

**Eaton fluid conveyance**  
Solutions for liquid cooling data centers

Count on Eaton's decades  
of data center experience  
to help lead the future of  
data center liquid cooling



**EATON**

*Powering Business Worldwide*

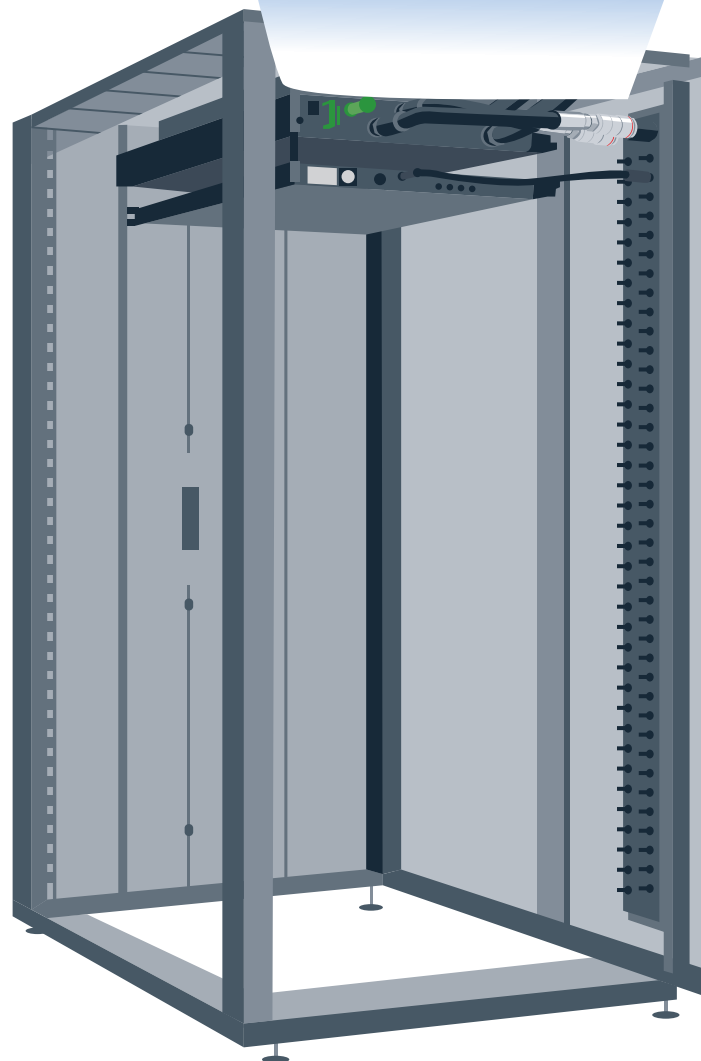
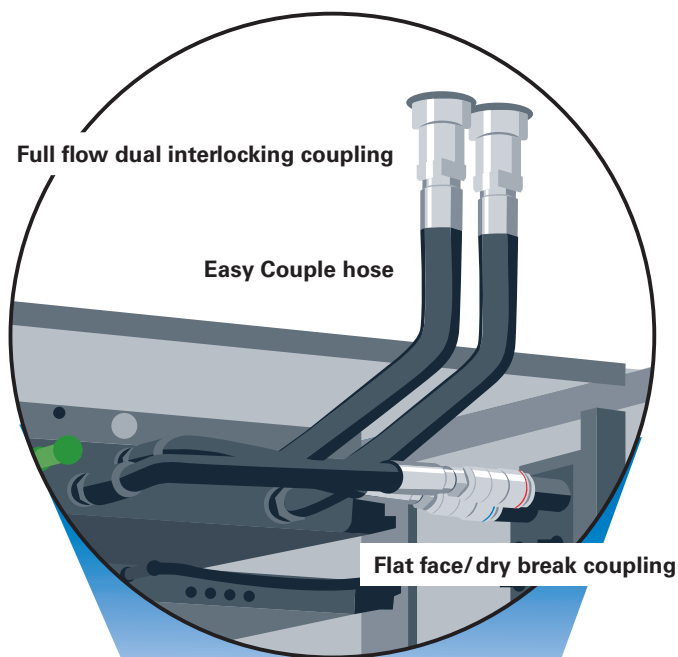


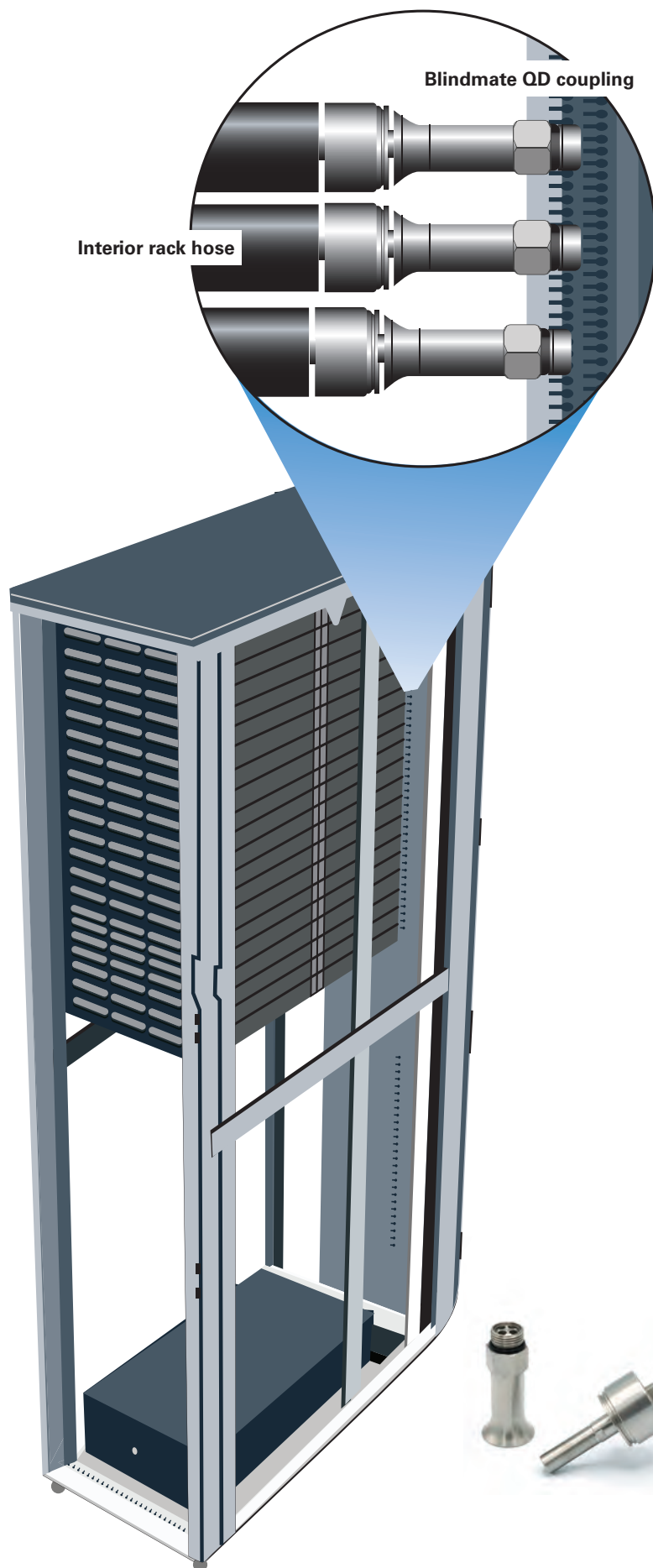
From main supply lines to single point connections, Eaton has a full portfolio to solve your liquid cooling needs.

For technology focused data centers, Eaton is offering proven and industry leading portfolio which is known for reliability and decades of proven performance.

**EAT•N**

*Powering Business Worldwide*





Rest easy knowing  
Eaton products will ensure  
the liquid cooling of your  
data center operates  
effectively and consistently.



**OPEN**  
COMMUNITY®

Eaton is an Open Community  
Project Member



# Liquid cooling Couplings

Coming in 2021

Universal Quick Disconnect



## Blindmate QD

Self-centering  
double acting coupling

Made to allow easy, trouble-free connections of server blades this is the smallest size connector in our offering. Made to a standard interchange but with the design integrity and quality that Eaton is known for.

- Very low variability in valve centering to ensure proper alignment
- Force to connect below specifications requirement
- One connector mounts to rack while other installed on blade
- Designed to work directly with hose and tubing



## FD83 series

Full flow dual  
interlocking coupling

An industry standard, our stainless steel FD83 has been supporting data center liquid cooling reliably for decades.

- Interlock design ensures parts cannot be disconnected while liquid is flowing
- Multiple end connection configurations, including angled hose barbs, available
- Ball valve for full flow and minimal pressure drop

▶ Light-weight, durable engineered composite design available 2021. Offers same operating performance and is interchangeable with current design.



## ADB series

Flat face/dry break  
couplings

Eaton's flat face aluminum (ADB) coupling is a lightweight, strong dry break coupling featuring Eaton's proprietary profile and alignment features providing easy connection.

- Ideal for smaller supply lines when superior performance is needed compared to plastic couplings
- Optional color anodized option to aid in connection matching



## MLDB series

Flat face/dry break  
coupling

Eaton's MLDB series stainless steel coupling is a flat face/dry break coupling ideal for liquid cooling applications. Designed with a focus on high flow rate and low pressure drops this coupling is perfect for smaller connection lines.

- Safety sleeve lock prevents accidental disconnections
- Push to connect with double shut-off valving

# Liquid cooling Hoses

▶ **Coming in 2021**  
UL94 V-0 hose



## **H201** Eaton easy couple hose

Hose ideal for liquid cooling supply lines when leak free connections around electronics are required. H201 provides excellent fitting retention with no crimping required when matched with qualified Eaton's barb connectors.



## **GH109** Flexible, lightweight EPDM hose

GH109 EPDM hose is designed specifically for coolant applications. The highly engineered EPDM tube compound offers excellent fluid resistance with coolants. It is also extremely flexible making assemblies and easy to install in tight routings.



## **FC332** AQP High temperature Socketless® hose

Textile braid reinforcement with higher temperature performance when compared to H201. To be used in critical thermal applications.



## **EH001** Flexible flame and abrasion resistant hose

Eaton's industrial cooling hose is designed for lower pressure systems, and is ideal for larger supply lines, in data cooling applications. Nitrile inner tube provides excellent cooling fluid compatibility and performance. Qualified hose assembly with the FD83 coupling. UL 94 V2 flame rating.



## **4245** Eclipse® Formable thermal tubing

Nylon-based tubing that is ideal for cooling applications and can be formed to match a specific routing. Eaton's thermal tubing has superior abrasion resistance, easy to cut, and has excellent flexibility when used in non-formed routings. Specific hose routings can use different colors for easy identification. UL 94 HB flame rating.

## Thermoformed solution

Eaton's thermoformed hose assembly solution provides the optimum solution for liquid cooling applications. This solution removes leak points common with other systems and provides excellent flow performance giving your data center the most compact and cleanest routing.



## Blindmate QD

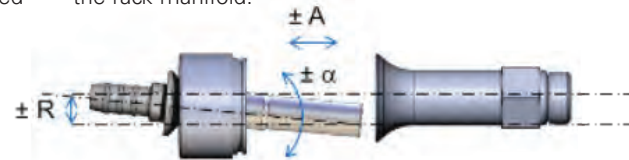
### Self-centering double-acting coupling

Liquid cooling systems on IT racks



Eaton's Blindmate QD (BQD) is a non-spill coupling used for water cooling systems on IT racks. This coupling is connected blindly when the operator inserts the blade into the rack. The locking mechanism is then deported on the rack system, the coupling does not have its own locking mechanism.

The BQD includes a very efficient feature of misalignment compensation highlighted in the picture below, to compensate radial, angular and axial misalignment between the blade and the rack manifold.



#### Physical characteristics

Body size	Max Operating Pressure	Rated Flow	Air Inclusion	Fluid Loss	Force to Connect
3mm	Under Development	Under Development	Under Development	Under Development	Under Development
5mm					

## ADB

### Flat face/dry break coupling

Liquid cooling systems



Eaton's aluminium flat face ADB coupling is a flat face / dry break coupling used for cooling systems in electric applications with circulating water and antifreeze fluids. This coupling is providing an enhanced solution for preventing spillage of cooling agent which can cause technical failures, system shutdowns, and difficult clean-ups.

- Aluminium construction extends life for safer operations and reduced maintenance.
- Enhances operations in demanding applications with heat and vibration compared to plastic couplings.
- Up to 62% higher flow than ISO 16028 requirements to improve efficiency.
- Pre-guided system that helps users pre-position the coupling making connection easy and reducing maintenance time.

#### Physical characteristics

ADB Model	ISO size	Body size	Nominal flow diameter	Max. Operating Pressure		Rated Flow	Air Inclusion	Fluid Loss	Force to Connect	
	mm	in	mm	bar	psi	lpm	ml-cc	ml-cc	N	lbf
A2DB	6.3	1/4"	5.9	25	360	25	0.002	0.001	77	17
A3DB	10	3/8"	9	25	360	80	0.012	0.03	103	23
A4DB	12.5	1/2"	11.5	25	360	110	0.012	0.025	110	25
A6DB	19	3/4"	15	25	360	150	0.03	0.05	193	43
A8DB	25	1"	18.5	25	360	290	0.15	0.13	180	40



# Liquid cooling

## Couplings

### FD83

#### Full flow dual Interlock coupling

Reliable electronics cooling



Eaton's FD83 is designed for electronics cooling applications where full flow, fluid compatibility and safety are essential. The FD83 identical halves include two interlock features to eliminate spills and ensure maximum safety. Valves cannot be opened until the coupling halves are mated and coupling halves cannot be disconnected until both halves are closed.

- Dual interlock safety feature eliminates accidental opening of coupling when disconnected with the use of a patented locking pin design and lever handle
- Design provides reliable performance and minimal spillage during maintenance or service
- Full-flow capability
- Standard seal material: EPDM
- Standard body material: 303 stainless steel

#### Physical characteristics

Coupling size	Max. operating pressure						Min. burst pressure						Rated flow		Fluid loss
	Connected		Socket/Female Half		Socket/Female Half		Connected		Socket/Female Half		Socket/Female Half				
	inch	bar	psi	bar	psi	bar	psi	bar	psi	bar	psi	bar	psi	lpm	gpm
1	10	150	10	150	10	150	20	300	20	300	20	300	189	50	5.0

### MLDB

#### Flat face/dry break coupling

For fluid transfer applications



Eaton's MLDB series stainless steel coupling is a flat face/dry break coupling used for fluid transfer applications. The MLDB series offers the ability to connect with less force, higher sealing performance and are available in multiple configurable end connections.

- Safety sleeve lock prevents accidental disconnections
- Push to connect with double shut-off valving
- Capable of working under high temperature applications
- Serviceable design allows for easy cleaning and seal replacement
- Designed with higher flow capacity and resistance to aggressive fluids and corrosion

#### Physical characteristics

Body size	Nominal flow diameter		Max. Operating pressure		Rated* flow		Air Inclusion	Fluid loss	Force to connect	
	mm		bar	psi	lpm	gpm			N	lbf
1/4	5.9		25	360	15	4	0.002	0.001	85	19
1/2	11.5		25	360	73	19	0.012	0.025	150	34
3/4	15.0		25	360	120	32	0.030	0.050	170	38
1	18.5		25	360	200	53	0.150	0.130	180	41

\* Indicated values refer to a 1 bar/14.5 psi pressure drop.

# Liquid cooling Hoses

## H201







### Easy Couple hose

Liquid cooling supply lines



Hose ideal for liquid cooling supply lines when leak free connections around electronics are required. H201 provides excellent fitting retention with no crimping required when matched with qualified Eaton's barb connectors.

Available in blue, red, green, gray, and custom colors.

#													
Part number	Hose I.D.			Hose O.D.		Maximum operating pressure		Minimum burst pressure		Minimum bend radius		Weight	
	DN	mm	in	mm	in	bar	psi	bar	psi	mm	in	kg/m	lbs/ft
H20104XX	6	6,4	0.25	12,7	0.50	21,0	300	84,0	1200	76,2	3.00	0,13	0.09
H20106XX	10	9,5	0.38	16,7	0.65	21,0	300	84,0	1200	76,2	3.00	0,19	0.13
H20108XX	13	12,7	0.50	19,1	0.75	21,0	300	84,0	1200	127,0	5.00	0,22	0.15
H20110XX	16	15,9	0.63	23,8	0.93	21,0	300	84,0	1200	152,4	6.00	0,34	0.23
H20112XX	19	19,1	0.75	26,2	1.03	21,0	300	84,0	1200	152,4	6.00	0,39	0.26
H20116XX	25	25,4	1.00	35,0	1.39	14,0	200	55,0	800	254,0	10.0	0,57	0.38

#### Construction

**Tube:** Nitrile

**Reinforcement:** Single textile braid

**Cover:** Neoprene (black hose), vinyl nitrile (colored hose)

#### Operating temperatures

-40°C to +127°C  
(-40°F to +260°F)

#### Water applications

-40°C to +100°C  
(-40°F to +212°F)

#### Selling features

- MSHA certified on all sizes and colors
- Optimal hose performance with robotics and data center cooling applications
- Excellent fitting retention
- Kink resistant and very flexible



# Liquid cooling

## Hoses







### FC332

#### AQP Socketless

High temperature cooling supply lines



Designed for liquid cooling supply lines, the FC332 provides better abrasion resistance and higher temperature rating, if the application requires a hose with higher levels of durability. Qualified with Eaton barbed connectors, for a no-crimp solution with excellent fitting retention.

#													
Part number	Hose I.D.			Hose O.D.		Maximum operating pressure		Minimum burst pressure		Minimum bend radius		Weight	
	DN	mm	in	mm	in	bar	psi	bar	psi	mm	in	kg/m	lbs/ft
FC332-04	6	6,4	0.25	12,4	0.49	20,0	300	82,0	1200	76,2	3.00	0,12	0.08
FC332-06	10	9,7	0.38	16,0	0.63	20,0	300	82,0	1200	76,2	3.00	0,18	0.12
FC332-08	13	12,7	0.50	19,1	0.75	20,0	300	82,0	1200	127,0	5.00	0,22	0.15
FC332-10	16	16,0	0.63	23,1	0.91	20,0	300	82,0	1200	152,4	6.00	0,30	0.20
FC332-12	19	19,1	0.75	26,4	1.04	20,0	300	82,0	1200	177,8	7.00	0,42	0.28

#### Construction

**Tube:** AQP elastomer

**Reinforcement:** Textile braid

**Cover:** AQP elastomer

#### Operating parameters

-40°C to +150°C  
(-40°F to +302°F) or

Water not to exceed  
+82°C (+180°F)

Air not to exceed  
+121°C (+250°F)

# Liquid cooling






## Hoses

### EH001

#### Industrial cooling hose

Flexible, flame and abrasion resistant  
UL 94 V2 flame rating



#											
Part number	Hose I.D.			Hose O.D.		Maximum operating pressure		Minimum burst pressure		Weight	
	DN	mm	in	mm	in	bar	psi	bar	psi	kg/m	lbs/ft
EH00116	25	25,4	1.00	39,1	1.54	10	150	31	450	0,68	0.46

#### Construction

**Tube:** Nitrile

**Reinforcement:** 1 textile braid

**Cover:** Neoprene

#### Operating temperatures







-40°C to +150°C  
(-40°F to +302°F)

### GH109

#### Flexible EPDM hose



GH109 EPDM hose is designed specifically for coolant applications. The highly engineered EPDM tube compound offers excellent fluid resistance with coolants. It is also extremely flexible making assemblies and easy to install in tight routings.

#												
Part number	Hose I.D.		Hose O.D.		Maximum operating pressure		Minimum burst pressure		Minimum bend radius		Weight	
	mm	in	mm	in	bar	psi	bar	psi	mm	in	kg/m	lbs/ft
GH109-9mm	9,0	.35	19,5	.77	3,2	46	16	232	75,0	3.00	0,27	.18
GH109-11mm	11,0	.43	21,6	.85	4,8	70	24	348	75,0	3.00	0,30	.20

#### Construction

**Tube:** Highly engineered EPDM

**Reinforcement:** Textile braid

**Cover:** EPDM

#### Operating temperatures

-40°C to +110°C  
(-40°F to +230°F)

# Liquid cooling

# Hoses

## Eclipse® 4245






Thermal tubing

UL 94 HB flame rating



Nylon-based tubing that is ideal for cooling applications and can be formed to match a specific routing. Eaton's thermal tubing has superior abrasion resistance, easy to cut, and has excellent flexibility when used in non-formed routings. Specific hose routings can use different colors for easy identification.



#													
Part number	Tube size	Tube O.D.		Tube I.D.		Wall thickness		Minimum burst pressure		Minimum bend radius		Weight	
		mm	in	mm	in	mm	in	bar	psi	mm	in	kg/100m	lbs/100ft
4245-02	-02	3,2	.125	2,0	0.08	0,6	0.02	69,0	1,000	6,4	0.25	0,5	0.33
4245-03	-03	4,8	.188	3,0	0.12	0,9	0.04	83,0	1,200	19,1	0.75	1,1	0.71
4245-05	-05	8,0	.312	5,9	0.23	1,0	0.04	69,0	1,000	28,6	1.13	2,3	1.54

### Construction

Tube: Nylon 12

### Operating temperatures

-54°C to +93°C  
(-65°F to +200°F)

## Thermoformed solution

Eaton's thermoformed hose assembly solution provides the optimum solution for liquid cooling applications. This solution removes leak points common with other systems and provides excellent flow performance giving your data center the most compact and cleanest routing.





From main supply lines to single point connections,  
Eaton provides the hardware to make your software work.

## Solutions to your liquid cooling challenges.



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