

MULTICONNECTORS



Improved Connection
Efficiency

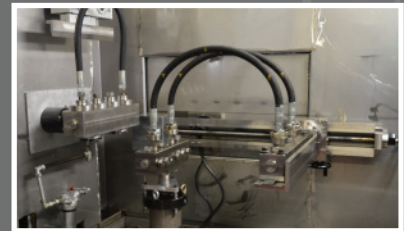
“Manuli Hydraulics is focused on achieving excellence in the design, manufacture, and supply of fluid conveyance solutions, components and associated equipment for high pressure hydraulics, industrial material conveyance, refrigeration and cooling applications.”



Our experienced Research & Development team take 2D drawings to 3D models to real life products.



Our world-class hoses, fittings and assembly equipment are manufactured in-house to the highest standards.



We test and validate our products to meet and exceed technical industry standards.

DESIGN

MANUFACTURE

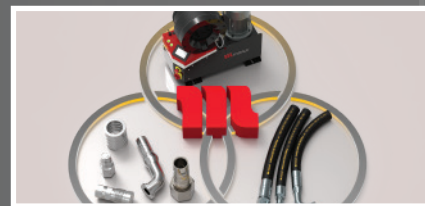
TEST

SUPPLY

INTEGRATED SYSTEMS



We provide the complete solution: hoses, fittings, crimping parameters and assembly equipment for a fully integrated system.



We supply fluid conveyance solutions directly to our customers whenever and wherever they are.

From design to manufacture, and assembly, Manuli Hydraulics' continual commitment to this unified philosophy makes us a global leader in providing integrated solutions for fluid and material transfer connector applications including hydraulics, refrigeration & air conditioning, oil & gas, water and industrial low-pressure.

Manuli Hydraulics offer a complete range of hoses, fittings and assembly equipment which are purposely designed to work seamlessly together. This harmonized approach allows us to guarantee the quality and performance of our hose assemblies.

Every metre of hose and every single fitting is backed by industry knowledge and experience, made available to you through our dedicated team of application engineers.

From advice on component selection and configuration, our technical expertise allows us to support and work directly with our customers whenever and wherever they are based.

Disclaimer: We reserve the right to modify our products and/or related services and/or discontinue the manufacture and/or supply of any of the products and/or related services, without notice. No product is warranted as being fit for a particular purpose and we do not assume any liability in connection with the use of our products other than those technically approved in writing by us, or specified in the relevant official technical specifications released by us, for specific products. This document supersedes all previous versions and previously issued documentation. The only official source of technical crimping parameters regarding our products is our Digital Crimp Tools. Printed copies are uncontrolled therefore, please be sure to use the latest versions of our Manuli [Crimp App](#) or visit our [Crimp Web Tool](#). For more information, please visit our dedicated '[Contact](#)' page on the Manuli's website.

SUPERIOR COUPLING PERFORMANCE

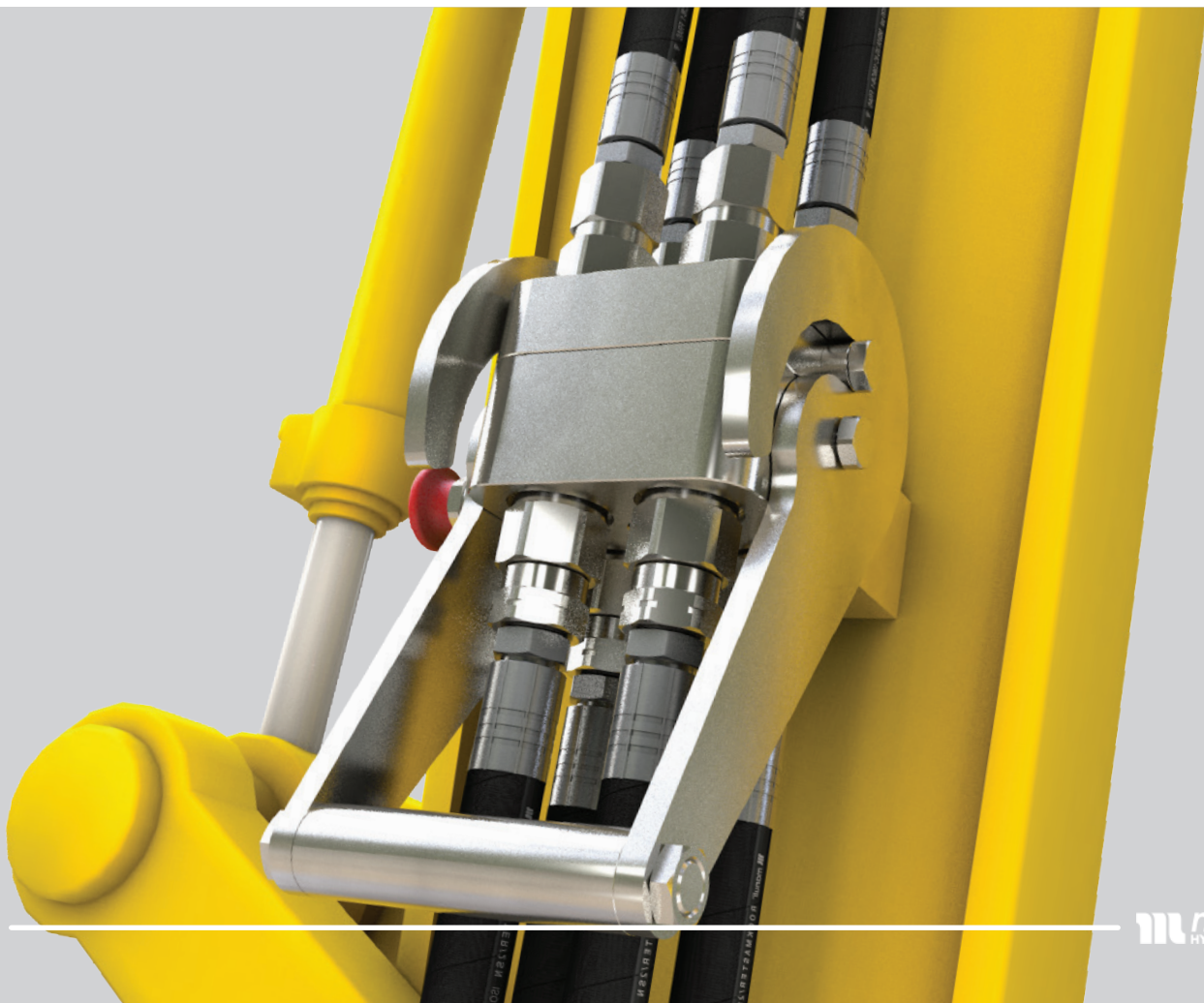
The Q.Safe Quick Coupling range from Manuli Hydraulics is widely renowned for representing the Gold Standard in quick coupling quality and performance. The introduction of the Q.Safe Flat Face Multiconnector range combines this superior performance with the added efficiency and safety related benefits of a multiconnector block system.

SOLUTIONS DESIGNED FOR EVERY SITUATION

Manuli Hydraulics recognises that every application has different requirements, which is why an extensive range of multiconnector configurations has been developed. Whether you require a 2, 4, 6 or 8 line multiconnector, there is a model suited to your application.

Q.SAFE MULTICONNECTOR BENEFITS

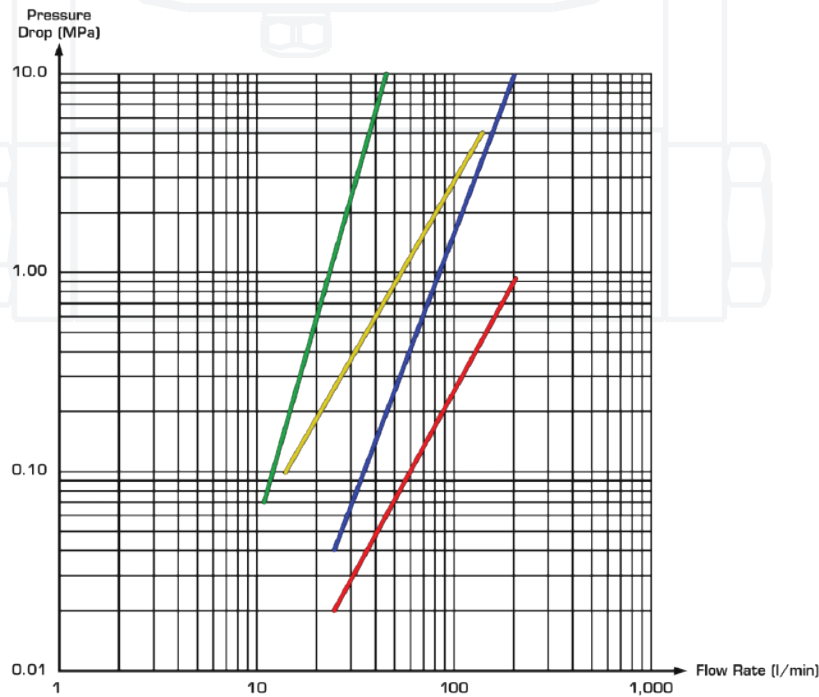
- **Reduced Connection Time:** Faster connection when multiple connectors are used.
- **Error Free Connection:** Eliminates risk of incorrect connection.
- **No Misalignment:** Ensures correct alignment between mobile and static blocks.
- **Compact Design:** Minimises added weight and space.
- **High Pressure Performance:** Supports high pressure and high flow rates.
- **Easy Cleaning:** Simple to clean and maintain.
- **Reduced Pressure Drop:** Maintains efficient flow performance.
- **Minimal Oil Spillage:** Limits oil loss during connection and disconnection.
- **Residual Pressure Connection:** Allows connection under residual pressure.
- **Flexible Hose Arrangement:** Enables closer hose positioning with easy access.



THE MANULI ADVANTAGE

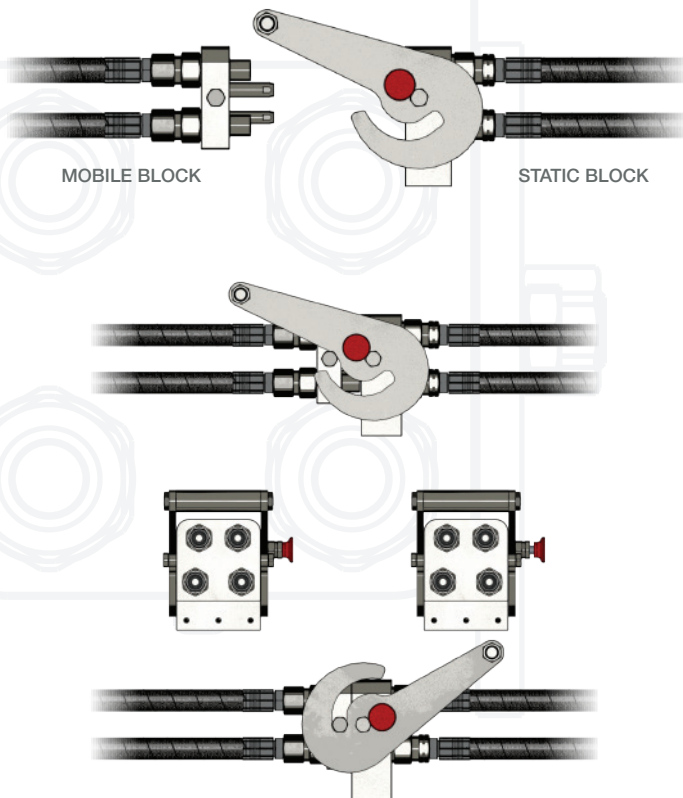
Precision engineered and manufactured to high standards, the Q.Safe range of flat face quick couplings is recognised for its advanced inner profile, which reduces pressure drop across the coupling. The Q.Safe Flat Face Multiconnector series applies this same design, supporting high energy efficiency in multiconnector applications.

PRESSURE DROP VS. FLOW RATE



- Competitor 1 Equivalent Quick Coupling (DN12)
- Competitor 2 Equivalent Quick Coupling (DN12)
- Competitor 3 Equivalent Quick Coupling (DN12)
- Manuli Hydraulics Quick Coupling (DN12)

SIMPLE THREE STEP CONNECTION









The Q.Safe Multiconnector features a simple and robust design, making it easy to connect up to eight individual couplings.

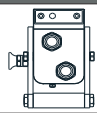
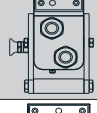
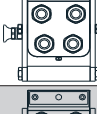
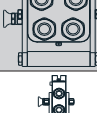

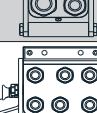
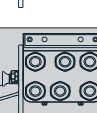
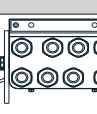
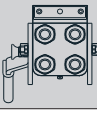
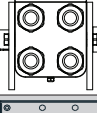

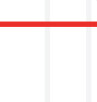
Position the mobile block so the couplings align with the static block. The extended pins guide alignment by fitting into the mating holes.

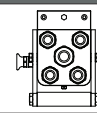
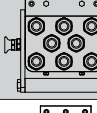
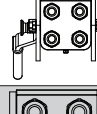
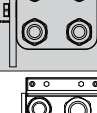
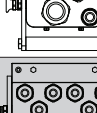
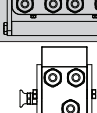
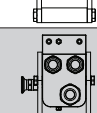
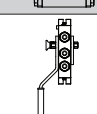
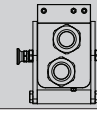
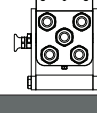

Pull out the red locking pin to release the handle, then move the handle as indicated to draw the mobile block towards the static block and complete the connection. The red pin will return into place once connected, securing the assembly.

TECHNICAL DATA

																		
SIZE			WORKING PRESSURE - CONNECTED (Dynamic)		WORKING PRESSURE - DISCONNECTED (Dynamic)		RATED FLOW at 0.2 FIXED PART of pressure drop		OIL SPILLAGE Connection/ Disconnection		MINIMUM BUSRT PRESSURE						CONNECTION/ DISCONNECTION UNDER PRESSURE	
DN	inch	Dash	FIXED PART	MOBILE PART	FIXED PART	MOBILE PART	l/min	US GPM	cc.	cubic inch	MALE		FEMALE		M & F			
											FIXED PART	MOBILE PART	FIXED PART	MOBILE PART	FIXED PART	MOBILE PART		
10	3/8"	06	35	5,075	35	5075	44	11.6	0.007	0.0004	170	24,650	140	20,300	180	26,100	Allowed	
12.5	1/2"	08	35	5,075	35	5075	76	20.1	0.008	0.0005	170	24,650	140	20,300	180	26,100	Allowed	
19	3/4"	12	35	5,075	35	5075	129	34.1	0.009	0.0005	140	20,300	140	20,300	160	23,200	Allowed	
25	1"	16	35	5,075	35	5075	172	45.4	0.02	0.0012	160	23,200	150	21,750	160	23,200	Allowed	

The rated flow represents the normal operating condition. The maximum recommended flow rate is equal to 1.5 times the rated flow

MULTI-COUPLING SERIES	CONFIGURATION	NO. OF LINES	SIZE		
			FIXED PART	inch	Dash
Q401		2	10	3/8"	-06
Q402		2	12.5	1/2"	-08
Q403		4	10	3/8"	-06
Q404		4	12.5	1/2"	-08
Q405		2	10	3/8"	-06
Q406		2	12.5	1/2"	-08
		2	19	3/4"	-12
Q407		6	10	3/8"	-06
Q408		6	12.5	1/2"	-08
Q409		8	12.5	1/2"	-08
Q410		4	12.5	1/2"	-08
Q410-X		4	12.5	1/2"	-08
Q411		4	10	3/8"	-06

MULTI-COUPLING SERIES	CONFIGURATION	NO. OF LINES	SIZE		
			FIXED PART	inch	Dash
Q412		4	10	3/8"	-06
		1	12.5	1/2"	-08
Q413		8	10	3/8"	-06
Q414		4	10	3/8"	-06
Q414-X		4	10	3/8"	-06
Q415		1	10	3/8"	-06
		1	19	3/4"	-12
		2	25	1"	-06
Q416		10	10	3/8"	-06
Q417		3	10	3/8"	-06
Q418		2	10	3/8"	-06
		1	12.5	1/2"	-08
Q419		3	10	3/8"	-06
Q420		2	25	1"	-16
Q421		5	10	3/8"	-06

Q401 SERIES

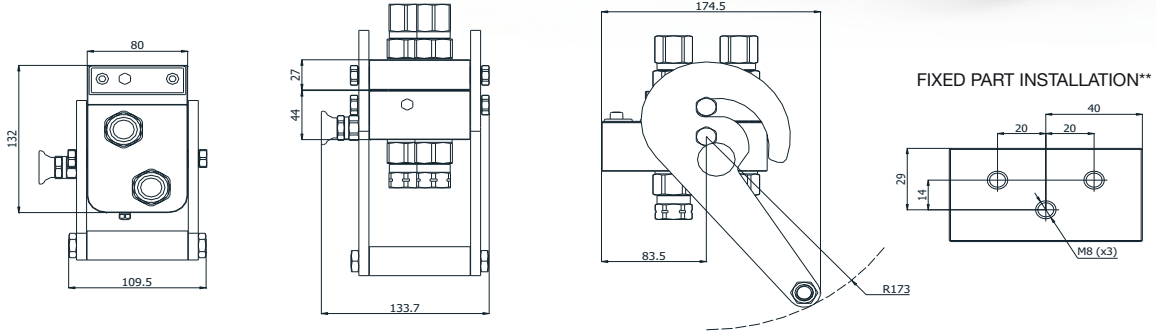
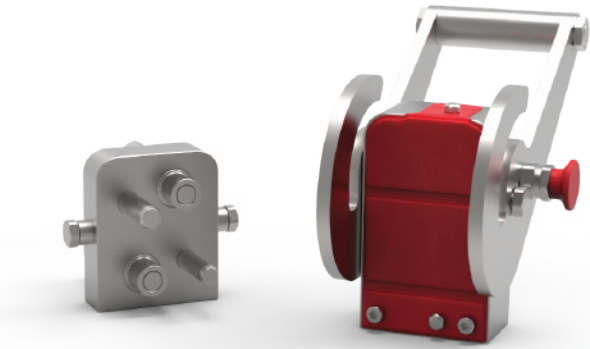
2 LINE MULTI-COUPLING

DOUBLE-SIDED LEVER

LOCKING POSITION: LEFT*

* Right hand locking available on request

** Plate adaptor for frontal fixing available



MULTI-COUPLINGS					TERMINATION END*		
PART NUMBER		SIZE			LINES	DESCRIPTION	THREAD
FIXED PART	MOBILE PART	DN	inch	Dash			
Q401B0F-041-06	Q401B0M-041-06	10	3/8"	-06	2	BSP FEMALE DIN3852-2 TYPE X	3/8" BSP
Q401B0F-041-08	Q401B0M-041-08	10	3/8"	-06	2	BSP FEMALE DIN3852-2 TYPE X	1/2" BSP

Q402 SERIES

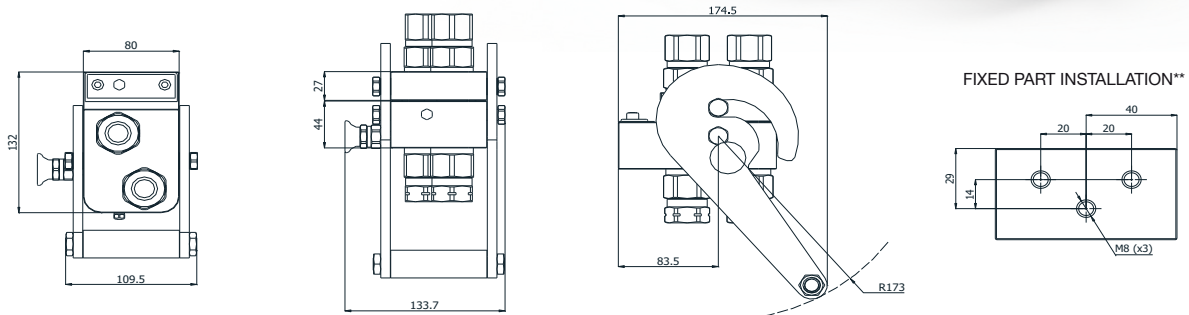
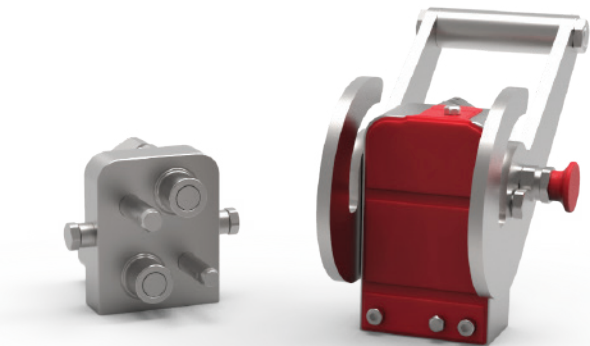
2 LINE MULTI-COUPLING

DOUBLE-SIDED LEVER

LOCKING POSITION: LEFT*

* Right hand locking available on request

** Plate adaptor for frontal fixing available



MULTI-COUPLINGS					TERMINATION END*		
PART NUMBER		SIZE			LINES	DESCRIPTION	THREAD
FIXED PART	MOBILE PART	DN	inch	Dash			
Q402B0F-041-08	Q402B0M-041-08	12.5	1/2"	-08	2	BSP FEMALE DIN3852-2 TYPE X	1/2" BSP
Q402B0F-041-12	Q402B0M-041-12	12.5	1/2"	-08	2	BSP FEMALE DIN3852-2 TYPE X	3/4" BSP

Q403 SERIES

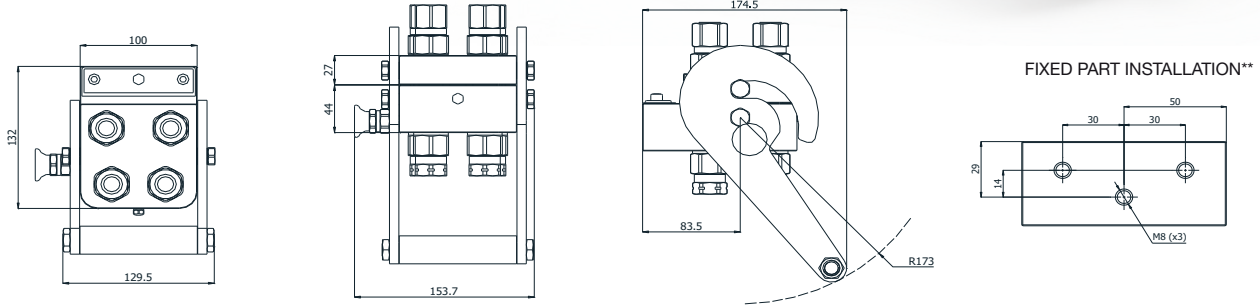
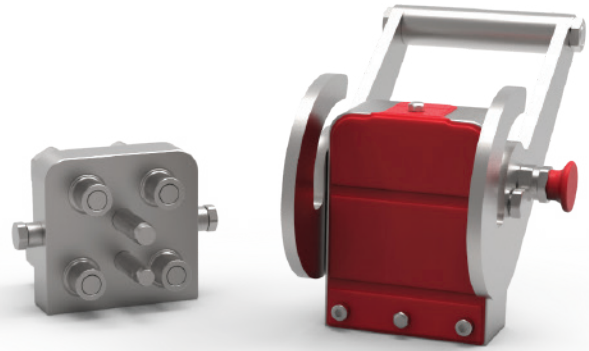
4 LINE MULTI-COUPLING

DOUBLE-SIDED LEVER

LOCKING POSITION: LEFT*

* Right hand locking available on request

** Plate adaptor for frontal fixing available



MULTI-COUPLINGS					TERMINATION END*		
PART NUMBER		SIZE			LINES	DESCRIPTION	THREAD
FIXED PART	MOBILE PART	DN	inch	Dash			
Q403D0F-041-06	Q403DOM-041-06	10	3/8"	-06	4	BSP FEMALE DIN3852-2 TYPE X	3/8" BSP
Q403D0F-120-20	Q403DOM-120-20	10	3/8"	-06	4	METRIC MALE ISO 8434-1 S SERIES	M20x1.5

Q404 SERIES

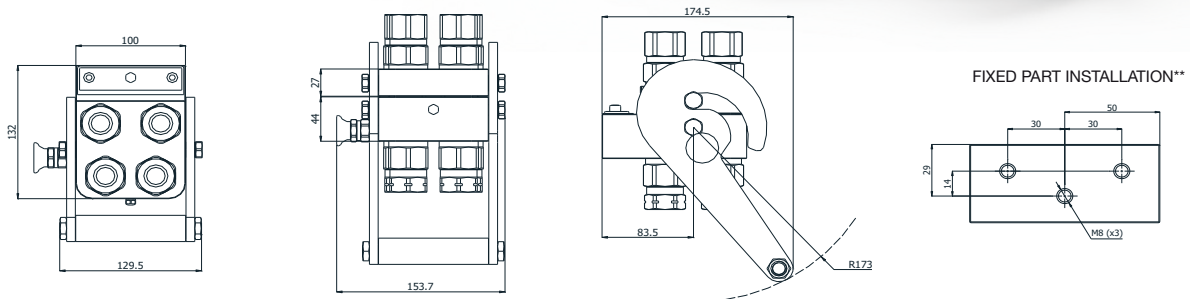
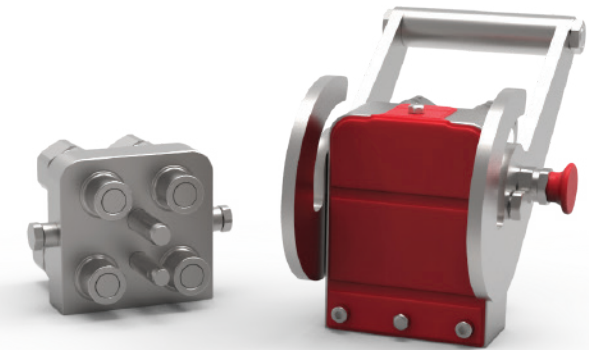
4 LINE MULTI-COUPLING

DOUBLE-SIDED LEVER

LOCKING POSITION: LEFT*

* Right hand locking available on request

** Plate adaptor for frontal fixing available



MULTI-COUPLINGS					TERMINATION END*		
PART NUMBER		SIZE			LINES	DESCRIPTION	THREAD
FIXED PART	MOBILE PART	DN	inch	Dash			
Q404D0F-041-08	Q404DOM-041-08	12.5	1/2"	-08	4	BSP FEMALE DIN3852-2 TYPE X	1/2" BSP

Q405 SERIES

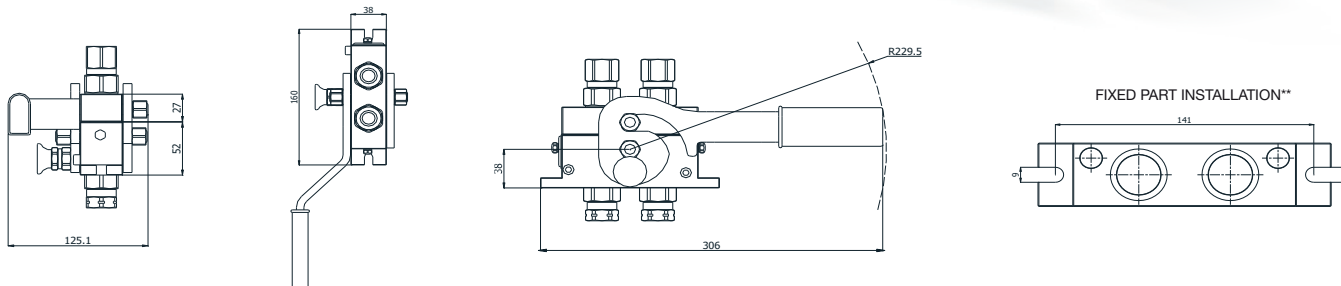
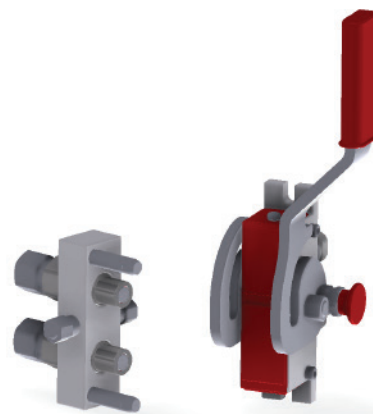
2 LINE MULTI-COUPLING

SINGLE-SIDED LEVER

LOCKING POSITION: LEFT*

* Right hand locking available on request

** Plate adaptor for frontal fixing available



MULTI-COUPLINGS					TERMINATION END*		
PART NUMBER		SIZE			LINES	DESCRIPTION	THREAD
FIXED PART	MOBILE PART	DN	inch	Dash			
Q405B0F-041-06	Q405B0M-041-06	10	3/8"	-06	2	BSP FEMALE DIN3852-2 TYPE X	3/8" BSP

Q406 SERIES

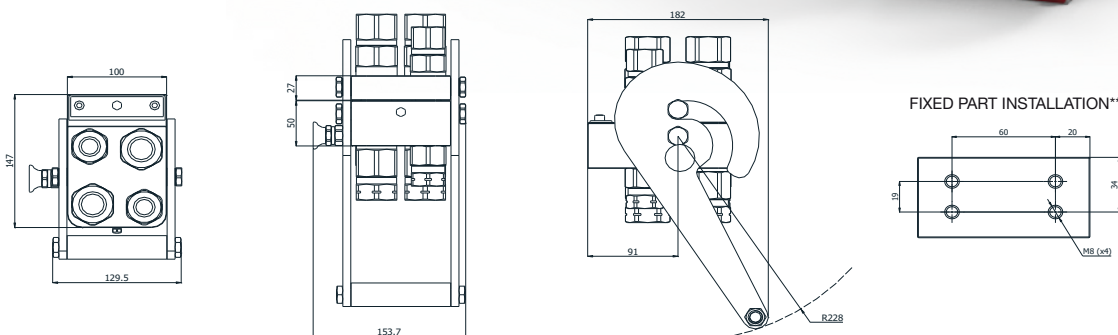
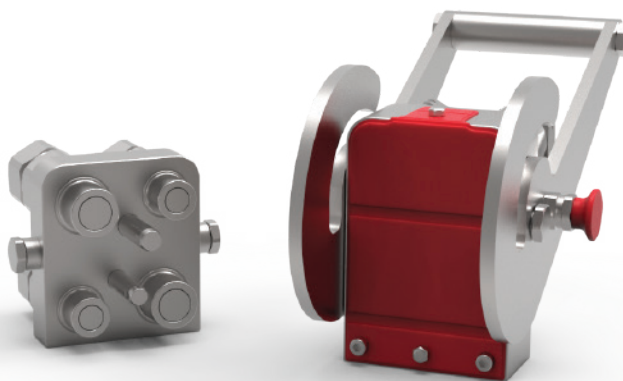
2+2 LINE MULTI-COUPLING

DOUBLE-SIDED LEVER

LOCKING POSITION: LEFT*

* Right hand locking available on request

** Plate adaptor for frontal fixing available



MULTI-COUPLINGS					TERMINATION END*		
PART NUMBER		SIZE			LINES	DESCRIPTION	THREAD
FIXED PART	MOBILE PART	DN	inch	Dash			
Q406D0F-AA	Q406D0M-AA	12.5	1/2"	-08	2	BSP FEMALE DIN3852-2 TYPE X	1/2" BSP
		19	3/4"	-12	2	BSP FEMALE DIN3852-2 TYPE X	3/4" BSP

Q407 SERIES

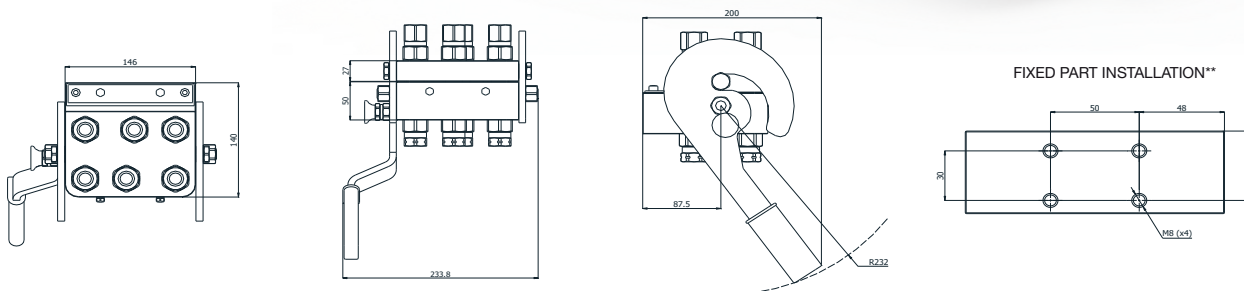
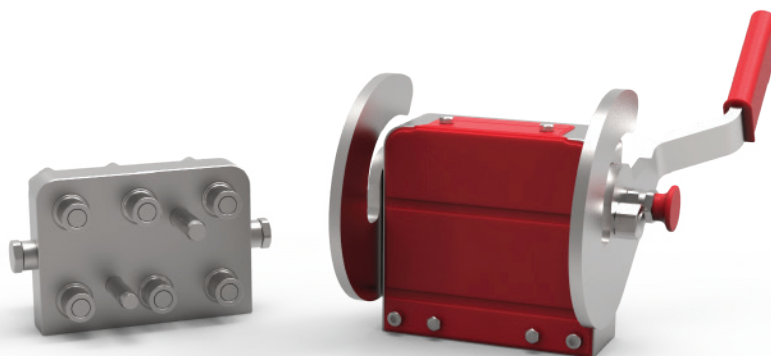
6 LINE MULTI-COUPLING

SINGLE-SIDED LEVER

LOCKING POSITION: LEFT*

* Right hand locking available on request

** Plate adaptor for frontal fixing available



MULTI-COUPLINGS					TERMINATION END*		
PART NUMBER		SIZE			LINES	DESCRIPTION	THREAD
FIXED PART	MOBILE PART	DN	inch	Dash			
Q407F0F-041-06	Q407F0M-041-06	10	3/8"	-06	6	BSP FEMALE DIN3852-2 TYPE X	3/8" BSP

Q408 SERIES

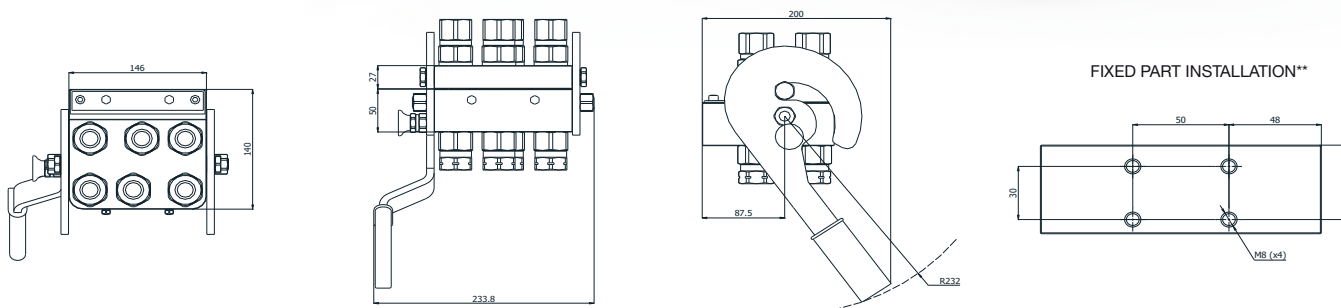
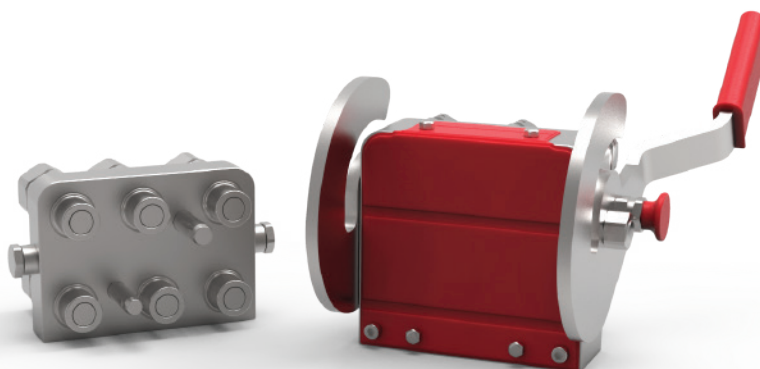
6 LINE MULTI-COUPLING

SINGLE-SIDED LEVER

LOCKING POSITION: LEFT*

* Right hand locking available on request

** Plate adaptor for frontal fixing available



MULTI-COUPLINGS					TERMINATION END*		
PART NUMBER		SIZE			LINES	DESCRIPTION	THREAD
FIXED PART	MOBILE PART	DN	inch	Dash			
Q408F0F-041-08	Q408F0M-041-08	12.5	1/2"	-08	6	BSP FEMALE DIN3852-2 TYPE X	1/2" BSP

Q409 SERIES

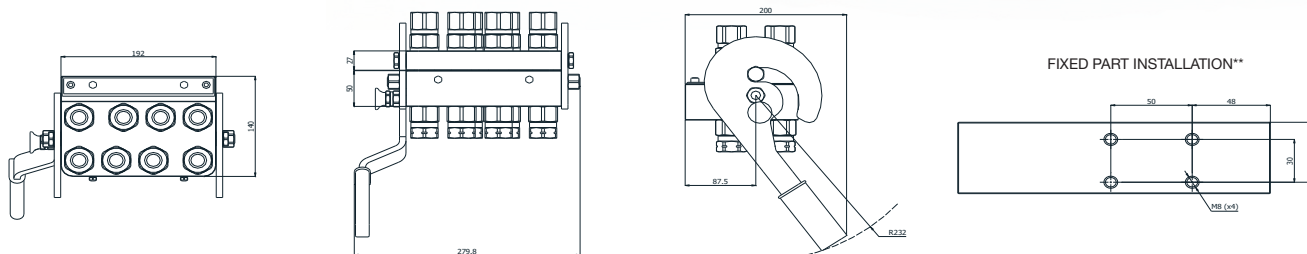
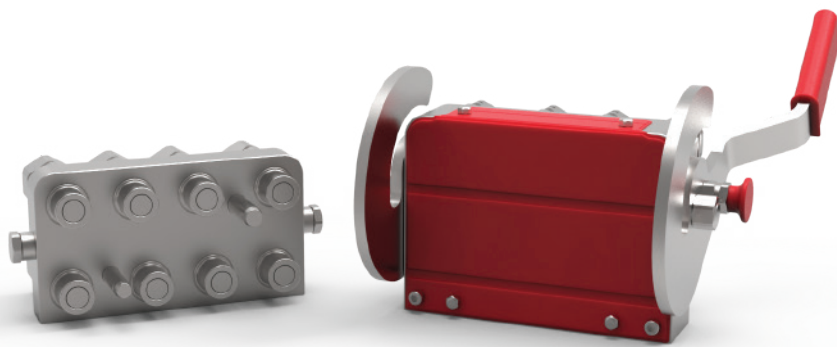
8 LINE MULTI-COUPLING

SINGLE-SIDED LEVER

LOCKING POSITION: LEFT*

* Right hand locking available on request

** Plate adaptor for frontal fixing available



MULTI-COUPLINGS					TERMINATION END*		
PART NUMBER		SIZE			LINES	DESCRIPTION	THREAD
FIXED PART	MOBILE PART	DN	inch	Dash			
Q409H0F-041-08	Q409H0M-041-08	12.5	1/2"	-08	8	BSP FEMALE DIN3852-2 TYPE X	1/2" BSP

Q410 SERIES

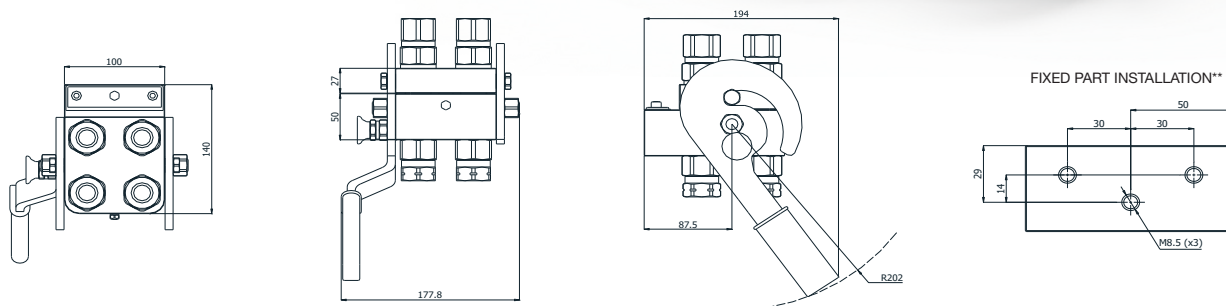
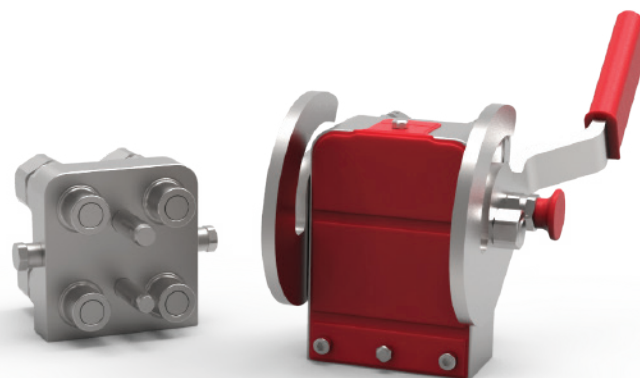
4 LINE MULTI-COUPLING

SINGLE-SIDED LEVER

LOCKING POSITION: LEFT*

* Right hand locking available on request

** Plate adaptor for frontal fixing available



MULTI-COUPLINGS					TERMINATION END*		
PART NUMBER		SIZE			LINES	DESCRIPTION	THREAD
FIXED PART	MOBILE PART	DN	inch	Dash			
Q410D0F-041-08	Q410D0M-041-08	12.5	1/2"	-08	4	BSP FEMALE DIN3852-2 TYPE X	1/2" BSP

Q410-X SERIES

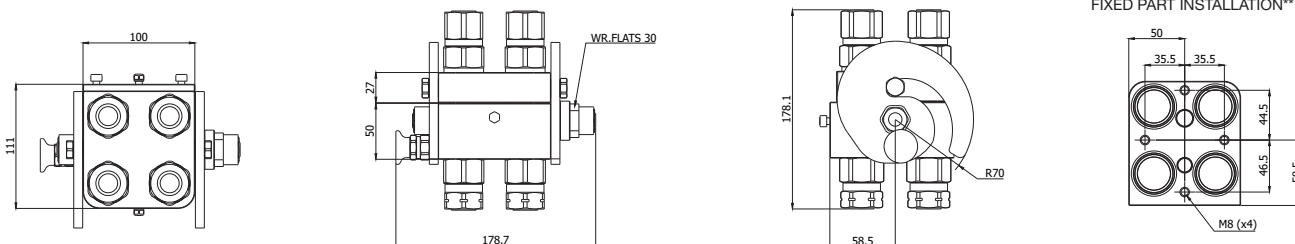
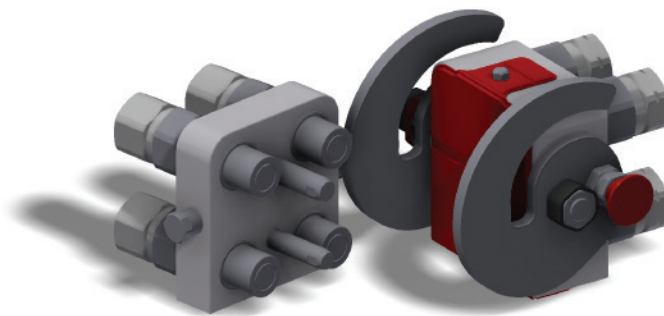
4 LINES SIZE -08

CONNECTION BY WRENCH

LOCKING POSITION: LEFT*

* Right hand locking available on request

** Plate adaptor for frontal fixing available



MULTI-COUPLINGS					TERMINATION END*		
PART NUMBER		SIZE			LINES	DESCRIPTION	THREAD
FIXED PART	MOBILE PART	DN	inch	Dash			
Q410D0F-041-08XA	Q410D0M-041-08	12.5	1/2"	-08	4	BSP FEMALE DIN3852-2 TYPE X	1/2" BSP

Q411 SERIES

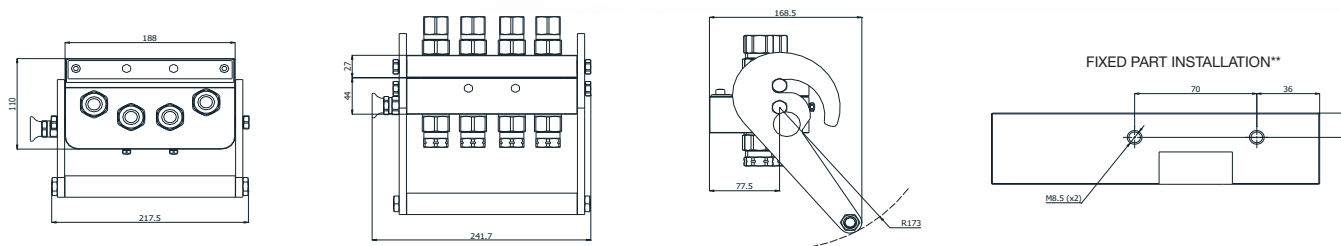
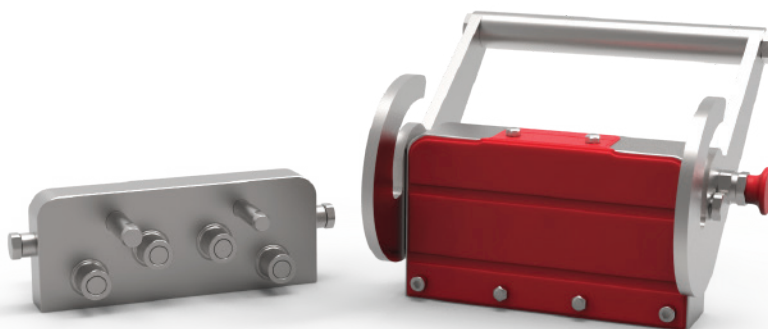
4 LINE MULTI-COUPLING

DOUBLE-SIDED LEVER

LOCKING POSITION: LEFT*

* Right hand locking available on request

** Plate adaptor for frontal fixing available



MULTI-COUPLINGS					TERMINATION END*		
PART NUMBER		SIZE			LINES	DESCRIPTION	THREAD
FIXED PART	MOBILE PART	DN	inch	Dash			
Q411D0F-041-06	Q411D0M-041-06	10	3/8"	-06	4	BSP FEMALE DIN3852-2 TYPE X	3/8" BSP

Q412 SERIES

4 LINES SIZE -06

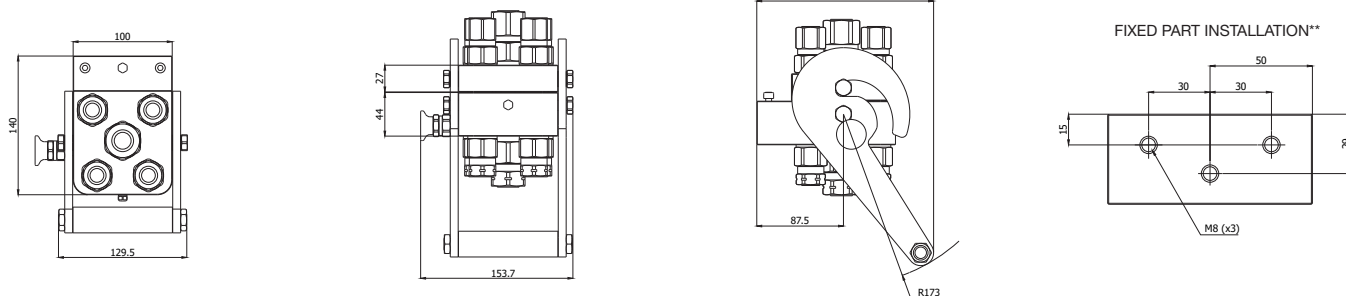
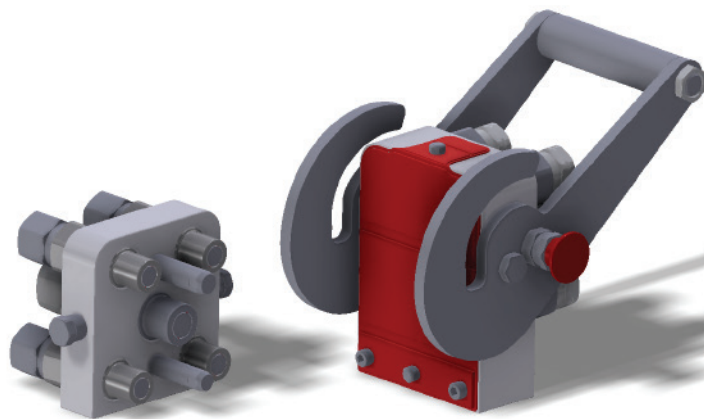
1 LINE SIZE -08

DOUBLE-SIDED LEVER

LOCKING POSITION: LEFT*

* Right hand locking available on request

** Plate adaptor for frontal fixing available



MULTI-COUPPLINGS					TERMINATION END*		
PART NUMBER		SIZE			LINES	DESCRIPTION	THREAD
FIXED PART	MOBILE PART	DN	inch	Dash			
Q412E0F-AA	Q412E0M-AA	10	3/8"	-06	4	BSP FEMALE DIN3852-2 TYPE X	3/8" BSP
		12.5	1/2"	-08	1	BSP FEMALE DIN3852-2 TYPE X	1/2" BSP

Q413 SERIES

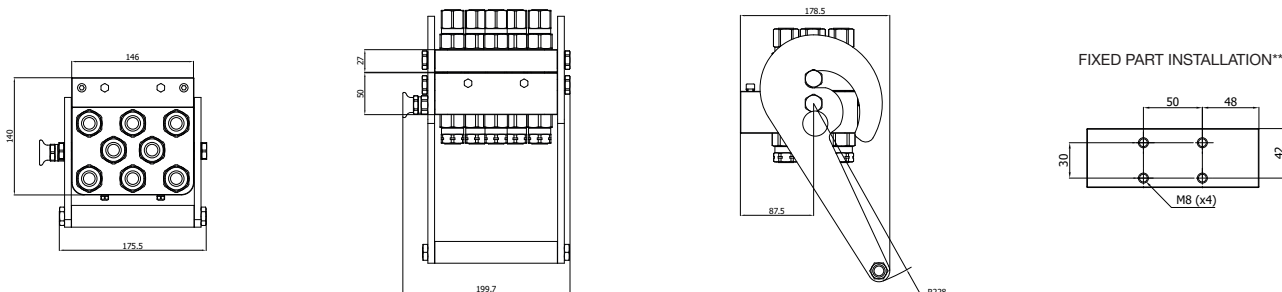
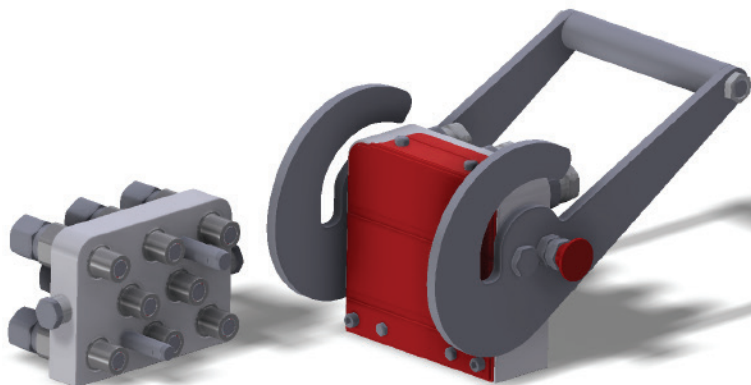
8 LINES SIZE -06

DOUBLE-SIDED LEVER

LOCKING POSITION: LEFT*

* Right hand locking available on request

** Plate adaptor for frontal fixing available



MULTI-COUPPLINGS					TERMINATION END*		
PART NUMBER		SIZE			LINES	DESCRIPTION	THREAD
FIXED PART	MOBILE PART	DN	inch	Dash			
Q413H0F-041-06	Q413H0M-041-06	10	3/8"	-06	8	BSP FEMALE DIN3852-2 TYPE X	3/8" BSP

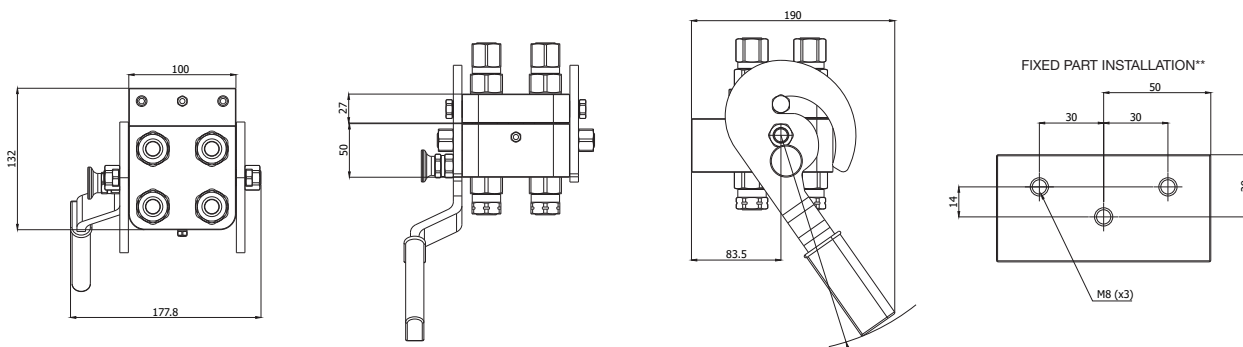
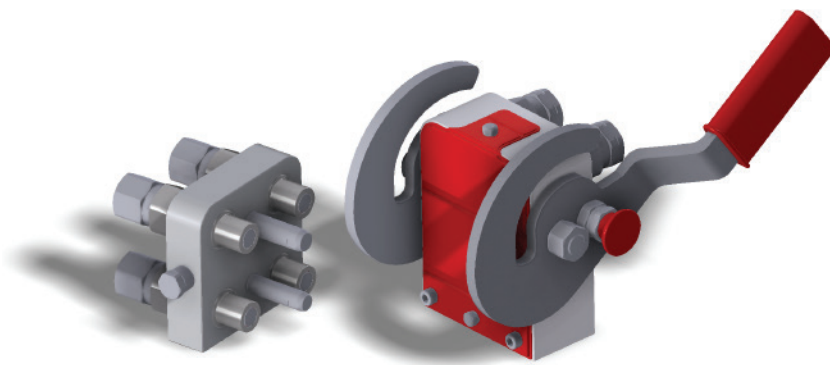
Q414 SERIES

4 LINES SIZE -06

SINGLE-SIDED LEVER

LOCKING POSITION: LEFT*

* Right hand locking available on request
 ** Plate adaptor for frontal fixing available



MULTI-COUPLINGS					TERMINATION END*		
PART NUMBER		SIZE			LINES	DESCRIPTION	THREAD
FIXED PART	MOBILE PART	DN	inch	Dash			
Q414D0F-041-06	Q414D0M-041-06	10	3/8"	-06	4	BSP FEMALE DIN3852-2 TYPE X	3/8" BSP

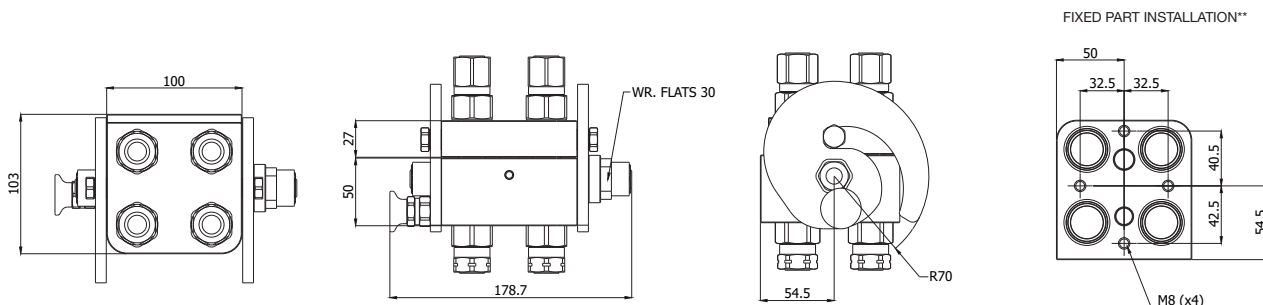
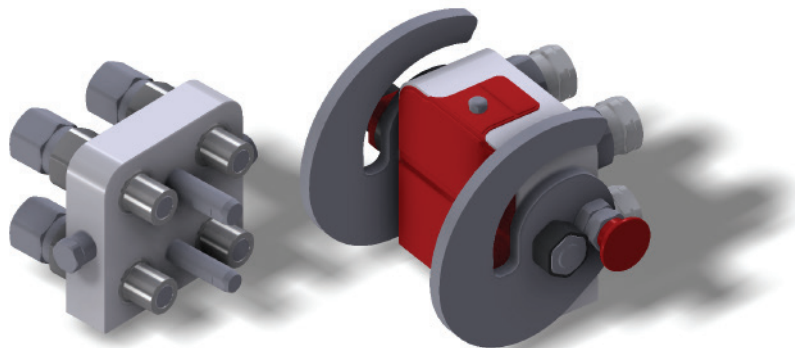
Q414-X SERIES

4 LINES SIZE -06

CONNECTION BY WRENCH

LOCKING POSITION: LEFT*

* Right hand locking available on request
 ** Plate adaptor for frontal fixing available



MULTI-COUPLINGS					TERMINATION END*		
PART NUMBER		SIZE			LINES	DESCRIPTION	THREAD
FIXED PART	MOBILE PART	DN	inch	Dash			
Q414D0F-041-06XA	Q414D0M-041-06	10	3/8"	-06	4	BSP FEMALE DIN3852-2 TYPE X	3/8" BSP

Q415 SERIES

1 LINE SIZE -06

1 LINE SIZE -12

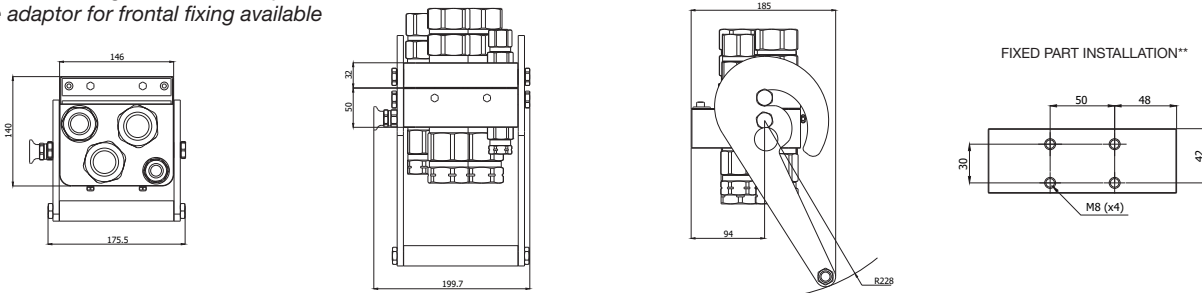
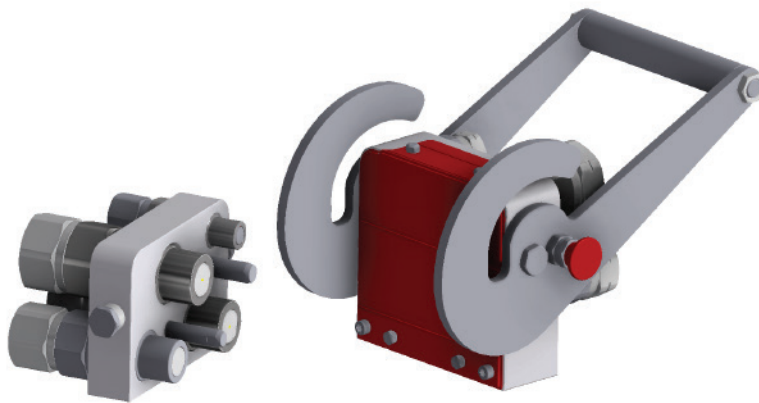
2 LINES SIZE -16

DOUBLE-SIDED LEVER

LOCKING POSITION: LEFT*

* Right hand locking available on request

** Plate adaptor for frontal fixing available



MULTI-COUPPLINGS					TERMINATION END*		
PART NUMBER		SIZE			LINES	DESCRIPTION	THREAD
FIXED PART	MOBILE PART	DN	inch	Dash			
Q415D0F-AA	Q415D0M-AA	10	3/8"	-06	1	BSP FEMALE DIN3852-2 TYPE X	3/8" BSP
		19	3/4"	-12	1	BSP FEMALE DIN3852-2 TYPE X	3/4" BSP
		25	1"	-16	2	BSP FEMALE DIN3852-2 TYPE X	1" BSP

Q416 SERIES

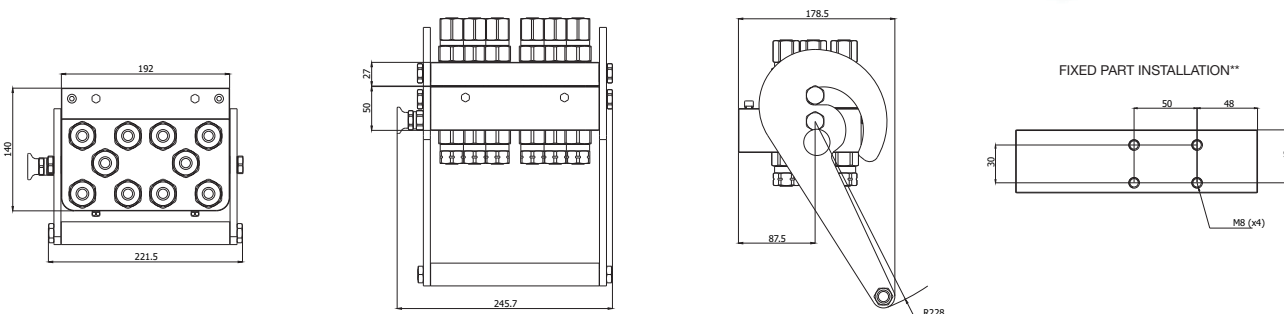
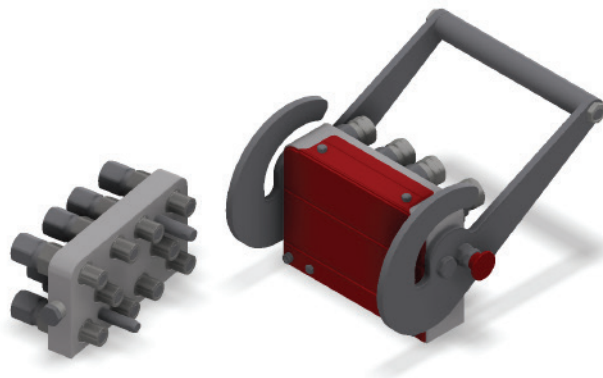
10 LINES SIZE -06

DOUBLE-SIDED LEVER

LOCKING POSITION: LEFT*

* Right hand locking available on request

** Plate adaptor for frontal fixing available



MULTI-COUPPLINGS					TERMINATION END*		
PART NUMBER		SIZE			LINES	DESCRIPTION	THREAD
FIXED PART	MOBILE PART	DN	inch	Dash			
Q416K0F-041-04	Q416K0M-041-04	10	3/8"	-06	10	BSP FEMALE DIN3852-2 TYPE X	1/4" BSP

Q417 SERIES

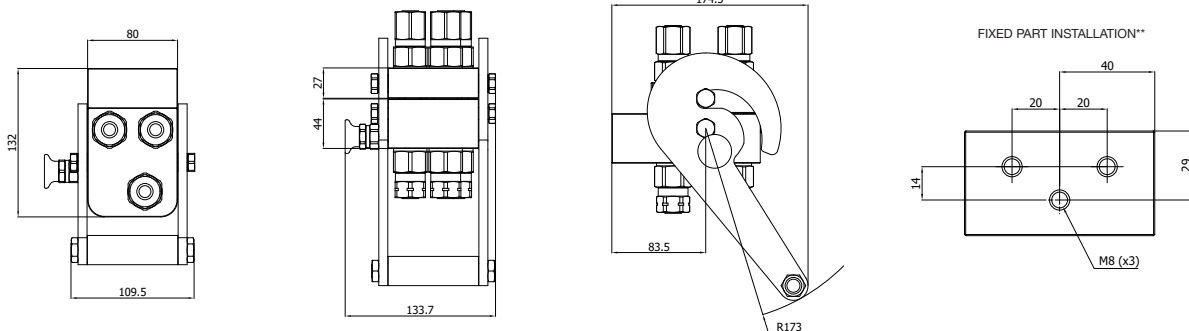
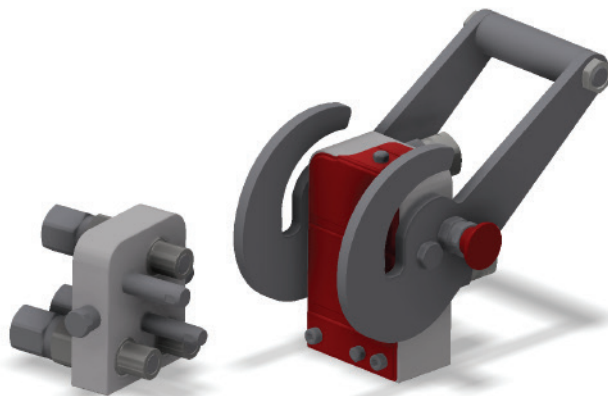
3 LINES SIZE -06

DOUBLE-SIDED LEVER

LOCKING POSITION: LEFT*

* Right hand locking available on request

** Plate adaptor for frontal fixing available



MULTI-COUPPLINGS					TERMINATION END*		
PART NUMBER		SIZE			LINES	DESCRIPTION	THREAD
FIXED PART	MOBILE PART	DN	inch	Dash			
Q417C0F-041-04	Q417C0M-041-04	10	3/8"	-06	3	BSP FEMALE DIN3852-2 TYPE X	1/4" BSP

Q418 SERIES

2 LINES SIZE -06

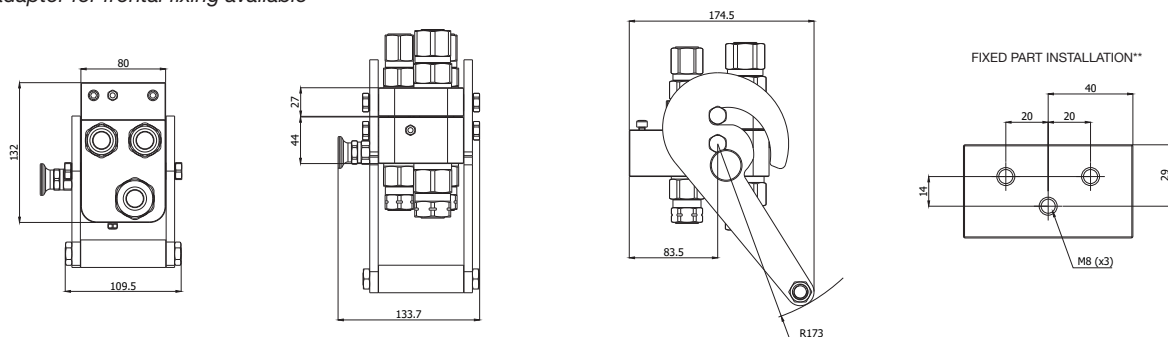
1 LINE SIZE -08

DOUBLE-SIDED LEVER

LOCKING POSITION: LEFT*

* Right hand locking available on request

** Plate adaptor for frontal fixing available



MULTI-COUPPLINGS					TERMINATION END*		
PART NUMBER		SIZE			LINES	DESCRIPTION	THREAD
FIXED PART	MOBILE PART	DN	inch	Dash			
Q418C0F-041-08	Q418C0M-041-08	10	3/8"	-06	2	BSP FEMALE DIN3852-2 TYPE X	1/2" BSP
		12.5	1/2"	-08	1	BSP FEMALE DIN3852-2 TYPE X	1/2" BSP

Q419 SERIES

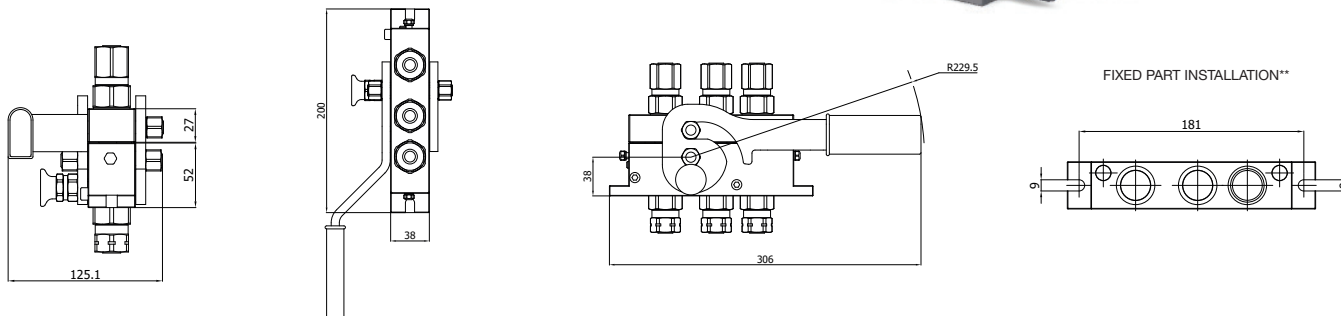
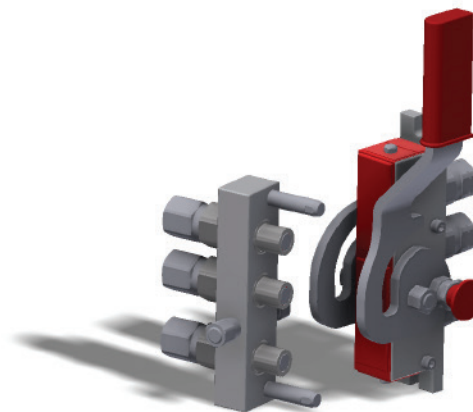
3 LINES SIZE -06

SINGLE-SIDED LEVER

LOCKING POSITION: LEFT*

* Right hand locking available on request

** Plate adaptor for frontal fixing available



MULTI-COUPPLINGS					TERMINATION END*		
PART NUMBER		SIZE			LINES	DESCRIPTION	THREAD
FIXED PART	MOBILE PART	DN	inch	Dash			
Q419C0F-041-04	Q419C0M-041-04	10	3/8"	-06	3	BSP FEMALE DIN3852-2 TYPE X	1/4" BSP

Q420 SERIES

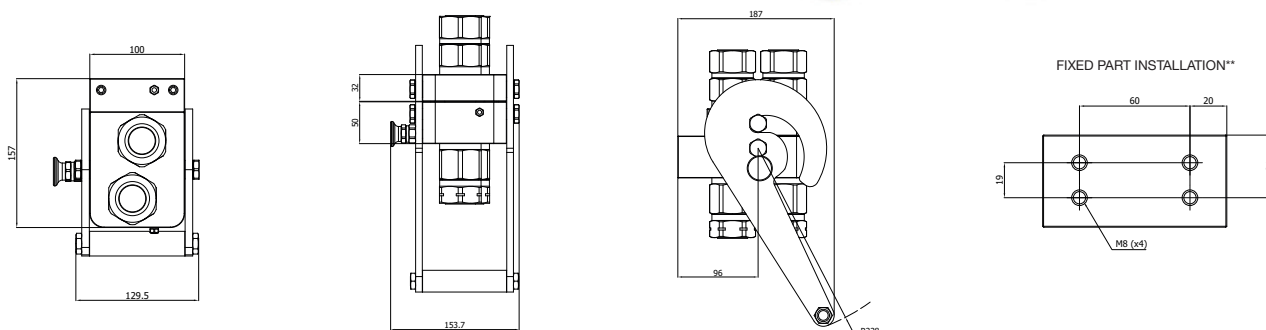
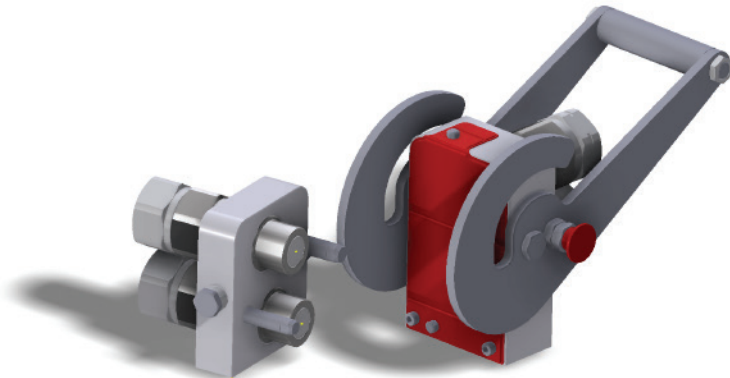
2 LINES SIZE -16

DOUBLE-SIDED LEVER

LOCKING POSITION: LEFT*

* Right hand locking available on request

** Plate adaptor for frontal fixing available



MULTI-COUPPLINGS					TERMINATION END*		
PART NUMBER		SIZE			LINES	DESCRIPTION	THREAD
FIXED PART	MOBILE PART	DN	inch	Dash			
Q420B0F-041-16	Q420B0M-041-16	25	1"	-16	2	BSP FEMALE DIN3852-2 TYPE X	1" BSP

Q421 SERIES

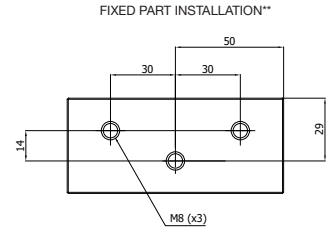
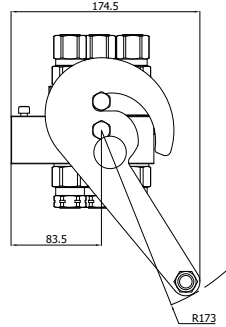
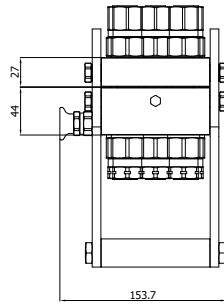
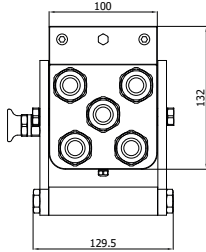
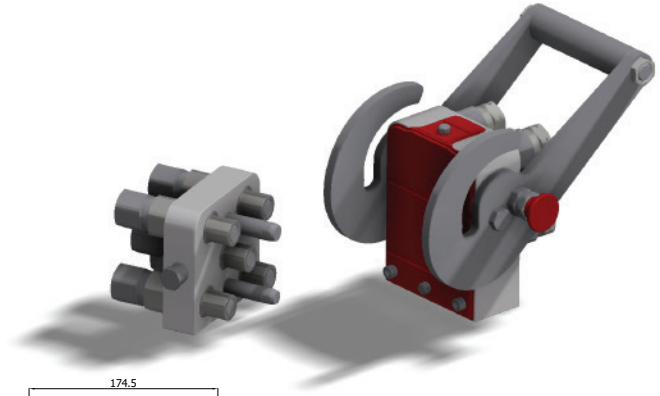
5 LINES SIZE -06

DOUBLE-SIDED LEVER

LOCKING POSITION: LEFT*

* Right hand locking available on request

** Plate adaptor for frontal fixing available



MULTI-COUPLINGS					TERMINATION END*		
PART NUMBER		SIZE			LINES	DESCRIPTION	THREAD
FIXED PART	MOBILE PART	DN	inch	Dash			
Q421E0F-041-06	Q421E0M-041-06	10	3/8"	-06	5	BSP FEMALE DIN3852-2 TYPE X	3/8" BSP

MULTICONNECTOR APPLICATIONS

Multiconnectors are suitable for a wide range of applications, including agriculture, construction and transport. They support efficient connection and disconnection of multiple hydraulic lines, improving safety and reducing downtime in demanding environments. This makes Multiconnectors a reliable solution for high-use machinery, supporting speed, durability and consistent performance.

AGRICULTURE

- Front Loaders for Tractors
- Combine Harvesters
- Large Machines



CONSTRUCTION

- Compact Excavators
- Demolition Excavators
- Long Reach Cranes



TRANSPORT

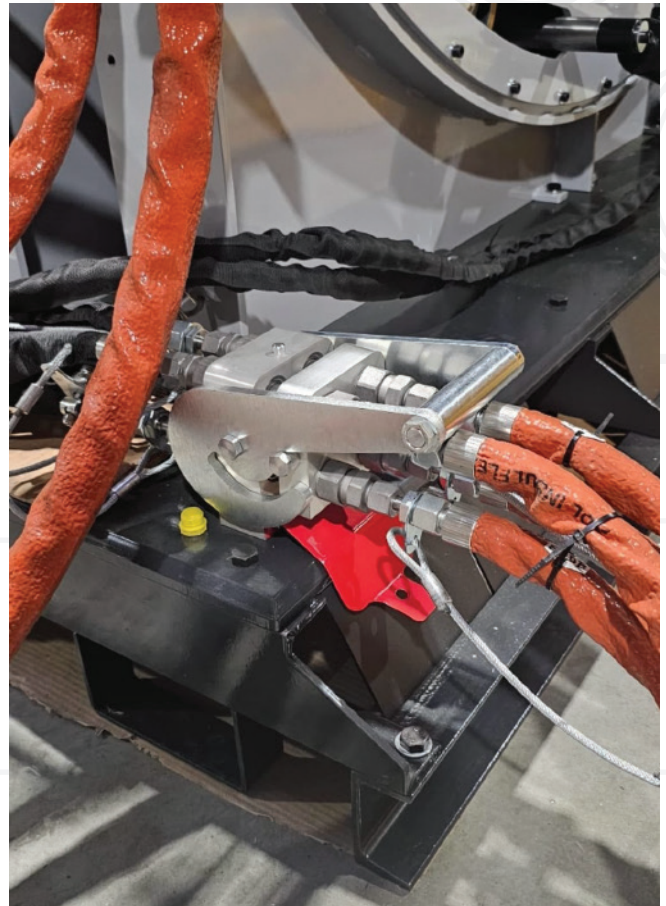
- Road Border Cleaning Machines
- Trucks with Hydraulic Cranes



CASE STUDIES



Multiconnectors used for ariel platforms.



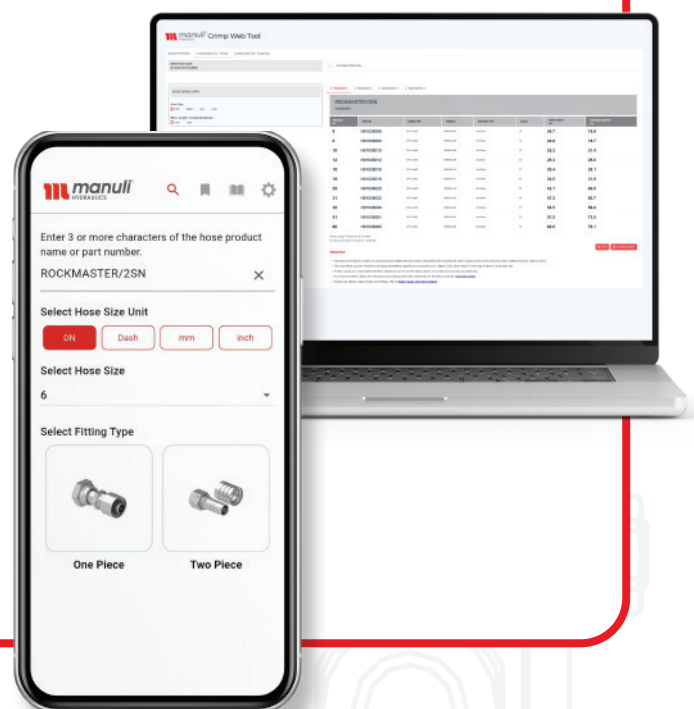
Multiconnectors used for assembly machines.

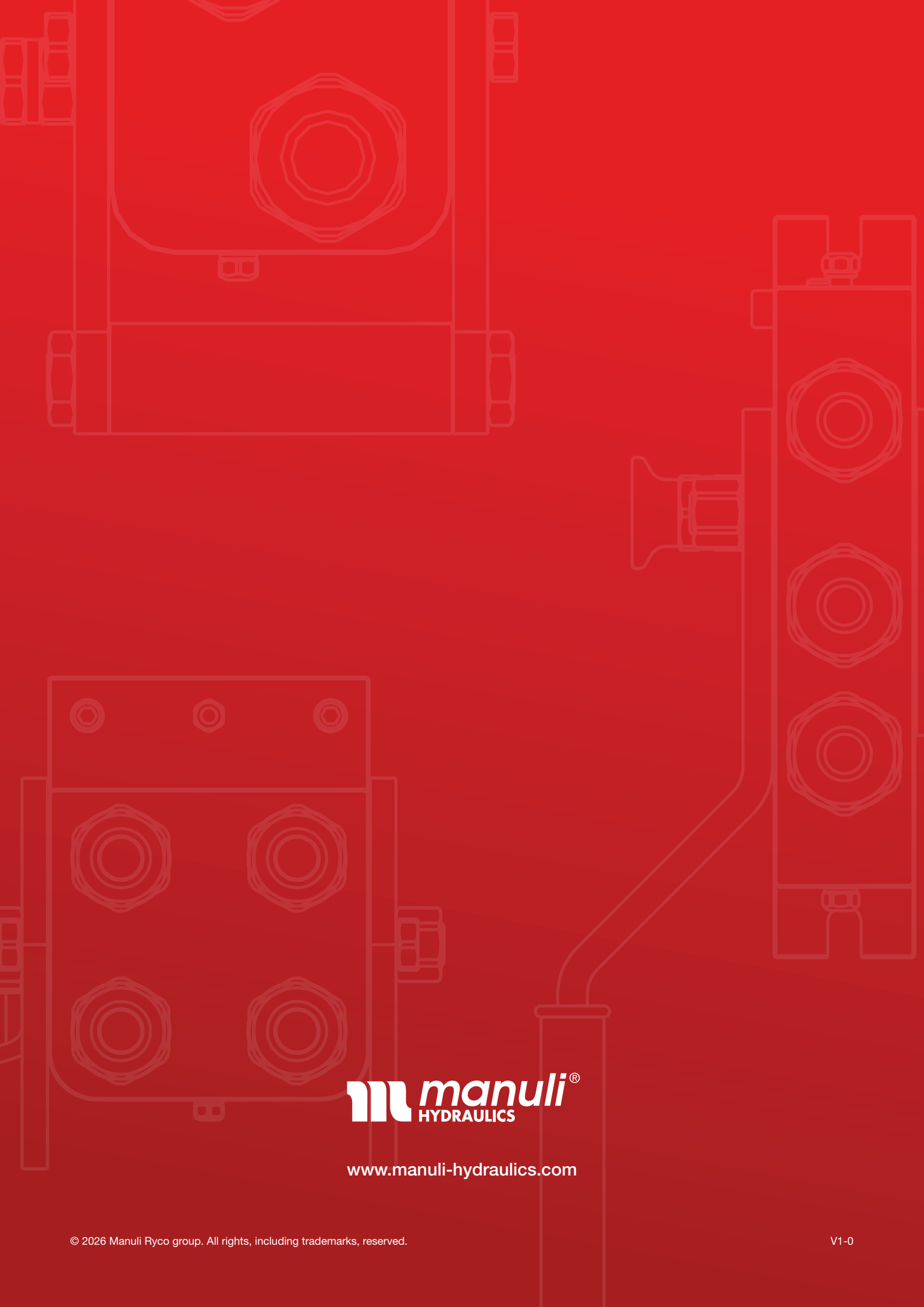


MANULI DIGITAL CRIMP TOOLS

Stay up to date using Manuli's Digital Crimp Tools, available as an App and a Web version, our Crimp Tools are your go-to resource for accurate, efficient, and safe hydraulic hose crimping. Designed with professionals in mind, this innovative tool grants instant access to the latest crimp specifications, ensuring precision, and reliability in every assembly.

Whether in the workshop or on the go, Manuli Digital Crimp Tools provide real-time access to an extensive database of hose and fitting specifications, helping to reduce downtime and boost productivity.





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