperature

Example: What is the TF flow rate for a CDU rejecting 500 kW of load, 85F supply fluid, 18F dt?
 $500 \times 0.3964 = 198.2$ GPM at 103F return temperature

Table values may be applied to other entering LC25 / PG25 fluid temperatures with minor loss in accuracy due to specific heat and density variances with temperature



LCX-500 Standard

LCX

Facility Fluid (FF)

- Inlet and outlet isolation valves
- Schedule 10 minimum carbon steel FF piping
- FF strainer, 50 mesh
- Drain valve
- Pressure independent 2-way facility water flow control valve including flow correlation allowing for fluid flow measurement
- Grooved or optional flanged pipe connections
- Facility Fluid process variables measured: inlet temperature, inlet pressure before and after strainer, temperature and pressure at leaving side of brazed plate HX, flow
- Pressure gauges on inlet and outlet of HX

FF Calculator based on delta T

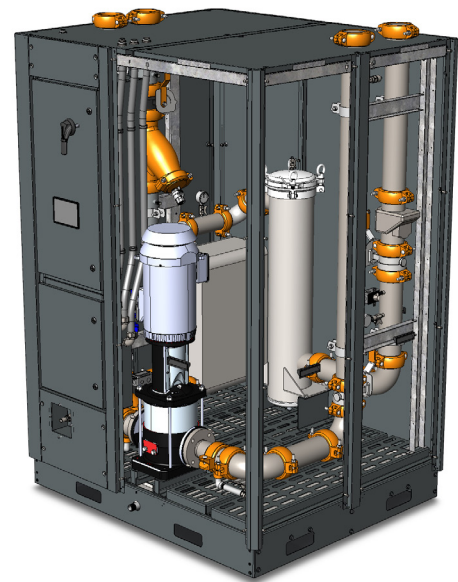
ΔT		GPMr per kW	L/min per kW
Deg (F)	Deg (C)		
12	6.7	0.5761	2.1809
13	7.2	0.5320	2.0140
14	7.8	0.4942	1.8709
15	8.3	0.4615	1.7469
16	8.9	0.4328	1.6385
17	9.4	0.4076	1.5427
18	10.0	0.3851	1.4577
19	10.6	0.3650	1.3816
20	11.1	0.3469	1.3131
21	11.7	0.3305	1.2511
22	12.2	0.3156	1.1948
23	12.8	0.3020	1.1433
24	13.3	0.2896	1.0962
25	13.9	0.2781	1.0528
26	14.4	0.2676	1.0128
27	15.0	0.2578	0.9758
28	15.6	0.2487	0.9414
29	16.1	0.2402	0.9093
30	16.7	0.2323	0.8795

Estimated values based on pure water and 68F (29.4C) supply fluid

GPMr = GPM at return fluid temperature

Example: What is the FF flow rate for a CDU rejecting 500 kW of load, 68F supply fluid, 14F dt?
 $500 \times 0.4942 = 247.1$ GPM at 82F return temperature

Table values may be applied to other entering water temperatures with minor loss in accuracy due to specific heat and density variances with temperature



LCX-500 Standard (front view)



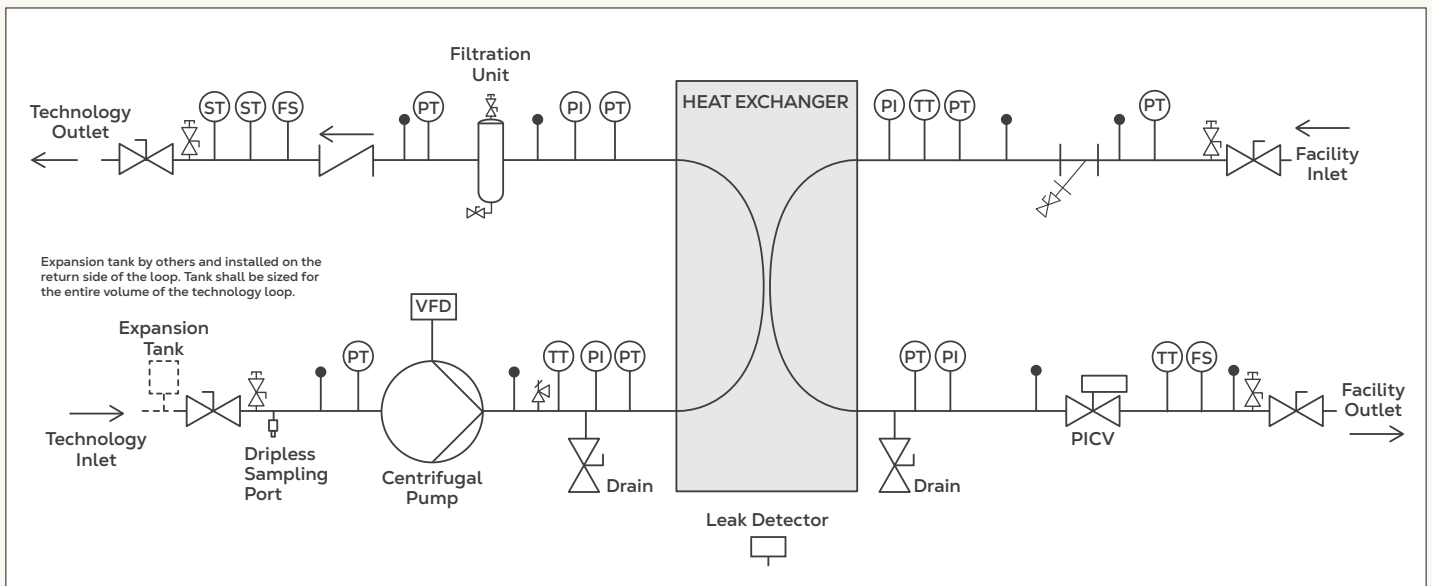
LCX-500 Standard (rear view)

LCX

Electrical & Controls

- 460/60Hz/3PH power feed (from customer supplied external UPS) to unit mounted circuit breaker disconnect
- 35 kA SCCR rating (65 kA SCCR optional upgrade)
- Power monitor
- Optional dual power feed with unit mounted ATS
- Spot Leak detector installed at the low point of the double pitched drain pan
- CDU inner cabinet temperature sensor
- VFD enclosure ventilation fan
- Programmable BACnet/Modbus compatible controller
- Heat rejection value (kW) computed from measured flow and temperature difference
- Capacitor UPS installed on power supply to controller
- Large 7" touchscreen color display/interface screen (HMI)
- ETL listed in accordance with UL 60335-2-40

Typical LCX Schematic



Legend

	Isolation Valve		Pressure Independent Control Valve		Pressure Relief Valve		Flow Sensor
	Pete's Plug		Strainer		Temperature Thermistor		Manual Vent
	Filtration Unit		Leak Detector		Drain		Dripless Sampling Port
	Pressure Transmitter		BPHX		Pressure Indicator		
	Pump		Supply Temperature Transmitter		Check Valve		

Model	LCX-500 Standard	LCX-500 Compact	LCX-800	LCX-1200	LCX-1500*
Nominal Capacity (kW)**	500	500	800 (Future)	1200	1500
Facility Fluid Pipe Diameter (IN) Carbon Steel - grooved connection	4	4	5	6	6
Technology Fluid Pipe Diameter (IN) 316 SS - grooved connection	4	3	5	6	6
Physical Data					
Width (in)	64	36	TBD	82	80
Depth (in)	56	60	TBD	60	70
Height (in)	91	91	TBD	91	91
Shipping weight (lb) w/ pallet	2630	2261	TBD	4965	5027
Service access	Front	Front & either Back or one side	Front	Front	Front
Required clearances	48" Front, 1" each side	48" Front & 48" either Back or one side, 1" minimum each side	48" Front, 1" each side	48" Front, 1" each side	48" Front, 1" each side
Facility side internal pressure drop (PSID)***	20-27 PSI	20-27 PSI	20-27 PSI	20-27 PSI	20-27 PSI
TF available external pressure drop (PSID) flowing 1.5 LPM/kW ***	50 PSI	50 PSI	45 PSI	45 PSI	45 PSI
Technology Fluid (TF) pump motor size ***	15 HP	15 HP	20 HP	25 HP	30 HP
Amps (460/60/3 PH power feed) ***	24 FLA/30 MCA/50 MOP	24 FLA/30 MCA/50 MOP	30 FLA/37 MCA/60 MOP	35 FLA/44 MCA/70 MOP	45 FLA/56 MCA/100 MOP

* Two LCX-1500 units may be stacked with an interface structural section between

** based on 1.5 LPM/kW TF flow rate, which equates to 18F (10C) TF delta T

*** varies with operating parameters. Note 4 PSI strainer loading allowed for the Facility side internal PD
Contact Munters for a detailed selection that meets your needs

Pipe Velocity Multiplication Factor (VF)

Diameter	sch 10 steel	sch 40 steel	Type L copper
3"	0.0384	0.0434	0.0471
4"	0.0225	0.0252	0.0268
5"	0.0146	0.0160	0.0172
6"	0.0101	0.0111	0.0120

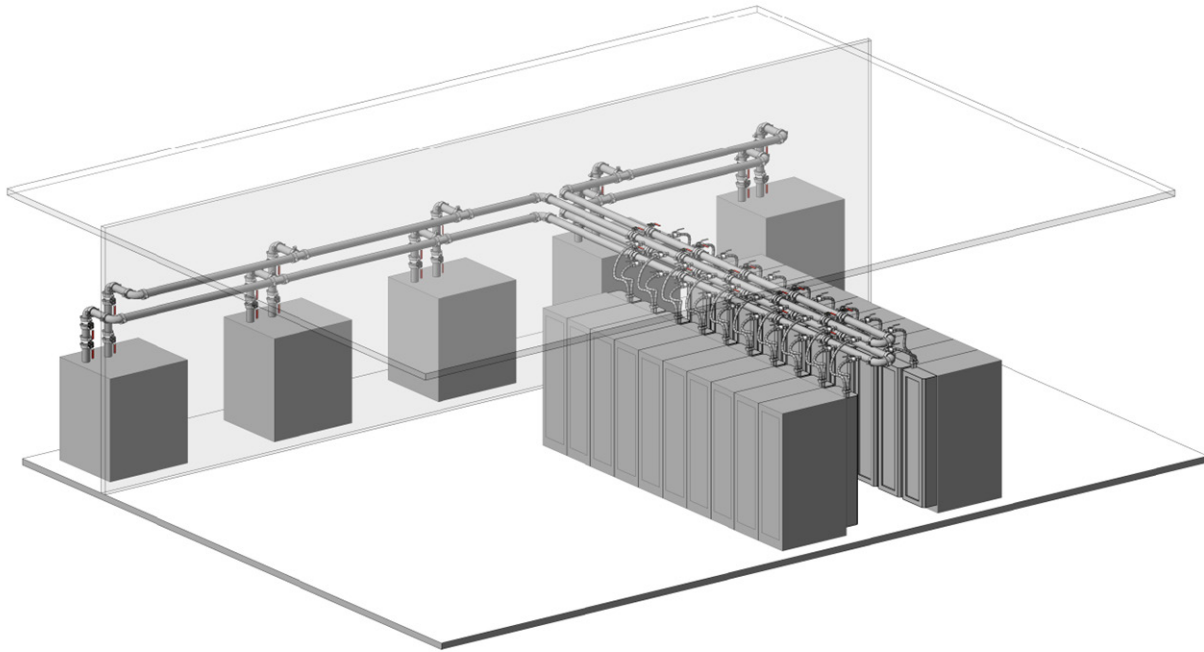
Multiply GPM x VF to obtain pipe velocity in ft/s

Example: The TF flow rate is 198.2 GPM and the TF is flowing in 4" sch 10 stainless steel pipe. What is the fluid velocity?

$198.2 \times 0.0225 = 4.46 \text{ ft/s}$
 $\text{ft/sec} \times 0.3048 = \text{m/s}$

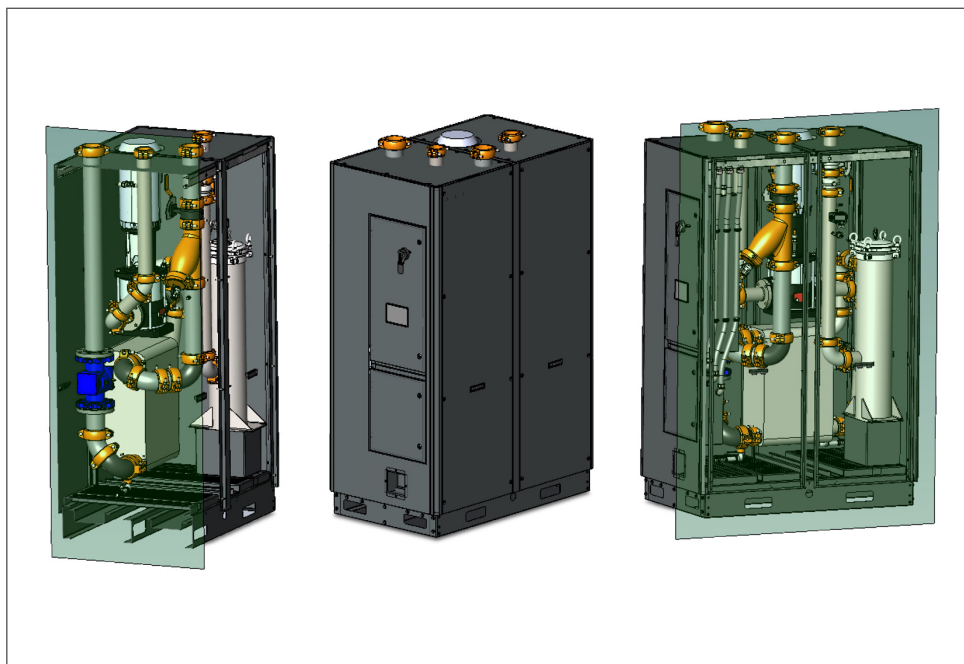
LCX

Sample LCX Installation Detail

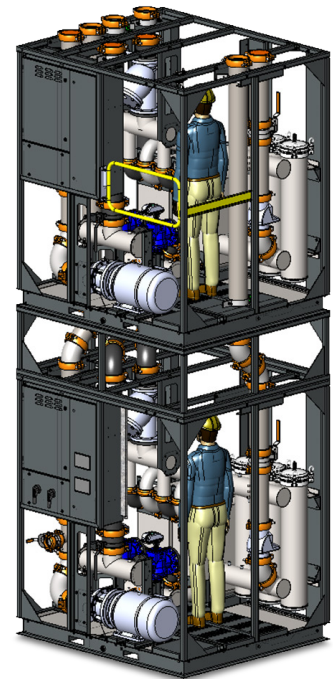


LCX Special Configurations

LCX-500 Compact



LCX-3000



Two LCX-1500 units may be stacked with an interface structural section between.

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