

# Connecting fast and easy multiple lines



**EATON**

*Powering Business Worldwide*



# Introducing our redesigned Flat Face couplings

Today, we expect our hydraulic systems to do more than ever: move faster, steer more precisely and lift heavier loads. With growing demand for more powerful and compact machines, system pressure is rising while engine compartments shrink.

To help manufacturers answer the call for high pressure and high impulse pressure solutions, we've redesigned our Flat Face (FF) Series Quick Disconnect Couplings to offer even more.

Suitable for mobile applications in a myriad of industries—including agriculture, construction and commercial vehicles—our FF couplings enable outstanding connections for top-performing hydraulic lines. They aren't just safe and leak-free, they also maximize machine efficiency, performance and uptime.

Supporting pressure and flow rates well beyond ISO 16028 standards, our newly redesigned FF couplings enable powerful machines with lower energy loss and optimized fuel consumption. Meanwhile, improved corrosion protection and simplified connectivity also mean users benefit from greater machine productivity and reliability in even the toughest environments.

Our new Multiplate system further extends all these benefits. Supporting up to six FF couplings simultaneously, our innovative solution makes hose connectivity faster and easier, while offering machine designers greater freedom and a broad range of customization options to meet any application needs.

## The FF Series at a glance:

- Exceeds ISO 16028 standards:
  - 60% higher working pressures up to 400 bar
  - Up to 74% higher flow rates, reducing energy loss
- Exceptional corrosion resistance
- Enables design versatility
- Can connect under residual pressure
- New Multiplate system supports two to six couplings

# Connect to the benefits of FF Series couplings

Our newly redesigned FF couplings offer many competitive advantages, including:



## Higher working pressures bar:

**Exceeds ISO 16028 standards with a 60% higher operating pressure up to 400 bar**

High pressure couplings typically suffer when it comes to flow rates—but ours have a top-performing pressure rating of up to 400 bar for static, steady, or non-pulsed applications and 350 bar for dynamic applications with moderate hydraulic shocks. Combining a high working pressure with a high safety factor, this is a unique solution in today's market.

## Higher flow rates:

**Up to a 74% greater flow rate than ISO 16028 standards**

Thanks to stronger materials and an optimized flow path, our new FF couplings offer top-performing flow rates, up to 74% higher than previous versions. As a result, our redesigned couplings can significantly reduce machine fuel and energy consumption. Higher flow rates also enable greater design flexibility, since smaller hose sizes can be used.

## Next-level corrosion resistance:

**Up to 1000 hours protection with our environmentally-friendly Guardian Seal coating**

With up to 3x better protection compared to previous generations of zinc plating, our new coating is proven to protect against red corrosion up to 1000 hours. It's also safer and better for the environment thanks to being nickel and solvent-free, as well as meeting global RoHS, ELV and REACH requirements.

## Connect under pressure up to 350 bars

**Connect under pressure up to 350 bar without leaks or taking in contaminants**

Our alternative FF connect-under-pressure plug design works up to 350 bar, avoiding the need to depressurize the system with specialized tools—since our patented relief valve releases residual pressure. If you have low residual pressure applications, you can also connect-under-pressure up to 50 bar with standard FF couplings.

# The Eaton design difference

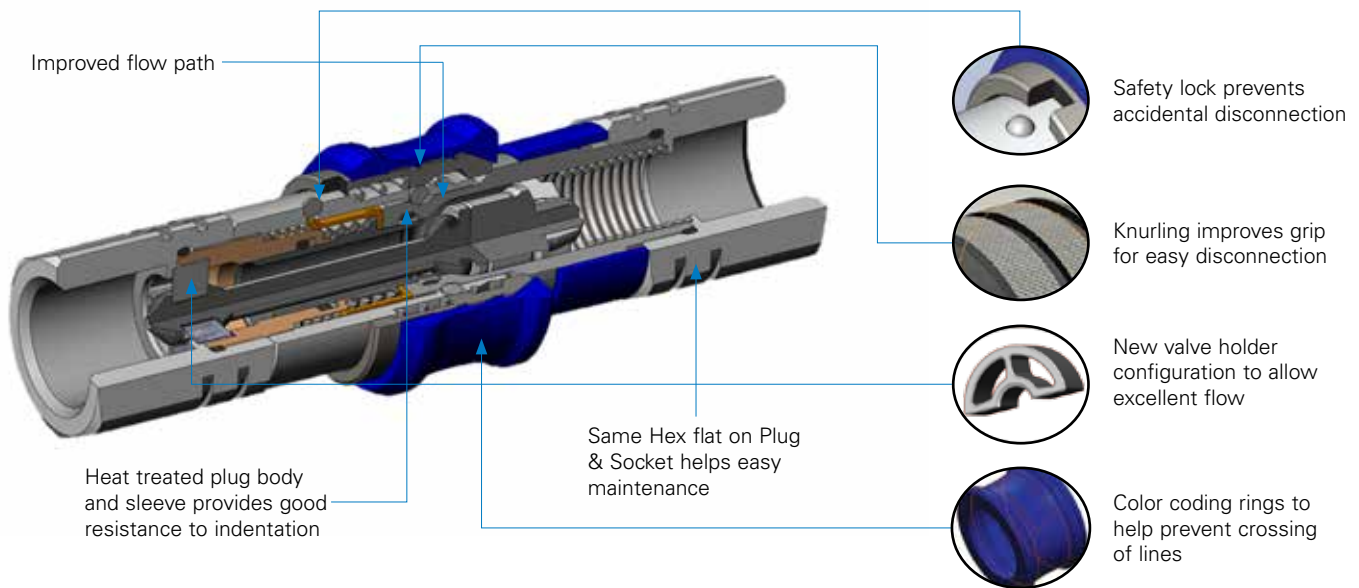
As an innovator in fluid conveyance, our FF Series couplings offer superior design, enabling enhanced performance and leak-free operations in a wide variety of applications.

Our comprehensive range of solutions enables limitless possibilities—offering body sizes from 1/4 inch to 2 inches, varied materials, seals, end connections and connect-under-pressure options. All this means we can tailor the ideal solution for your requirements.

All our FF couplings also offer a three-year warranty.

## FF Series design benefits:

- Valve holder configuration allows excellent flow rates, further supported by an improved flow path.
- Designed to meet tough application demands for strength, pressure resistance and reliability, our couplings are heat treated to ensure good resistance to indentation.
- Our FF couplings are designed with a simple and highly effective color coding system to avoid line crossing. Optional color rings are very robust and easy to install with dedicated insert tools.
- For fast and easy identification, our FF couplings are marked with a part number, date code and the Eaton logo. Additional labels can be added to your requirements via laser marking.



FF Family Part Number	ISO Size (mm)	Body Size (in)	Nominal Flow Diameter (mm)	Max operating pressure (Connected)		Rated Flow for 1 bar pressure drop (lpm)
				Static *	Dynamic **	
6FF	6.3	1/4"	7.5	400	350	18
10FF	10	3/8"	10.4	400	350	40
12FF	12.5	1/2"	12.3	400	350	77
16FF	16	5/8"	12.6	400	350	82
19FF	19	3/4"	15.1	400	350	114
25FF	25	1"	19.4	400	350	184
32FF	-	1 1/4"	22.1	300	300	260
40FF	-	1 1/2"	30.1	300	300	450
50FF	-	2"	39.2	300	300	700

\*steady or non-pulsed applications

\*\*ISO pressure rating / Dynamic application with moderate hydraulic shocks

# Our innovative Multiplate system

Our new Multiplate system (Multi-FF) further extends all the benefits of our FF couplings. Designed for any application requiring multiple hydraulic fluid connections for power transmission, our innovative system supports two to six FF couplings simultaneously. When configured to connect-under-pressure, Multi-FF also supports easy manual connection up to 350 bar.

Multi-FF makes hose connectivity both faster and simpler, as well as offering a modular and flexible design that can be customized to meet your specific requirements. This includes an option to connect electrical connections, alternative materials, a one-side handle, specialized couplings for water or air transfer, and the ability to integrate our Snap-To-Connect system.



## Smaller and lighter

Compact and light our Multi-FF solution gives manufacturers greater design flexibility and enables the creation of even more compact, energy-efficient machines. It's also easier to move attachments and create connections during assembly, installation and maintenance.

## Simplified maintenance

Replacing a failed coupling can be time-consuming and expensive in some multiplate systems. Instead, we've made it very easy to replace a coupling in the field with standard tools, minimizing downtime. Our Multi-FF solution can also integrate our Snap-To-Connect system for couplings and hose fittings, which enables faster assembly, as well as reducing the risk of failures due to the wrong torque being used.

## Exceptional ease-of-use

The system features an ergonomic handle for operator comfort, which only requires a short 130° rotation to make a connection and has distinctive start and end positions. A push button can also easily open the plates to end the connection. Additionally, the system requires a considerably lower force-to-connect—just 50N in a 4x10FF configuration.

## Cleanliness

Our Multi-FF system also greatly reduces the chance of contamination of the couplings when used in dirty environments, which can compromise the entire hydraulic circuit. An integrated sealing band between the plates prevents any contact of the couplings with dirt during operation. In addition, the fix plate features a dust cap that automatically closes to protect female couplings during disconnection.

## Robust and reliable

Alongside the excellent corrosion protection offered by our Guardian Seal plating, our Multi-FF patented internal mechanism is designed to withstand heavy duty cycles in the most demanding applications. This ensures the greatest possible uptime and also reduces maintenance costs.

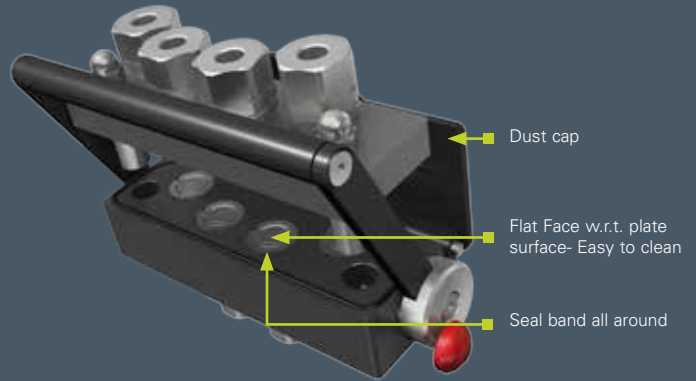
## Modular and flexible

We've designed our Multi-FF system to be hugely customizable to your specific needs. There are options to include electrical connectors, as well as specialized couplings for water or air transfer. In addition, the integrated FF couplings are available in both carbon steel and stainless steel.

# Multiplate standard configurations

## Key features:

- Robust internal mechanism and linear connection for a long service lifetime
- Easy for untrained operators to use with optimum force-to-connect
- Integrated contamination protection through sealing band and dust caps
- Improved serviceability through easy to replace couplings, dust cap and safety pin mechanism
- Modular design that allows for customized solutions with electrical connectors or specialized couplings



## Technical information:

- Supports FF coupling sizes 6, 10, 12 and 19
- Performance exceeds ISO 16028 standard:
  - Qualified for 350 bar operating pressure
  - Integrated couplings exhibit up to 74% higher flow rates
- Connect under residual pressure up to 350 bar with CUP option
- Plates constructed in aluminum
- Couplings available in zinc plated carbon steel and 316L stainless steel
- Flat Face couplings has up to 1000 hours corrosion resistance with Guardian Seal coating

	Multi-FF Part number	No. of coupling ports	Coupling type	Coupling body size	Pattern	Operating pressure	Seal	No. of Electrical port	No. of contacts in electrical connector	End connection for couplings ##
	4MFC-10CUP15LS11	4	FFCUP**	ISO 10	DLM122	250 bar	NBR	0	–	15L as per ISO 8434-1
	4MFCE1-12CUP15L	4	FFCUP	ISO 12	Generic	350 bar	NBR	1	3#	15L as per ISO 8434-1
	4MFC-12CUP15L	4	FFCUP	ISO 12	Generic	250 bar	NBR	0	–	15L as per ISO 8434-1
	4MFC-1015L	4	FF*	ISO 10	Generic	350 bar	NBR	0	–	15L as per ISO 8434-1
	4MFCE1-1015L	4	FF	ISO 10	Generic	350 bar	NBR	1	3	15L as per ISO 8434-1
	6MFC-1015L	6	FF	ISO 10	Generic	350 bar	NBR	0	–	15L as per ISO 8434-1

\* FF is ISO 16028 interchange flat face series coupling

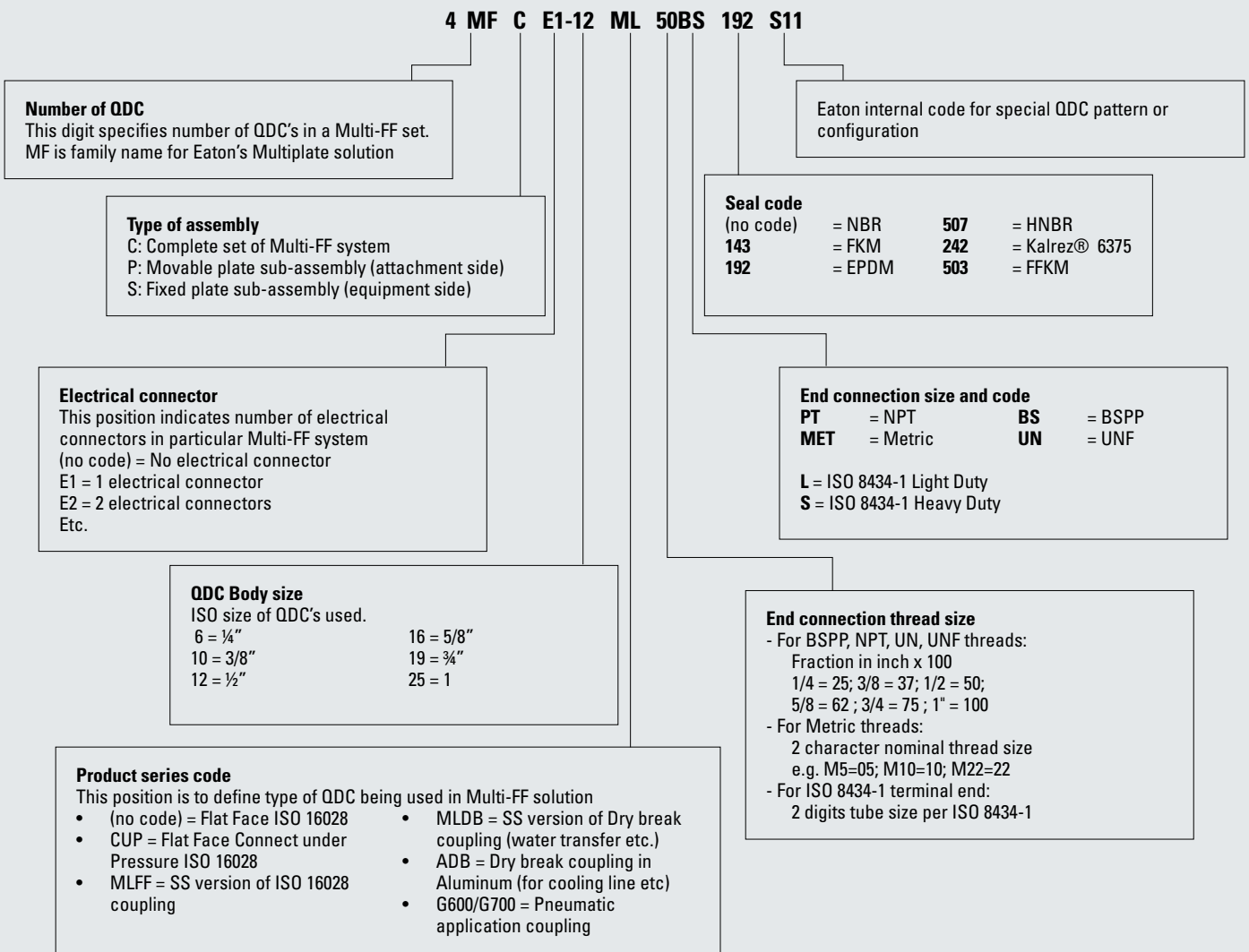
\*\* FFCUP is ISO 16028 interchange flat face series coupling with connect under residual pressure capability on plug side

# No. of contacts in each connector is configurable and connector can be provided with 3 to 12 number of contacts as per requirement

## Other end connection styles and sizes are available. See next page for list of end connection available for configuration. Contact Eaton CSR for more information.

**Note:** This limited list of configurations are indicative only. Eaton's Multi-FF solution is highly configurable and optimum solution can be provided to meet application requirements. Please contact Eaton CSR for more information.

# Multiplate configurable design



## MLDB Series (Stainless Steel) Flat Face/Dry Break

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.



## ADB Series (Aluminium) Flat Face/Dry Break

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.



## G600 Series ISO 6150 B Interchange

Eaton Gromelle™ G600 Series is a single shutoff compressed air coupling that interchanges with ISO 6150 B and US A-A-59439 Standards requirements. Nominal diameter is 5.5 mm. Its new revamped design and the materials used make it a rugged and long-lasting coupling, offered in a wide selection of end connections. It is used in general pneumatic applications.



## MLFF Series (Stainless Steel) ISO 16028 Flat Face/Dry Break

Eaton's MLFF Series stainless steel coupling is a flat face dry break coupling used for hydraulic applications. The MLFF Series interchanges with all ISO 16028 profiles. Due to its stainless steel design, it is corrosion resistant and can handle aggressive environments.



**Eaton  
Hydraulics Group USA**  
14615 Lone Oak Road  
Eden Prairie, MN 55344  
USA  
Tel: +1 952 937 9800  
Fax: +1 952 294 7722  
[www.eaton.com/hydraulics](http://www.eaton.com/hydraulics)

**Eaton  
Hydraulics Group Europe**  
Route de la Longeraie 7  
1110 Morges  
Switzerland  
Tel: +41 (0) 21 811 4600  
Fax: +41 (0) 21 811 4601

**Eaton  
Hydraulics Group Asia Pacific**  
Eaton Building  
4th Floor, No. 3 Lane 280  
Linhong Rd  
Changning District  
Shanghai 200335  
China  
Tel: (+86 21) 5200 0099  
Fax: (+86 21) 5200 0400