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Lynch Manifolds & Valve Packs

Material Properties

Bar Manifolds and Accessories are offered in the following standard materials;
6061-T6 Aluminum, 65-45-12 Continuous Cast Ductile Iron and C12L14 free machining steel.

Other materials such as Stainless Steel, Mild Steel, Brass, and Plastic are available upon request.
Below, are the properties of the standard materials:

For its aluminum bodies, a 6000 series aluminum alloy that offers high strength characteristics and good corrosion resistance in the finished product is used. The mechanical properties of grade 6061-T6 aluminum are:

ALUMINUM PROPERTIES PROPERTIES	ASTM B-221 ** Grade 6061-T6
Tensile Strength	45,000 PSI
Yield Strength	40,000 PSI
Elongation, %	12%
Brinell Hardness Range	95
ASTM Specification	B-221

**Above material is rated at 3000 psi max, depending on duty cycle and design parameters.

We use a ductile iron that offers high tensile strength and good ductlity for its iron bodies. All ductile iron bodies use iron produced by the continuous cast method which provides a body that possesses a dense, homogeneous structure with minimal inclusions for high pressure integrity. The mechanical properties of grade 65-45-12 ductile iron are:

DUCTILE IRON PROPERTIES	ASTM A-536 ** Grade 65-45-12
Tensile Strength	65,000 PSI
Yield Strength	45,000 PSI
Elongation, %	12%
Brinell Hardness Range	131/220
ASTM Specification	A-536

**Above material is rated at 5000 psi max, depending on duty cycle and design parameters.

Where applicable, a free machining grade of steel is used on select bodies. The mechanical properties of this material are equal to or greater than ductile iron. The mechanical properties of grade C12L14 are:

FREE MACHINING STEEL PROPERTIES	ASTM A-108 ** Grade C12L14
Tensile Strength	78,000 PSI
Yield Strength	70,000 PSI
Elongation, %	15%
Brinell Hardness Range	163
ASTM Specification	A-108

**Above material is rated at 5000 psi max, depending on duty cycle and design parameters.

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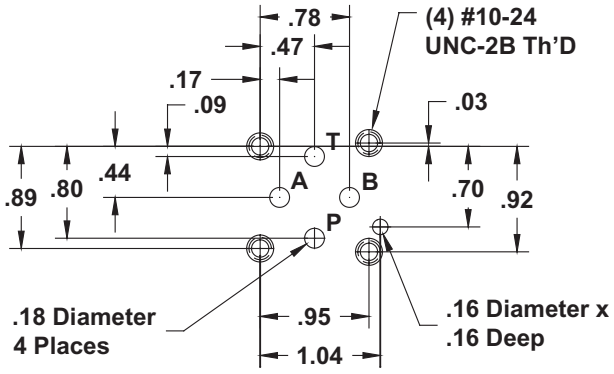
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Solenoid Valve Interfaces

ISO 02 / NFPA D02

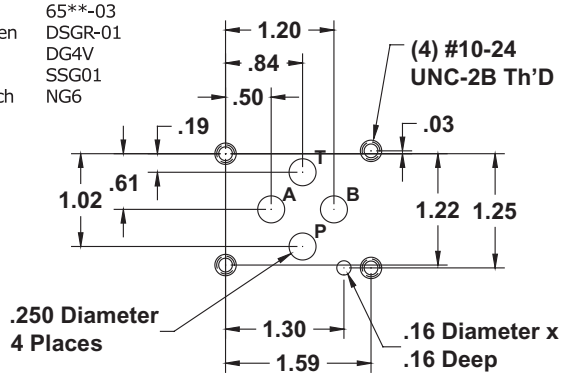
Valve Models
Wandfluh WD



ISO 03 / NFPA D03

Valve Models

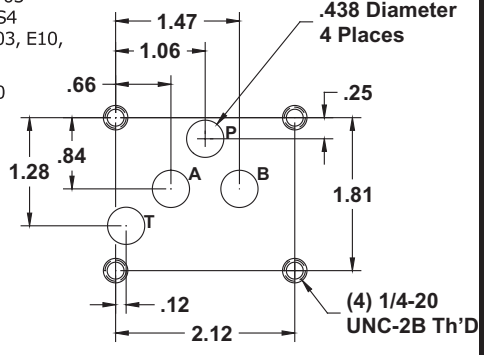
Continental	VS5M, ED03M
Delta	Series 4000
Denison	A-3D01, D2D02-35
Double A	Q* - 3
Parker Hannifin	D1VW
Racine	.25"
Rexroth	WE6, 4WRA6
Rivett	65**-03
Rucker/Yuken	DSGR-01
Vickers	DG4V
Nachi	SSG01
Racine-Bosch	NG6



ISO 05 / NFPA D05

Valve Models

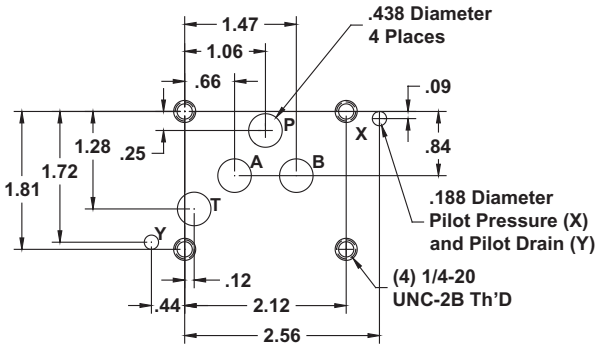
Continental	VS12M, ED05M
Denison	DID04, 3D02, A-D2D04
Double A	Q* - 5
Parker Hannifin	D3W
Racine	.25"
Rexroth	WE8, WE10
Rivett	65**-02
Rucker/Yuken	DSG-03
Vickers	DG4S4
Nachi	SSG03, E10, E20
Racine-Bosch	NG10



ISO 05 / D05 with X and Y U.S.

Valve Models

Double A	Q* - 02H
Parker Hannifin	D31VW
Racine	FD4-**HS-*02
Rivett	6600-02H
Racine-Bosch	NG10



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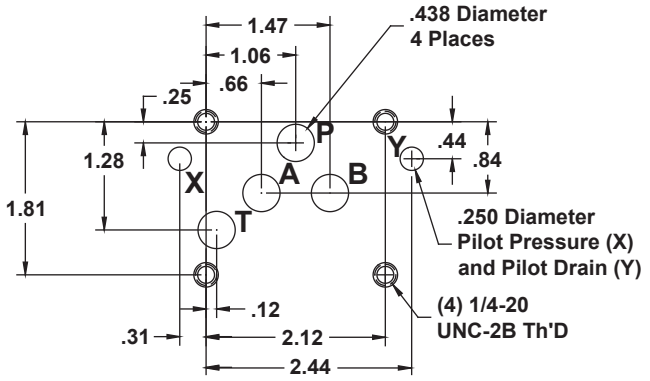
Lynch
Manifolds & Valve Packs

Solenoid Valve Interfaces

ISO 05 / D05 with X and Y European

Valve Models

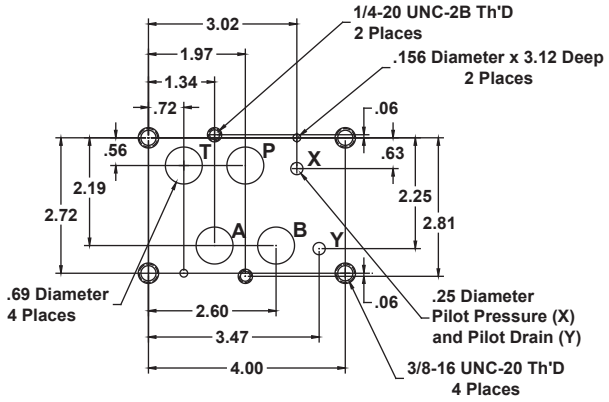
Rexroth	WEH10



ISO 07 / NFPA D07 with X and Y

Valve Models

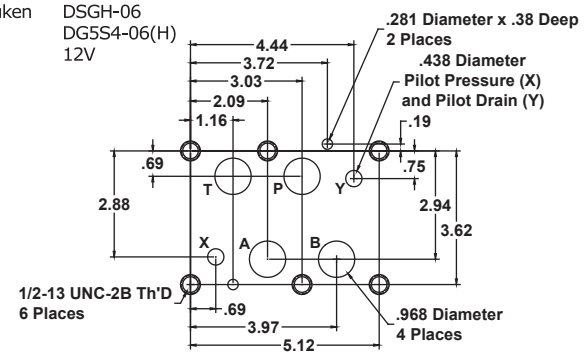
Denison	A-3D03
Rexroth	WEH16
Rucker/Yuken	DSHG-04
Vickers	DG5S4-04



ISO 08 / NFPA D08 with X and Y

Valve Models

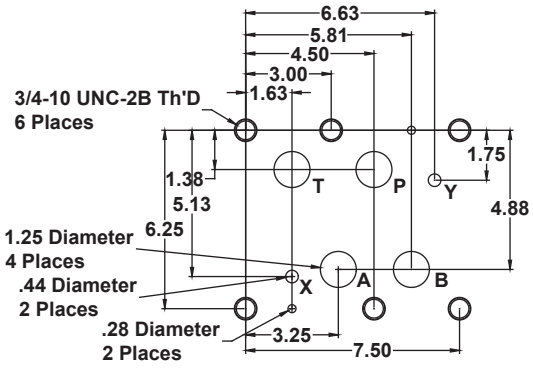
Continental	VS35M, VA35M
	DVS35M
Denison	A-3D06, DID12
Double A	Q* - 06
Parker Hannifin	D61VW, D63W
Racine	FD4-(A or B) *HS-*06
Rexroth	WEH22
Rivett	6600-06
Rucker/Yuken	DSGH-06
Vickers	DG5S4-06(H)
Webster	12V



ISO 10 / NFPA D10 with X and Y

Valve Models

Denison	A-3D10
Parker Hannifin	D10, D101VW
Rexroth	WEH 32
Vickers	DG5S4-10



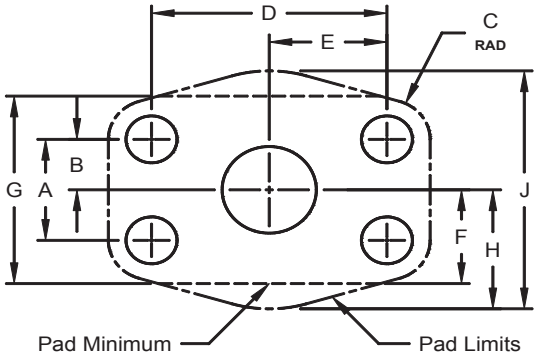
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ISO 6162 (SAE) Flange Pattern Specifications

2.5 to 35 Mpa Series (SAE Code 61)

Nominal Flange Size		Maximum Recommended Working Press.	O-Ring Size	O-Ring O.D.
1/2"	13 mm	5000 psi	210	1.000
3/4"	19 mm	5000 psi	214	1.250
1"	25 mm	5000 psi	219	1.562
1 1/4"	32 mm	3625 psi	222	1.750
1 1/2"	38 mm	2900 psi	225	2.125
2"	51 mm	2900 psi	228	2.500
2 1/2"	64mm	2320 psi	232	3.000
3"	76mm	1450 psi	237	3.625
3 1/2"	89mm	360 psi	241	4.125
4"	102mm	360 psi	245	4.625
5"	127mm	360 psi	253	5.625



40 Mpa Series (SAE Code 62)

Nominal Flange Size		Maximum Recommended Working Press.	O-Ring Size	O-Ring O.D.
1/2"	13 mm	5800 psi	210	1.000
3/4"	19 mm	5800 psi	214	1.250
1"	25 mm	5800 psi	219	1.562
1 1/4"	32 mm	5800 psi	222	1.750
1 1/2"	38 mm	5800 psi	225	2.125
2"	51 mm	5800 psi	228	2.500
2 1/2"(+)	64mm	Contact Mfr	232	3.000
3" (+)	76mm	Contact Mfr	237	3.625

NOTE:
(+) = NOT A RECOMMENDED PORT since this is an Industry Standard not an ISO or SAE Standard

This specification permits operation of the port up to the pressures noted. Some flanges that match these ports may be rated for lower operating pressures or limited by the mating materials.

Please consult the data from the flange manufacturers for specific operational pressures allowed.

2.5 to 34.5 Mpa Series (SAE Code 61)

Four-Bolt Flange Pattern

Nominal Size	A +/-.010	B	C	D +/-.010	E	F	G	H	J +/-.010
0.50	0.688	0.344	0.312	1.500	0.750	0.656	1.312	0.906	1.812
0.75	0.875	0.438	0.344	1.875	0.938	0.813	1.625	1.031	2.062
1.00	1.031	0.516	0.344	2.062	1.031	0.938	1.875	1.156	2.312
1.25	1.188	0.594	0.406	2.312	1.156	1.063	2.125	1.438	2.875
1.50	1.406	0.703	0.469	2.750	1.375	1.250	2.500	1.625	3.250
2.00	1.688	0.844	0.469	3.062	1.531	1.500	3.000	1.906	3.812
2.50	2.000	1.000	0.500	3.500	1.750	1.750	3.500	2.109	4.218
3.00	2.438	1.219	0.562	4.188	2.094	2.094	4.188	2.578	5.156
3.50	2.750	1.375	0.625	4.750	2.375	2.344	4.688	2.750	5.500
4.00	3.062	1.531	0.625	5.125	2.563	2.594	5.188	3.000	6.000
5.00	3.625	1.813	0.625	6.000	3.000	3.094	6.188	3.563	7.125

ISO 6162 Type I - Metric Mounting Dimensions

Nominal Size	Thru Hole Diameter	Mounting Thread	Mtg. Thread Depth (min)*	Counterbore Diameter
0.50	0.344	M 8x1.25-6H	0.938 / (0.492)	0.562
0.75	0.422	M10x1.50-6H	0.875 / (0.650)	0.688
1.00	0.422	M10x1.50-6H	0.875 / (0.571)	0.688
1.25	0.422	M10x1.50-6H	1.125 / (0.650)	0.688
1.50	0.500	M12x1.75-6H	1.062 / (0.768)	0.750
2.00	0.500	M12x1.75-6H	1.062 / (0.768)	0.750
2.50	0.500	M12x1.75-6H	1.188 / (0.846)	0.750
3.00	0.656	M16x2.00-6H	1.188 / (1.122)	1.000
3.50	0.656	M16x2.00-6H	1.312 / (1.122)	1.000
4.00	0.656	M16x2.00-6H	1.188 / (1.004)	1.000
5.00	0.656	M16x2.00-6H	1.312 / (1.083)	1.000

* = Design Depth per SAE J518 / (ISO 6162 Depth)

SAE J518 / ISO 6162 Type II - Inch Mounting Dimensions

Nominal Size	Thru Hole Diameter	Mounting Thread	Mtg. Thread Depth	Counterbore Diameter
0.50	0.344	5/16-18 UNC-2B	0.938	0.500
0.75	0.406	3/8-16 UNC-2B	0.875	0.594
1.00	0.406	3/8-16 UNC-2B	0.875	0.594
1.25	0.469	7/16-14 UNC-2B	1.125	0.688
1.50	0.531	1/2-13 UNC-2B	1.062	0.781
2.00	0.531	1/2-13 UNC-2B	1.062	0.781
2.50	0.531	1/2-13 UNC-2B	1.188	0.781
3.00	0.656	5/8-11 UNC-2B	1.188	0.969
3.50	0.656	5/8-11 UNC-2B	1.312	0.969
4.00	0.656	5/8-11 UNC-2B	1.188	0.969
5.00	0.656	5/8-11 UNC-2B	1.312	0.969

40 Mpa Series (SAE Code 62)

Four-Bolt Flange Pattern

Nominal Size	A +/-.010	B	C	D +/-.010	E	F	G	H	J +/-.010
0.50	0.719	0.360	0.312	1.594	0.797	0.750	1.500	0.938	1.875
0.75	0.938	0.469	0.406	2.000	1.000	0.938	1.875	1.188	2.375
1.00	1.094	0.547	0.469	2.250	1.125	1.062	2.125	1.375	2.750
1.25	1.250	0.625	0.562	2.625	1.312	1.188	2.375	1.531	3.062
1.50	1.438	0.719	0.656	3.125	1.562	1.375	2.750	1.875	3.750
2.00	1.750	0.875	0.719	3.812	1.906	1.688	3.375	2.250	4.500
2.50 (+)	2.312	1.156	1.000	4.875	2.438	2.188	4.375	2.938	5.875
3.00 (+)	2.812	1.406	1.250	6.000	3.000	2.688	5.375	3.500	7.000

ISO 6162 Type I - Metric Mounting Dimensions

Nominal Size	Thru Hole Diameter	Mounting Thread	Mtg. Thread Depth (min)*	Counterbore Diameter
0.50	0.344	M 8x1.25-6H	0.812 / (0.571)	0.562
0.75	0.422	M10x1.50-6H	0.938 / (0.650)	0.688
1.00	0.500	M12x1.75-6H	1.062 / (0.846)	0.750
1.25	0.500	M12x1.75-6H	1.000 / (0.728)	0.750
1.50	0.656	M16x2.00-6H	1.375 / (1.004)	1.000
2.00	0.812	M20x2.50-6H	1.500 / (1.319)	1.250
2.50				
3.00				

* = Design Depth per SAE J518 / (ISO 6162 Depth)

SAE J518 / ISO 6162 Type II - Inch Mounting Dimensions

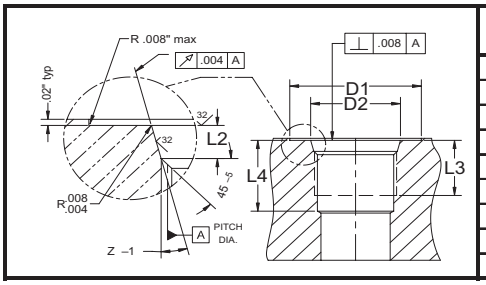
Nominal Size	Thru Hole Diameter	Mounting Thread	Mtg. Thread Depth	Counterbore Diameter
0.50	0.344	5/16-18 UNC-2B	0.812	0.500
0.75	0.406	3/8-16 UNC-2B	0.938	0.590
1.00	0.469	7/16-14 UNC-2B	1.062	0.688
1.25	0.531	1/2-13 UNC-2B	1.000	0.781
1.50	0.656	5/8-11 UNC-2B	1.375	0.969
2.00	0.781	3/4-10 UNC-2B	1.500	1.188
2.50 (+)	0.906	7/8 - 9 UNC-2B	1.812	1.375
3.00 (+)	1.188	1 1/8-7 UNC-2B	2.312	1.750

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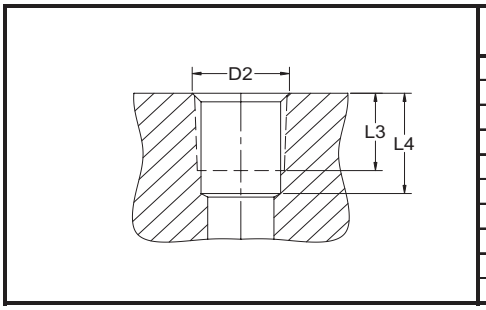
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Manifolds & Valve Packs

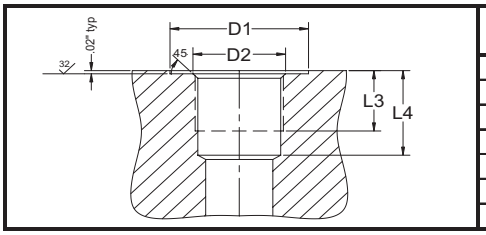
General Port Specifications



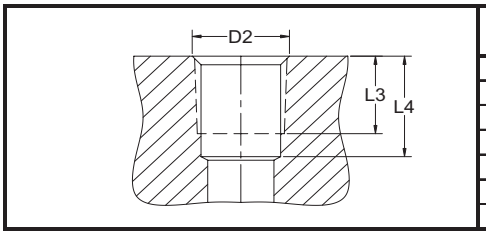
SAE PORTS	Per ISO 11926-1 & SAE J1926-1						
	THREAD	D1 (min)	D2 –.002	L2 +0/.015	L3 (min)	L4 (min)	Z ±1°
-4	7/16" - 20	0.827	0.488	0.094	0.453	0.547	12
-6	9/16" - 18	0.984	0.614	0.098	0.500	0.609	12
-8	3/4" - 16	1.181	0.811	0.098	0.563	0.688	15
-10	7/8" - 14	1.339	0.941	0.098	0.657	0.781	15
-12	1 1/16" - 12	1.614	1.150	0.130	0.750	0.906	15
-16	1 5/16" - 12	1.929	1.398	0.130	0.750	0.906	15
-20	1 5/8" - 12	2.283	1.713	0.130	0.750	0.906	15
-24	1 7/8" - 12	2.559	1.961	0.130	0.750	0.906	15
-32	2 1/2" - 12	3.465	2.587	0.130	0.750	0.906	15



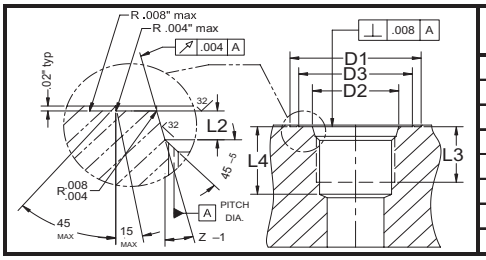
NPT PORTS	Per SAE J476 & ANSI B1.20.3			
	THREAD	D2	L3	L4
1/16"	1/16" - 27	0.32	0.31	0.38
1/8"	1/8" - 27	0.42	0.31	0.38
1/4"	1/4" - 18	0.55	0.44	0.47
3/8"	3/8" - 18	0.69	0.47	0.53
1/2"	1/2" - 14	0.85	0.59	0.69
3/4"	3/4" - 14	1.06	0.63	0.75
1"	1" - 11.5	1.34	0.75	0.84
1 1/4"	1 1/4" - 11.5	1.68	0.78	0.84
1 1/2"	1 1/2" - 11.5	1.92	0.81	0.88
2"	2" - 11.5	2.39	0.81	0.91



BSPP PORTS	Per ISO 1179-1 & BS 2779				
	THREAD	D1 (min)	D2	L3 (min)	L4 (min)
1/4"	G 1/4" - 19	0.846	0.524	0.472	0.625
3/8"	G 3/8" - 19	1.004	0.661	0.472	0.625
1/2"	G 1/2" - 14	1.181	0.835	0.551	0.748
3/4"	G 3/4" - 14	1.437	1.047	0.630	0.906
1"	G 1" - 11	1.811	1.319	0.709	1.024
1 1/4"	G 1 1/4" - 11	2.244	1.661	0.787	1.142
1 1/2"	G 1 1/2" - 11	2.500	1.894	0.866	1.142



BSPT PORTS	Per ISO 7			
	THREAD	D2	L3	L4
1/4"	1/4" - 19	0.55	0.44	0.47
3/8"	3/8" - 19	0.69	0.47	0.53
1/2"	1/2" - 14	0.85	0.59	0.69
3/4"	3/4" - 14	1.06	0.63	0.75
1"	1" - 11	1.34	0.75	0.84
1 1/4"	1 1/4" - 11	1.68	0.78	0.84
1 1/2"	1 1/2" - 11	1.92	0.81	0.88



METRIC PORTS	Per ISO 6149-1							
	THREAD	D1 (min)	D2 +0/.004	D3 (min)	L2 +0/.015	L3 (min)	L4 (min)	Z ±1°
M10	M10 x 1.0	0.787	0.437	0.630	0.063	0.393	0.453	12
M14	M14 x 1.5	0.984	0.622	0.827	0.094	0.453	0.551	15
M18	M18 x 1.5	1.181	0.780	1.024	0.094	0.571	0.669	15
M22	M22 x 1.5	1.339	0.937	1.142	0.094	0.610	0.709	15
M27	M27 x 2.0	1.575	1.157	1.339	0.125	0.748	0.866	15
M33	M33 x 2.0	1.929	1.393	1.693	0.125	0.748	0.866	15
M42	M42 x 2.0	2.362	1.750	2.047	0.125	0.768	0.886	15
M48	M48 x 2.0	2.598	1.984	2.244	0.125	0.866	0.984	15

Notes:

1)For Metric Ports, D1 Spotface for ports with identification ridge as shown by dimension D3.

2) For Metric Ports, when identification ridge is not machined, port must be stamped as "Metric" or component must be stamped "ISO 6149-1 Metric"

3) For all Port Types, L4 tap drill depth for L3 full thread depth requires the use of a botto ming tap.

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