

rodaindustria **IBÉRICA S.A.**

XXL HOSES & CONNECTORS

LARGE BORE CHOICE FOR HIGH FLOW RATES



manuli[®]
HYDRAULICS

XXL HOSES & CONNECTORS

APPLICATIONS FOCUS

High power systems are increasing their capacity in the hydraulic market and require appropriate connectors. Since it is good practice to cap the fluid velocity at a max value (< 10 meters/sec) in order to limit the fluid turbulence, the only way to increase the power transfer capacity of a connector **is to increase its size (S) and its pressure resistance (p)**.

Manuli XXL products have been designed to meet these requirements and are the ideal solution for any high power transmission in large hydraulic equipment, working with high flow rates (suction/return lines) and/or medium to high pressures (pressure/discharge lines).

A growing sensibility to efficient Fluid Power is now pushing manufacturers and designers to reduce any type of power loss throughout the hydraulic system. Connectors can bear important contribution in reducing localised and distributed pressure losses.

A way to reach this target is to increase the size of connectors which reduces the fluid velocity for a given transferred power.

The same Manuli XXL products can be an ideal product when pressure drops need to be reduced in order to increase the efficiency of the hydraulic system.

The main applications where **high power/high efficient Hydraulics** is required are giant machines for a lot of industrial activities: open pit and underground mining, shipyards and offshore platforms, dredging and quarrying, large construction equipment, industrial sites (steel mills, refineries), etc.

The constant need of higher output capacity and productivity is stimulating a continuous improvement on this equipment for higher power and better efficiency which require advanced hydraulic components..

Hydraulic Power (W)
transmitted through connectors is given by

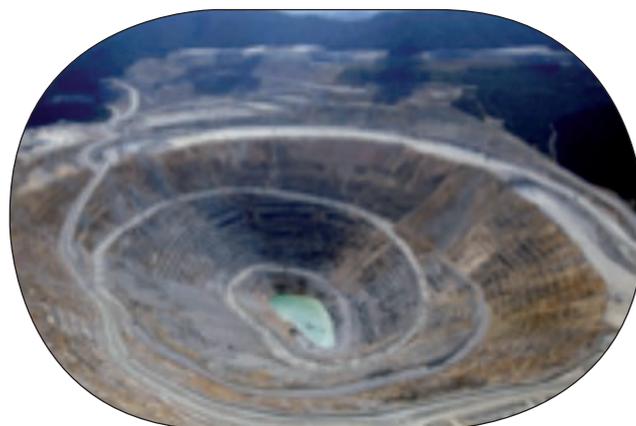
$$W = p \times Q$$

p = working pressure

Q = flow rate

$$Q = S \times v$$

(S is the cross section of the connector
and v is the local fluid velocity).



XXL HOSES & CONNECTORS

APPLICATIONS FOCUS

The XXL hose range achieves in all cases big hydraulic power transmission rates, as showed in this chart by hose type and size

Hose type		Hose structure	DN (mm) / -dash inch	63 / -40 2-1/2"	76 / -48 3"	89 / -56 3-1/2"	102 / -64 4"
XTRAFLOW	HIGH TEMP. LOW PRESSURE	XTRAFLOW/HT 2 wire braids, special polymer for high temperature 135°C.	WP (MPa)	3,5	3,5	3,5	
			Fitting solution	MF	MF	MF	
			Min. Bend Radius (mm)	254	355	475	
	LOW-MEDIUM PRESSURE	XTRAFLOW/2WB 2 wire braids robust structure, "SHARC" Super High Abrasion Resistant Cover	WP (MPa)	10,5	8,0	3,5	
			Fitting solution	MS	MS	MS	
			Min. Bend Radius (mm)	510	510	710	
XTRAFLOW/4WS 4 wire spirals, compact architecture, "SHARC" Super High Abrasion Resistant Cover		WP (MPa)	14,0	10,5	8,0	3,5 (*)	
		Fitting solution	MS	MS	MS	MS	
		Min. Bend Radius (mm)	700	700	800	900	
DIAMONDSPIR	HIGH PRESSURE	DIAMONDSPIR/14 wire spirals structures, compact architecture, "ROCKMASTER" cover, INTERLOCK fittings	WP (MPa)	-	14,0		
			Fitting solution	-	IP		
			Min. Bend Radius (mm)	-	700		
		DIAMONDSPIR/21 wire spirals structures, compact architecture, "ROCKMASTER" cover, INTERLOCK fittings	WP (MPa)	21,0	21,0		
			Fitting solution	IP	IP		
			Min. Bend Radius (mm)	700	900		
		DIAMONDSPIR/35 wire spirals structures, robust architecture, "ROCKMASTER" cover, INTERLOCK fittings	WP (MPa)	35,0	35,0		
			Fitting solution	IP	IS		
			Min. Bend Radius (mm)	800	1000		

IP=Interlock Plus
IS=InterLock Super
MS=MultiSpiral
MF=Multifit

(*) Available since the year 2013

All hoses are offered with compatible fittings, where the integrated design guarantees of optimum performance and reliability, lab tested and validated in field. The XTRAFLOW hose range uses simple and cost effective NO-SKIVE fittings, while the DIAMONDSPIR hoses are coupled with the robust and reliable INTERLOCK technology.

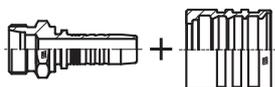
The XXL range is supported by all applicable termination ends, in particular:

- Code 61 and 62 SAE flanges and NPTF males for general hydraulics;
- FLUSHFIT staple-lock fittings for long wall mining;
- An extension of the Manuli XTRAFLLANGE for any high pressure and heavy duty applications
- A unique and innovative solution of an integrated dynamic swivel (ROTOFIT), immediately available in 2 1/2" (other sizes to be released upon request)

XXL HOSES & CONNECTORS

APPLICATIONS FOCUS

The reliability of the fluid connectors range is based on an actual product integration that only Manuli Hydraulics can offer: hoses + fittings + crimp machine are designed together, in order to achieve robust and long lasting solutions.



XXL hoses



XXL fittings



MS800

4" Hydraulic hoses
6" Industrial hoses



MS 800 is the appropriate crimping machine, designed with the necessary tonnage (over 800 tons) preventing the need to look for doubtful commercial machines to be used under the assembler responsibility.

XXL hose range is fully integrated with the new MS800 crimp machine. The result is a continuous assembling service on large bore hoses

XXL HOSES & CONNECTORS

PRODUCTS HIGHLIGHTS

Manuli Hydraulics' **new XXL hoses and connectors are the safe and appropriate choice.**

The XXL hoses and connectors range is designed with innovative structures and advanced materials in order to achieve the necessary targets of robustness and reliability, meeting the severe working conditions of any application.

The size range is from 2-1/2" to 4", above the traditional hydraulic specifications. Large dimensions should offer an easy handling for installation and routing. In some cases medium to high temperatures exist and hoses should be compliant in any case.

The XXL hose range is composed by medium-low pressures and high pressures hose families, to be selected according to the circuit in the hydraulic system:

A - the medium-low pressure families for return/suction lines and auxiliary systems

XTRAFLOW/HT: low pressure hose for very high temperature applications (135 °C)

XTRAFLOW/2WB: low pressure hose with wire braid construction

XTRAFLOW/4WS: medium pressure hose with spiral construction

B - the high pressure families for feed lines, pressure and discharge lines or special applications; the product range is designed with an isobaric approach and is available in the following pressure levels

DIAMONDSPIR/14: 140 bar

DIAMONDSPIR/21: 210 bar

DIAMONDSPIR/35: 350 bar

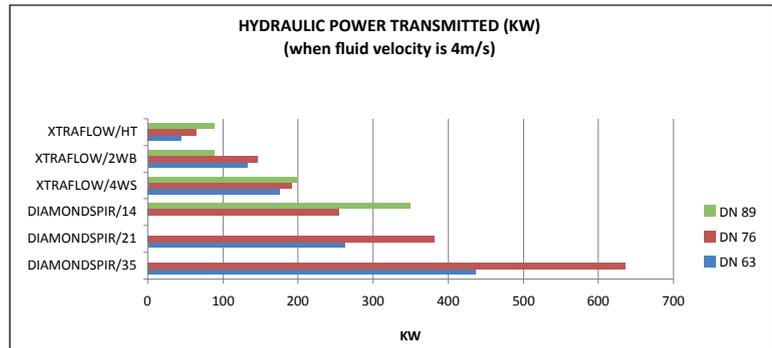


XXL HOSES & CONNECTORS

CUSTOMER ADDED VALUES

The complete hose range is a robust product offer able to meet any possible application of **high pressure and high flow rate requirements** in the above described applications. Within the range, two products in particular have innovative designs and performance:

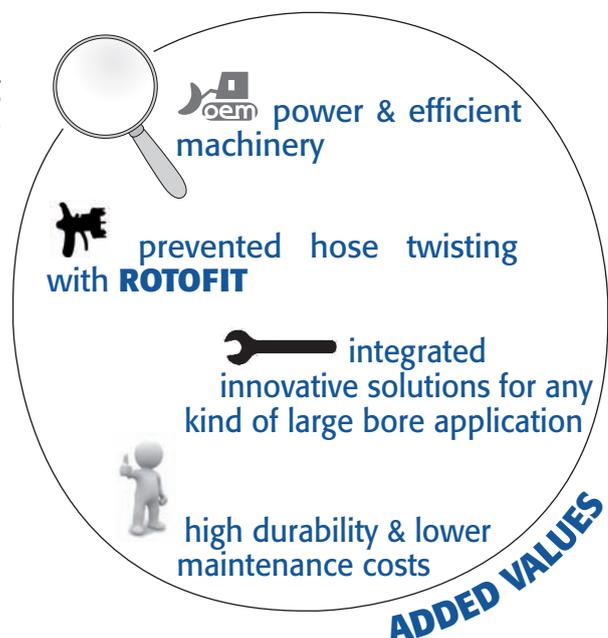
- 1 - **XTRAFLOW/4WS 4"**: a new DN 100 spiral construction with high kink/collapse resistance to be applied in any severe configuration
- 2 - **DIAMONDSPIR/35 3"**: an innovative DN 76 hose construction having a unique pressure rating for this size (350 bar)



Main added values for customers:

- **Hydraulic manufacturers** are allowed to design and build **more powerful and efficient machinery**.
- **Hose assemblers** can be selected as **qualified partners** of speciality products and can increase their business in this developing technological market segment.
- Both partners can enjoy the robustness of the Manuli integrated design, being assured of its performance and reliability for the described mission profile. No need to find a fitting, crimping or machine solution in the market, mismatching products with the need of testing and approving the final assembly. This is a key issue in any hydraulic application, but it becomes even more important in this case, since product alternatives are limited or non-existent in this innovative field.
- **Designers** and **installers** appreciate the reduced bend radius of the XTRAFLOW family and **easy handling** without any risk of hose kinking and collapse.
- **Severe hose installations** with possible twist on hoses can benefit of the innovative **ROTOFIT**, a unique termination end able to swivel under pressure to **prevent hose twisting**.
- All hoses of the XXL line features compatibility with a **wide selection of modern hydraulic oils** in the market without any limitation in use.

As a result of these features for everybody, the hose line is proven to offer a high field durability, reducing the maintenance cost for hose assemblies replacement.

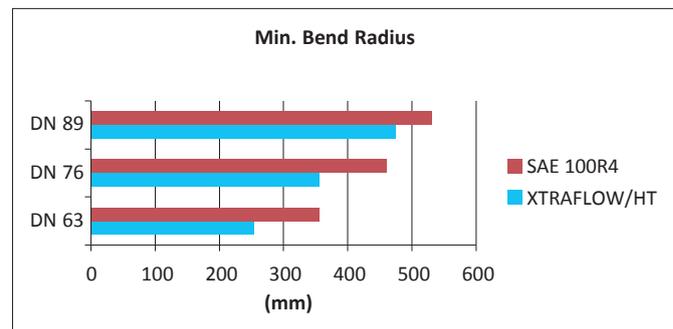
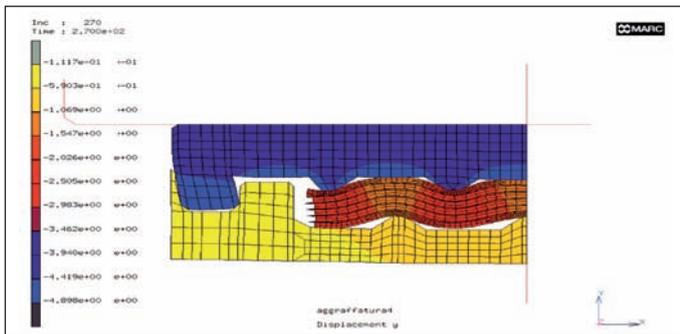


XXL HOSES & CONNECTORS

KEY FEATURES

Hoses

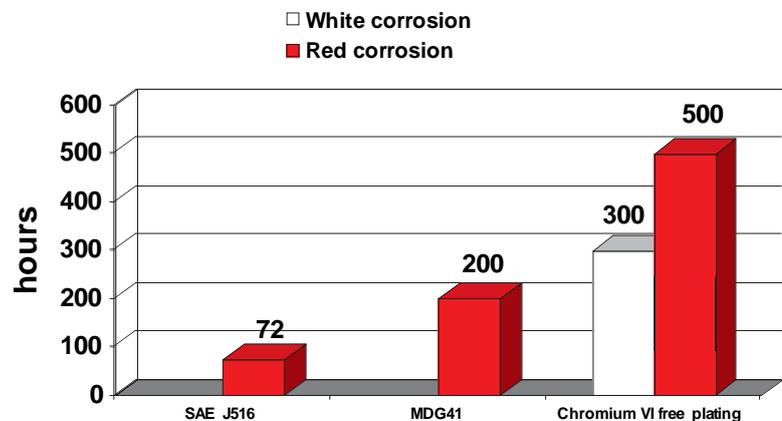
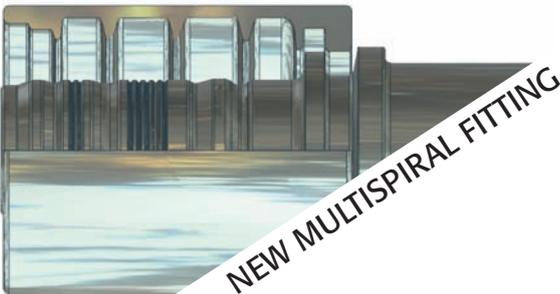
- Suitability for high flow rates
- Low Bend Radii for restricted space installations
- High hose flexibility, easy routing
- No-skive fittings for easy hose assembling (Xtraflow)
- Robust InterLock fitting technology for high pressure lines (Diamondspir)
- **High temperature resistance** for long life mission profiles (**HT style**)
- High robustness of the hose structure for special applications and tough handling
- Special compound designed for long life resistance



Fittings



- **MULTISPIRAL** no-skive fitting solution for large bore and heavy duty hoses as well, for easy maintenance activities and distribution market.
- **INTERLOCK** solution is extreme robust and satisfy the request of safety and reliability for high pressure large bore applications.
- High corrosion resistance of the standard zinc plating chromium-VI-free treatment (ECOAT).
- Special zinc-nickel plating is available upon request for high demanding performance.
- Stainless steel versions available as special solutions upon request.



(ECOAT) Corrosion resistance according to ASTM B117 (ISO 9227) method

XXL HOSES & CONNECTORS

KEY FEATURES

Wide choice of termination ends

HOSES 	INSERT DESIGN 	FAMILY	DESCRIPTION	SIZE 	TERMINATION ENDS PERFORMANCES			
					bar			
					WORKING PRESSURE		MINIMUM BURST	
					MPa	PSI	MPa	PSI
XTRAFLOW/HT	MF	M23311	ISO/SAE CODE 61 FLANGES	40-40	16	2320	64	9280
				48-48				
				56-56				
		M18110	MALE GROOVED CONNECTION	40-40	7	1015	28	4060
				48-48				
		M15910	LOW PRESSURE FLUSH-FIT MALE	40-40	14	2030	56	8120
				48-48				
				56-56				
		M25910...FK	LOW PRESSURE FLUSH-FIT FEMALE	40-40	10,5	1522,5	42	6090
				48-48				
				56-56				
		MR23311...FK MR23311...FK MR23311...FK	ROTOFIT	40-40	14	2030	56	8120
XTRAFLOW/2WB XTRAFLOW/4WS	MS	M83311	ISO/SAE CODE 61 FLANGES	40-40	16	2320	64	9280
				48-48				
				56-56				
		M75910	LOW PRESSURE FLUSH-FIT MALE	40-40	14	2030	56	8120
				48-48				
				56-56				
		M85910	LOW PRESSURE FLUSH-FIT FEMALE	40-40	10,5	1522,5	42	6090
				48-48				
				56-56				
		MR83311 MR83341 MR83391	ROTOFIT	40-40	14	2030	56	8120
DIAMONDSPIR/14 DIAMONDSPIR/21 DIAMONDSPIR/35	IP	M43610	ISO/SAE CODE 62 FLANGES	40-40	42	6090	168	24360
				48-48				
		M48510	XTRAFRANGE 62	40-40	35	5075	140	20300
		M33410	API MALE	40-40	35	5075	140	20300
				48-48				
				48-64				
		M33510	NPT MALE	40-40	35	5075	140	20300
				48-48				
		M36110	HIGH PRESSURE FLUSH-FIT MALE	40-40	35	5075	140	20300
				48-48				
		M46110	HIGH PRESSURE FLUSH-FIT FEMALE	40-40	35	5075	140	20300
				48-48				
DIAMONDSPIR/35	IS	MB3610	ISO/SAE CODE 62 FLANGES	48-48	42	6090	168	24360
		MA3410	API MALE	40-40	35	5075	140	20300
				48-64				
		MA3510	NPT MALE	48-48	35	5075	140	20300
		MA6110	HIGH PRESSURE FLUSH-FIT MALE	48-48	35	5075	140	20300
MB6110	HIGH PRESSURE FLUSH-FIT FEMALE	48-48						

LARGE BORE CHOICE FOR HIGH FLOW RATES

XXL HOSES & CONNECTORS

KEY FEATURES

ROTOFIT

FAMILY			MPa		↻	⌚	T°		★	
			WORKING PRESSURE (Dynamic)		ROTATION per MINUTE	MAX. ROTATION ANGLE	WORKING TEMPERATURE (std. seals)		MINIMUM BURST PRESSURE	
mm	inch	Dash	MPa	PSI	RPM	(*)	°C	°F	MPa	PSI
63	2-1/2"	40	14	2030	15	40	-30 +110	-22 +230	56	8120

- DIRECT to HOSE concept: less sealing surfaces lead to oil leakage risk reduction
- DIRECT to PORT concept: avoids the use of adapters, allow the direct connection on port.



Reduction of possible leakage points ■ Reduction of assembly cost ■ Risk reduction of assembly operation mistakes ■ Full flow design minimizes pressure drop for optimum system performance ■ Cr3 surface coating for maximum corrosion resistance ■ High performances material with hardened areas in the most stressed points to increase service live ■ High bearing number to guarantee a low rotation effort in all pressure conditions and reduce concentrated load ■ Rotation system totally sealed to avoid dirty inclusion

MATERIAL

- High resistance steel, with mandened areas.
- Sealing system O-Ring NBR with PTFE back-up

SAFETY FACTOR

1:4

TEST SPECIFICATION

ISO 6802, ISO 6803



XXL HOSES & CONNECTORS

MAIN APPLICATIONS



MARINE and OFFSHORE installations



Large CONSTRUCTION equipment



INDUSTRIAL hydraulic machines



MINING: underground and open pit mines



OIL RIGS installations

XXL HOSES & CONNECTORS

CASE HISTORIES

Low pressure

XTRAFLOW/HT is successfully applied on drive transmission in giant haul trucks. These machines work in main open pit mines, (North America)



Haulage Units



Xtraflow/HT with Rotofit fittings



Xtraflow/HT hose assemblies

High pressure

DIAMONDSPIR DN 63 is successfully applied on the pressure line of the Backacter 1100, a marine dipperdredger excavator, operating in the Panama Channel



TECHNICAL DATA SHEETS

HOSES & CONNECTORS

- HOSES
 - XTRAFLOW/HT
 - XTRAFLOW/2WB
 - XTRAFLOW/4WS
 - DIAMONDSPIR/14
 - DIAMONDSPIR/21
 - DIAMONDSPIR/35
- FITTINGS
 - XXL LINE - MULTIFIT TYPE
 - XXL LINE - MULTISPIRAL TYPE
 - XXL LINE - INTERLOCK PLUS TYPE
 - XXL LINE - INTERLOCK SUPER TYPE
- FLANGE ASSEMBLING INSTRUCTION

LARGE BORE CHOICE FOR HIGH FLOW RATES

XTRAFLOW/HT

HIGH TEMPERATURE SUCTION & RETURN LINES



PART. REF.	HOSE SIZE			R.O.D.		O.D.		MAX W.P.		BURST PRESSURE		MIN. BEND RADIUS		WEIGHT		FITTING

	DN	dash	inch	mm	inch	mm	inch	bar	psi	bar	psi	mm	inch	g/m	lb/ft	
H01128063*	63	-40	2.1/2"	75,8	2,98	78,5	3,09	35	500	140	2030	254	10,00	3590	2,41	MF+M03400-40
H01128076*	76	-48	3"	87,8	3,46	90,5	3,56	35	500	140	2030	355	13,98	3290	2,21	MF+M03400-48
H01128089*	89	-56	3.1/2"	102,2	4,02	107,4	4,23	35	500	140	2030	475	18,70	5708	3,84	MF+M03400-56



Vacuum resistance exceeding SAE 100R4 performance ■ Extreme high temperature and heat aging resistance ■ High flow rates
 ■ Reduced bend radius compared to SAE 100 R4

MAIN APPLICATIONS

Suction and return lines in hydraulic systems with high temperature fluids, low pressure hydraulic systems in mining equipment. Remark: compressed air applications require cover pin-pricking and additional safety devices.

CONTINUOUS SERVICE TEMPERATURE RANGE

-67°F / +275°F -55°C / +135°C

MAX OPERATING TEMPERATURE

+300°F +150°C

RECOMMENDED FLUIDS

Mineral oils, glycols and polyglycols, transmission fluids, mineral oils in aqueous emulsion (up to 212°F 100°C), air with oil vapours.

TUBE: Oil resistant synthetic rubber

REINFORCEMENT: Two wire braids of high tensile steel wire

COVER: Synthetic rubber with high ozone, weather and heat resistance

APPLICABLE SPECS.: Manuli design

TYPE APPROVALS: MSHA

STANDARD PACKAGING: Reels

XTRAFLOW/2WB

HIGH FLOW RATES, LOW PRESSURE DROPS



PART. REF.	HOSE SIZE			R.O.D.		O.D.		MAX W.P.		BURST PRESSURE		MIN. BEND RADIUS		WEIGHT		FITTING

	DN	dash	inch	mm	inch	mm	inch	bar	psi	bar	psi	mm	inch	g/m	lb/ft	
H01129063*	63	-40	2.1/2"	75,8	2,98	78,5	3,09	105	1520	420	6090	510	20,08	3531	2,37	MS+M05400-40
H01129076*	76	-48	3"	89,0	3,50	93,6	3,69	80	1160	320	4640	510	20,08	4976	3,34	MS+M05400-48
H01129089*	89	-56	3.1/2"	102,2	4,02	107,4	4,23	35	500	140	2030	710	27,95	5530	3,72	MS+M05400-56



Superior abrasion resistance ■ High ozone and weather resistance ■ Flame resistance and electrical antistatic properties of the cover
 ■ High working pressure and flow rates ■ Low pressure drops ■ Vacuum resistance with SAE 100 R4 performance

MAIN APPLICATIONS

Medium-Low pressure lines with high flow rates, specific installations with severe abrasion conditions, marine applications, underground and open pit mining, return and suction lines

CONTINUOUS SERVICE TEMPERATURE RANGE

-40°F / +212°F -40°C / +100°C

RECOMMENDED FLUIDS

Mineral oils, vegetable and rape seed oils, glycol and polyglycol based oils, synthetic ester based oils, oils in aqueous emulsion, water

TUBE: Oil resistant synthetic rubber

REINFORCEMENT: Two high tensile steel wire braids

COVER: Synthetic rubber with high ozone, weather and abrasion resistance

APPLICABLE SPECS.: Extension EN 857-2SC, ISO 11237-2SC

TYPE APPROVALS: MSHA

STANDARD PACKAGING: Reel

XTRAFLOW/4WS

HIGH FLOW RATES, OUTSTANDING ABRASION RESISTANCE



PART. REF.	HOSE SIZE	R.O.D.	O.D.	MAX W.P.	BURST PRESSURE	MIN. BEND RADIUS	WEIGHT	FITTING

	DN	dash	inch	mm	inch	mm	inch	bar	psi	bar	psi	mm	inch	g/m	lb/ft	
H10091063*	63	-40	2.1/2"	77,5	3,05	81,5	3,21	140	2030	700	10150	700	27,56	5890	3,96	MS+M05400-40
H10091076*	76	-48	3"	87,8	3,46	92,2	3,63	105	1520	525	7610	700	27,56	5900	3,96	MS+M05400-48
H10091089*	89	-56	3.1/2"	103,7	4,08	108,7	4,28	80	1160	400	5800	800	31,50	8212	5,52	MS+M05400-56



Extreme abrasion resistance ■ High ozone and weather resistance ■ Flame retardant and antistatic cover ■ Superior pressure rating
 ■ Structure robustness for tough handling

MAIN APPLICATIONS

Mine hydraulic return lines, medium pressure hydraulic lines with high flow rates, longwalls water lines

CONTINUOUS SERVICE TEMPERATURE RANGE

-40°F / +212°F -40°C / +100°C

RECOMMENDED FLUIDS

Mineral oils, vegetable oils, and synthetic ester based oils, glycols and polyglycols, mineral oils in aqueous emulsion, water

TUBE: Oil resistant synthetic rubber

REINFORCEMENT: Four high tensile steel wire spirals

COVER: Synthetic rubber with high abrasion, ozone and weather resistance

APPLICABLE SPECS.: Manuli Design

TYPE APPROVALS: GOST-R; MSHA

STANDARD PACKAGING: Reel

DIAMONDSPIR/14

HIGH FLOW RATES, OUTSTANDING ABRASION RESISTANCE



PART. REF.	HOSE SIZE	R.O.D.	O.D.	MAX W.P.	BURST PRESSURE	MIN. BEND RADIUS	WEIGHT	FITTING

	DN	dash	inch	mm	inch	mm	inch	bar	psi	bar	psi	mm	inch	g/m	lb/ft	
H10104076*	76	-48	3"	87,8	3,46	92,2	3,63	140	2030	560	8120	700	27,56	5900	3,96	IP+M01500-48



Extreme abrasion resistance ■ High ozone and weather resistance ■ Flame retardant and antistatic cover ■ Superior pressure rating
 ■ Structure robustness for tough handling ■ InterLock robust fitting technology

MAIN APPLICATIONS

Mine hydraulic return lines, medium pressure hydraulic lines with high flow rates, longwalls water lines

CONTINUOUS SERVICE TEMPERATURE RANGE

-40°F / +250°F -40°C / +121°C

MAX OPERATING TEMPERATURE

+257°F +125°C

RECOMMENDED FLUIDS

Mineral oils, vegetable oils, and synthetic ester based oils, glycols and polyglycols, mineral oils in aqueous emulsion, water

TUBE: Oil resistant synthetic rubber

REINFORCEMENT: Four or six high tensile wire spirals

COVER: Synthetic rubber with high abrasion, ozone and weather resistance

APPLICABLE SPECS.: Manuli Design, ISO 18752-C extension

TYPE APPROVALS: FRAS, GOST-R, MSHA

LARGE BORE CHOICE FOR HIGH FLOW RATES

DIAMONDSPIR/21

VERY HIGH HYDRAULIC POWER TRANSMISSION



PART. REF.	HOSE SIZE	R.O.D.	O.D.	MAX W.P.	BURST PRESSURE	MIN. BEND RADIUS	WEIGHT	FITTING

	DN	dash	inch	mm	inch	mm	inch	bar	psi	bar	psi	mm	inch	g/m	lb/ft	
H10102063*	63	-40	2.1/2"	77,5	3,05	81,5	3,21	210	3040	840	12180	700	27,56	5890	3,96	IP+M01500-40
H10102076*	76	-48	3"	90,8	3,57	94,6	3,72	210	3040	840	12180	900	35,43	7910	5,32	IP+M01810-48



Very high flow rates in high pressure ■ Extreme robustness of the hose structures ■ Hose compact dimensions ■ Approved with severe fatigue tests ■ Superior abrasion resistance ■ High ozone and weather resistance ■ Flame retardant (MSHA) and antistatic properties ■ Biological and mineral oils compatibility ■ Crimped InterLock Plus fittings structures

MAIN APPLICATIONS

Heavy duty power lines, hydrostatic transmissions in heavy duty environmental conditions, specific installations with severe abrasion conditions, offshore applications, underground and open pit mining

CONTINUOUS SERVICE TEMPERATURE RANGE

-40°F / +250°F -40°C / +121°C

MAX OPERATING TEMPERATURE

+257°F +125°C

RECOMMENDED FLUIDS

Mineral oils, vegetable oils and synthetic ester based oils (up to 100°C/212°F), glycols and polyglycols, mineral oils in aqueous emulsion, water

TUBE: Oil resistant synthetic rubber

REINFORCEMENT: Four to six high tensile steel spirals

COVER: Synthetic rubber with high abrasion, ozone, weather and heat resistance

APPLICABLE SPECS.: MANULI® Design: ISO 18752 grade C extension

TYPE APPROVALS: FRAS; GOST-R; MSHA

STANDARD PACKAGING: Reel

DIAMONDSPIR/35

VERY HIGH HYDRAULIC POWER TRANSMISSION



PART. REF.	HOSE SIZE	R.O.D.	O.D.	MAX W.P.	BURST PRESSURE	MIN. BEND RADIUS	WEIGHT	FITTING

	DN	dash	inch	mm	inch	mm	inch	bar	psi	bar	psi	mm	inch	g/m	lb/ft	
H10103063*	63	-40	2.1/2"	80,6	3,17	84,8	3,34	350	5070	1400	20300	800	31,50	8110	5,45	IP+M01810-40
H10103076*	76	-48	3"	97,9	3,85	101,9	4,01	350	5070	1400	20300	1000	39,37	12070	8,11	IS+M02800-48



Very high flow rates in high pressure ■ Extreme robustness of the hose structures ■ Hose compact dimensions ■ Approved with severe fatigue tests ■ Superior abrasion resistance ■ High ozone and weather resistance ■ Flame retardant (MSHA) and antistatic properties ■ Biological and mineral oils compatibility ■ Crimped InterLock Plus & Interlock Super fittings structures

MAIN APPLICATIONS

Heavy duty power lines, hydrostatic transmissions in heavy duty environmental conditions, specific installations with severe abrasion conditions, offshore applications, underground and open pit mining.

CONTINUOUS SERVICE TEMPERATURE RANGE

-40°F / +250°F -40°C / +121°C

MAX OPERATING TEMPERATURE

+257°F +125°C

RECOMMENDED FLUIDS

Mineral oils, vegetable oils and synthetic ester based oils (up to 100°C/212°F), glycols and polyglycols, mineral oils in aqueous emulsion, water

TUBE: Oil resistant synthetic rubber

REINFORCEMENT: Six to eight high tensile steel spirals

COVER: Synthetic rubber with high abrasion, ozone, weather and heat resistance

APPLICABLE SPECS.: MANULI® Design: ISO 18752 grade C extension

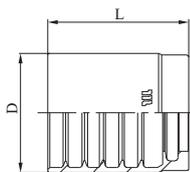
TYPE APPROVALS: FRAS; GOST-R; MSHA

STANDARD PACKAGING: Reel

XXL LINE - MULTIFIT TYPE

M03400

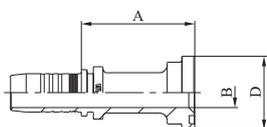
NO-SKIVE FERRULE FOR WIRE BRAID HOSES



PART. REF.	HOSE BORE			DIMENSIONS mm					
	DN	inch	Size		D	L			
M03400-40	63	2.1/2"	- 40		88,2	68,8			
M03400-48	76	3"	- 48		103,0	75,0			
M03400-56	89	3.1/2"	- 56		123,4	91,0			

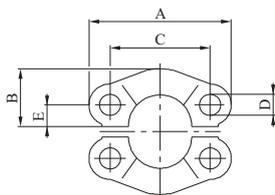
M23311

ISO/SAE CODE 61 FLANGE SAE J516/ISO 12151-3



PART. REF.	HOSE BORE			FLANGE	DIMENSIONS mm				
	DN	inch	Size		B	A	D		
M23311-40-40	63	2.1/2"	- 40	2.1/2"	56,0	84,0	84,3		
M23311-48-48	76	3"	- 48	3"	69,0	86,0	101,6		
M23311-56-56	89	3.1/2"	- 56	3.1/2"	79,0	94,5	114,3		

for Xtraflow/HT application, Viton O-Ring seals are strongly recommended



O83308

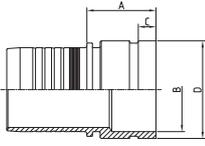
ISO/SAE CODE 61 SPLIT FLANGE CLAMPS SAE J518/ISO 6162-1

PART. REF.	HOSE BORE			DIMENSIONS mm					
	DN	inch	Size	B	A	C	D	E	
O83308-40	63	2.1/2"	- 40	54,4	114,3	88,9	13,5	25,4	
O83308-48	76	3"	- 48	65,3	135	106,4	16,5	30,9	
O83308-56	89	3.1/2"	- 56	70,0	152	120,7	17,0	34,9	

XXL LINE - MULTIFIT TYPE

M18110

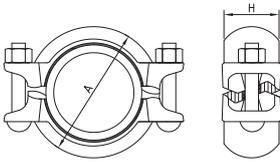
MALE GROOVED



PART. REF.	HOSE BORE			DIMENSIONS mm					
	DN	inch	Size	B	A	C	D		
M18110-40-40	63	2.1/2"	- 40	61,0	59,0	16,0	73,0		
M18110-48-48	76	3"	- 48	76,5	62,5	16,0	88,9		

O88107

CLAMP FOR MALE GROOVED

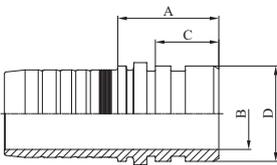


PART. REF.	HOSE BORE			DIMENSIONS mm					
	DN	inch	Size	A *	H				
O88107-40	63	2.1/2"	- 40	111,0	52,0				
O88107-48	76	3"	- 48	127,0	52,0				

* dimension before installation

M15910

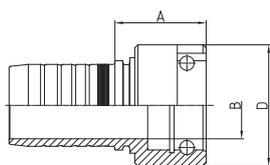
LOW PRESSURE FLUSHFIT MALE



PART. REF.	HOSE BORE			DIMENSIONS mm					
	DN	inch	Size	B	A	C	D		
M15910-40-40	63	2.1/2"	- 40	60,0	79,0	51,0	76		
M15910-48-48	76	3"	- 48	62,5	95,0	73,0	79		
M15910-56-56	89	3.1/2"	- 56	76,0	114,0	85,5	86		

Beater Flange version available

XXL LINE - MULTIFIT TYPE



M25910...FK

LOW PRESSURE FLUSHFIT FEMALE

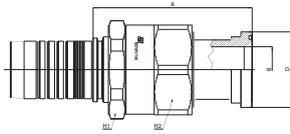
PART. REF.	HOSE BORE			DIMENSIONS mm						
	DN	inch	Size		B	A	D			
M25910-40-40FK	63	2.1/2"	- 40		55,4	72,0	106			
M25910-48-48FK	76	3"	- 48		67,5	98,0	110			
M25910-56-56FK	89	3.1/2"	- 56		79,0	109,0	132			

LARGE BORE CHOICE FOR HIGH FLOW RATES

ROTOFIT - MULTIFIT TYPE

MR23311

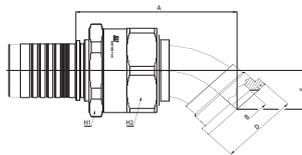
ISO/SAE CODE 61 FLANGE SAE J516/ISO 12151-3



PART. REF.	HOSE BORE			THREAD	DIMENSIONS mm					
	DN	inch	Size		T	A	B	D	H ¹	H ²
MR23311-40-40FK	63	2.1/2"	- 40	2-1/2"	137	52	84,3	100	100	

MR23341

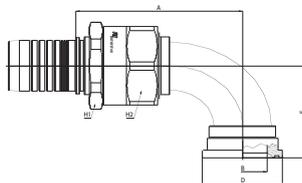
45° ISO/SAE CODE 61 FLANGE SAE J516/ISO 12151-3



PART. REF.	HOSE BORE			THREAD	DIMENSIONS mm					
	DN	inch	Size		T	A	B	D	E	H ¹
MR23341-40-40FK	63	2.1/2"	- 40	2-1/2"	170	52	84,3	46	100	100

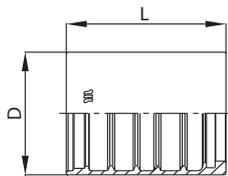
MR23391

90° ISO/SAE CODE 61 FLANGE SAE J516/ISO 12151-3



PART. REF.	HOSE BORE			THREAD	DIMENSIONS mm					
	DN	inch	Size		T	A	B	D	E	H ¹
MR23391-40-40FK	63	2.1/2"	- 40	2-1/2"	175	52	84,3	118	100	100

XXL LINE - MULTISPIRAL TYPE



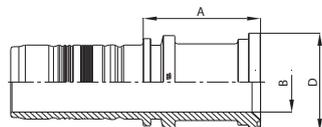
M05400

NO-SKYVE FERRULE FOR 4WS - 2WB HOSES

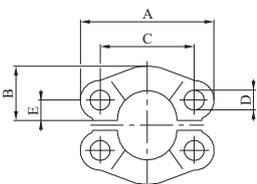
PART. REF.	HOSE BORE			DIMENSIONS mm					
	DN	inch	Size		D	L			
M05400-40	63	2.1/2"	- 40		97,0	116,0			
M05400-48	76	3"	- 48		109,8	124,0			
M05400-56	89	3.1/2"	- 56		127,7	123,5			

M83311

ISO/SAE CODE 61 FLANGE - SAE J516/ISO 12151-3



PART. REF.	HOSE BORE			FLANGE	DIMENSIONS mm				
	DN	inch	Size		B	A	D		
M83311-40-40	63	2.1/2"	- 40	2.1/2"	51,5	93,0	84,3		
M83311-48-48	76	3"	- 48	3"	62,5	88,5	101,6		
M83311-56-56	89	3.1/2"	- 56	3.1/2"	76,0	98,5	114,3		



O83308

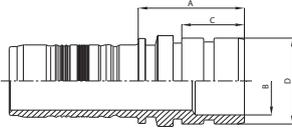
ISO/SAE CODE 61 SPLIT FLANGE CLAMPS SAE J518/ISO 6162-1

PART. REF.	HOSE BORE			DIMENSIONS mm					
	DN	inch	Size	B	A	C	D	E	
O83308-40	63	2.1/2"	- 40	54,4	114,3	88,9	13,5	25,4	
O83308-48	76	3"	- 48	65,3	135	106,4	16,5	30,9	
O83308-56	89	3.1/2"	- 56	70,0	152	120,7	17,0	34,9	

XXL LINE - MULTISPIRAL TYPE

M75910

LOW PRESSURE FLUSHFIT MALE



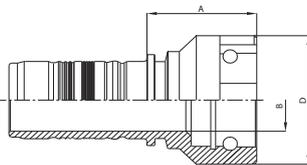
PART. REF.	HOSE BORE			DIMENSIONS mm					
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	DN	inch	Size		B	A	C	D		
M75910-40-40	63	2.1/2"	- 40		51,5	85,0	51,0	76		
M75910-48-48	76	3"	- 48		62,5	97,0	73,0	79		
M75910-56-56	89	3.1/2"	- 56		76,0	117,0	85,5	86		

Beater Flange version available

M85910

LOW PRESSURE FLUSHFIT FEMALE



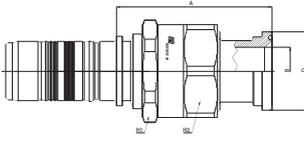
PART. REF.	HOSE BORE			DIMENSIONS mm					
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	DN	inch	Size		B	A	D			
M85910-40-40	63	2.1/2"	- 40		51,5	78,0	106			
M85910-48-48	76	3"	- 48		62,5	100,0	110			
M85910-56-56	89	3.1/2"	- 56		76,0	112,0	132			

ROTOFIT - MULTISPIRAL TYPE

MR83310

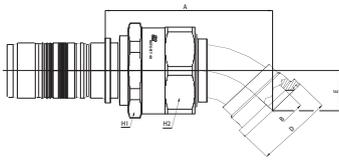
SAE STANDARD CONNECTIONS



PART. REF.	HOSE BORE			THREAD	DIMENSIONS mm					
	DN	inch	Size		T	A	B	D	H ¹	H ²
MR83310-40-40	63	2.1/2"	- 40	2-1/2"	150	52	84,3	100	100	

MR83340

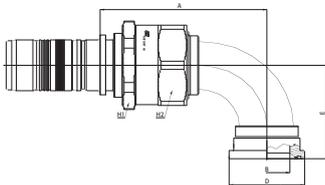
45° ISO/SAE CODE 61 FLANGE SAE J516/ISO 12151-3



PART. REF.	HOSE BORE			THREAD	DIMENSIONS mm					
	DN	inch	Size		T	A	B	D	E	H ¹
MR83340-40-40	63	2.1/2"	- 40	2-1/2"	180	52	84,3	46	100	100

MR83390

90° ISO/SAE CODE 61 FLANGE SAE J516/ISO 12151-3

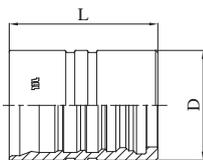


PART. REF.	HOSE BORE			THREAD	DIMENSIONS mm					
	DN	inch	Size		T	A	B	D	E	H ¹
MR83390-40-40	63	2.1/2"	- 40	2-1/2"	185	52	84,3	118	100	100

XXL LINE - INTERLOCK PLUS TYPE

M01500

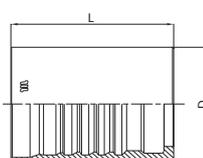
DOUBLE SKIVE FERRULE FOR HEAVY DUTY SPIRAL HOSES (4 PLY)



PART. REF.	HOSE BORE			DIMENSIONS mm					
	DN	inch	Size		D	L			
M01500-40	63	2.1/2"	- 40		100,0	135,0			
M01500-48	76	3"	- 48		107,0	125,0			

M01810

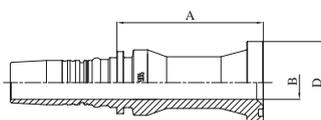
DOUBLE SKIVE FERRULE FOR EXTRA DUTY SPIRAL HOSES (6 PLY)



PART. REF.	HOSE BORE			DIMENSIONS mm					
	DN	inch	Size		D	L			
M01810-40	63	2.1/2"	- 40		103,0	135,0			
M01810-48	76	3"	- 48		113,5	125,0			

M43610

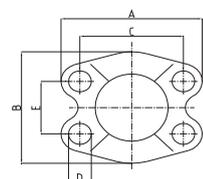
ISO/SAE CODE 62 FLANGE - SAE J516/ISO 12151-3



PART. REF.	HOSE BORE			FLANGE	DIMENSIONS mm				
	DN	inch	Size		B	A	D		
M43610-40-40	63	2.1/2"	- 40	2.1/2"	51,5	127,0	107,8		
M43610-48-48	76	3"	- 48	3"	62,5	167,0	131,9		

O83607

ISO/SAE CODE 62 ONE-PIECE FLANGE CLAMPS - SAE J518/ISO 6162-2

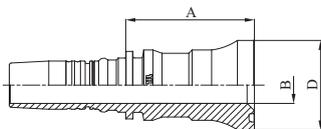


PART. REF.	HOSE BORE			PART. REF.	DIMENSIONS mm				
	DN	inch	Size		B	A	C	D	E
O83607-40	63	2.1/2"	- 40		150,0	175,0	123,8	25,0	58,7
O83607-48	76	3"	- 48		178,0	210,0	152,4	32,0	71,4

XXL LINE - INTERLOCK PLUS TYPE

M48510

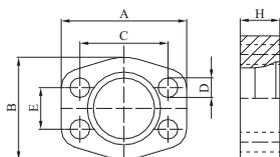
XTRAFLANGE/62 (SAE J518 / ISO 6162-2 PORT COMPATIBLE)



PART. REF.	HOSE BORE			FLANGE	DIMENSIONS mm					
	DN	inch	Size		B	A	D			
M48510-40-40	63	2.1/2"	- 40	2.1/2"	51,5	149,0	99,2			

O88507

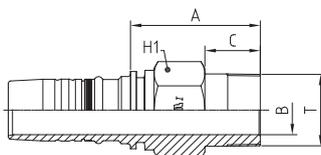
ONE-PIECE XTRAFLANGE/62 CLAMP (SAE J518 / ISO 6162-2 PORT COMPATIBLE)



PART. REF.	HOSE BORE			DIMENSIONS mm					
	DN	inch	Size	B	A	C	D	E	H
O88507-40	63	2.1/2"	- 40	150,0	180,0	123,8	26,0	58,8	55,0

M33410

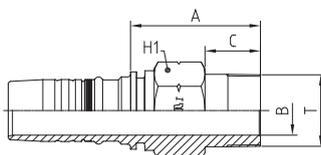
API MALE WITH HEXAGONAL BODY (API 5B THREAD)



PART. REF.	HOSE BORE			THREAD	DIMENSIONS mm					
	DN	inch	Size		B	A	C	H'		
M33410-40-40	63	2.1/2"	- 40	2.1/2"-8	51,5	135,0	63,0	80		
M33410-48-48	76	3"	- 48	3"-8	62,5	143,5	71,5	100		
M33410-48-64	76	3"	- 48	4"-8	62,5	171,5	76,0	120		

M33510

NPT MALE

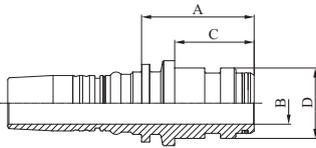


PART. REF.	HOSE BORE			THREAD	DIMENSIONS mm					
	DN	inch	Size		B	A	C	H'		
M33510-40-40	63	2.1/2"	- 40	2.1/2"-8	51,5	135,0	63,0	80		
M33510-48-48	76	3"	- 48	3"-8	62,5	143,5	71,5	100		

XXL LINE - INTERLOCK PLUS TYPE

M36110

HIGH PRESSURE FLUSHFIT MALE

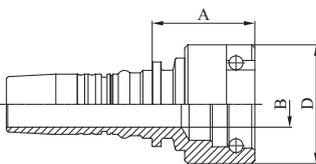


PART. REF.	HOSE BORE			DIMENSIONS mm					
	DN	inch	Size	B	A	C	D		
M36110-40-40	63	2.1/2"	- 40	49,7	112,5	79,0	77,5		
M36110-48-48	76	3"	- 48	62,5	121,0	90,0	95,4		

Beater Flange version available

M46110

HIGH PRESSURE FLUSHFIT FEMALE

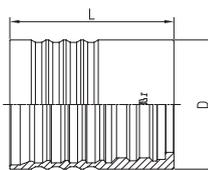


PART. REF.	HOSE BORE			DIMENSIONS mm					
	DN	inch	Size	B	A	D			
M46110-40-40	63	2.1/2"	- 40	51,5	100,0	112			
M46110-48-48	76	3"	- 48	62,5	117,0	140			

XXL LINE - INTERLOCK SUPER TYPE

M02800

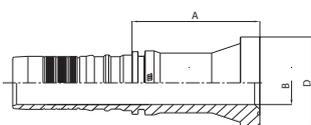
DOUBLE SKIVE FERRULE FOR EXTRA DUTY SPIRAL HOSES (8 PLY)



PART. REF.	HOSE BORE			DIMENSIONS mm					
	DN	inch	Size	D	L				
M02800-48	76	3"	- 48	122,0	165,0				

MB3610

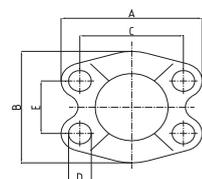
ISO/SAE CODE 62 FLANGE - SAE J516/ISO 12151-3



PART. REF.	HOSE BORE			FLANGE	DIMENSIONS mm				
	DN	inch	Size		B	A	D		
MB3610-48-48	76	3"	- 48	3"	62,5	169,0	131,9		

O83607

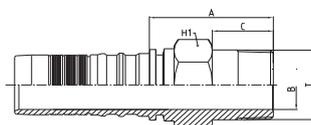
ISO/SAE CODE 62 ONE-PIECE FLANGE CLAMPS - SAE J518/ISO 6162-2



PART. REF.	HOSE BORE			DIMENSIONS mm					
	DN	inch	Size	B	A	C	D	E	
O83607-48	76	3"	- 48	178,0	210,0	152,4	32,0	71,4	

MA3410

API MALE WITH HEXAGONAL BODY (API 5B THREAD)

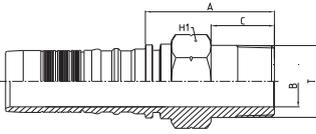


PART. REF.	HOSE BORE			FLANGE	DIMENSIONS mm				
	DN	inch	Size		B	A	C	H'	
MA3410-48-48	76	3"	- 48	3"-8	62,5	145,5	71,5	100	
MA3410-48-64	76	3"	- 48	4"-8	62,5	173,5	76,0	120	

XXL LINE - INTERLOCK SUPER TYPE

MA3510

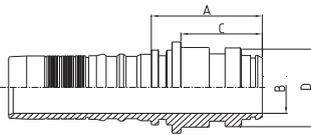
NPT MALE



PART. REF.	HOSE BORE			THREAD	DIMENSIONS mm					
	DN	inch	Size		B	A	C	H ¹		
MA3510-48-48	76	3"	- 48	3"-8	62,5	145,5	71,5	100		

MA6110

HIGH PRESSURE FLUSHFIT MALE

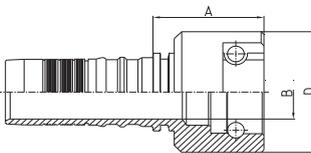


PART. REF.	HOSE BORE			THREAD	DIMENSIONS mm					
	DN	inch	Size		B	A	C	D		
MA6110-48-48	76	3"	- 48		62,5	123,0	90,0	95,4		

Beater Flange version available

MB6110

HIGH PRESSURE FLUSHFIT FEMALE

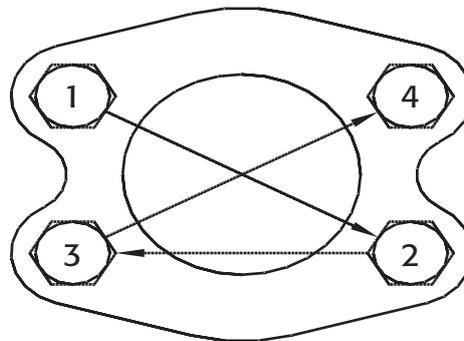


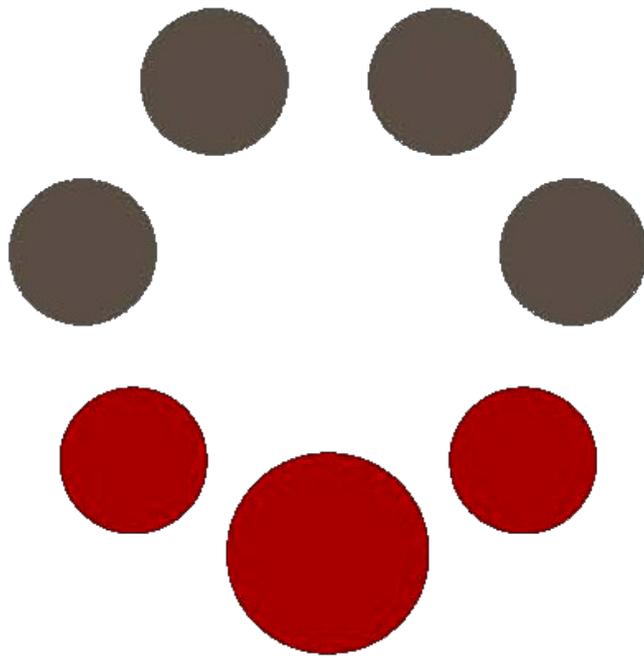
PART. REF.	HOSE BORE			THREAD	DIMENSIONS mm					
	DN	inch	Size		B	A	D			
MB6110-48-48	76	3"	- 48		62,5	119,0	140			

FLANGE ASSEMBLING INSTRUCTIONS

PART NUMBER	FLANGE SIZE	FLANGE CLAMP	O-RING (NBR 90 ShA) *	METRIC BOLT DIMENSIONS class 10.9	UNC BOLT DIMENSIONS grade 8	BOLT LENGHT (mm)	BOLT TORQUE (mm)
M23311-40-40	2.1/2"	O83308-40	69,44x3,53	M12	1/2"-13	40	130
M23311-48-48	3"	O83308-48	85,32x3,53	M16	5/8"-11	50	295
M23311-56-56	3.1/2"	O83308-56	98,05x3,53	M16	5/8"-11	50	295
M83311-40-40	2.1/2"	O83308-40	69,44x3,53	M12	1/2"-13	40	130
M83311-48-48	3"	O83308-48	85,32x3,53	M16	5/8"-11	50	295
M83311-56-56	3.1/2"	O83308-56	69,44x3,53	M16	5/8"-11	50	295
M43610-40-40	2.1/2"	O83607-40	69,44x3,53	M24	1"-8	80	550
M43610-48-48	3"	O83607-48	85,32x3,53	M30	1.1/4"-7	90	650
M48510-40-40	2.1/2"	O88507-40	69,44x3,53	M24	1"-8	110	550
MB3610-48-48	3"	O88607-48	85,32x3,53	M30	1.1/4"-7	90	650

* for Xtraflow/HT application, Viton O-Ring seals are strongly recommended







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LARGE BORE CHOICE FOR HIGH FLOW RATES