Table of variations

Standard female ø36.5 FLANGE

X2I-2

Standard female ø36.5 FLANGE			
Left rotation		Right rotation	
	01		02

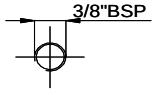
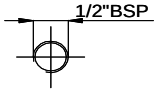
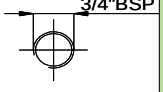
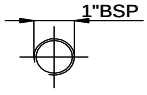
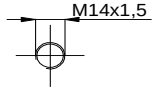
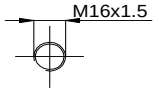
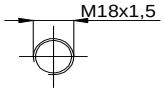
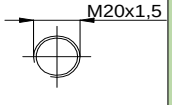
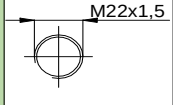
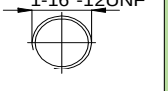
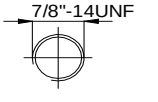
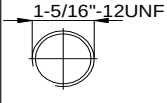
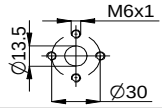
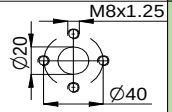
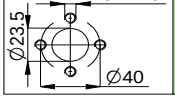
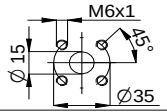
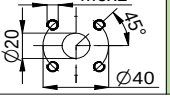
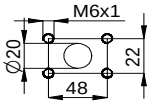
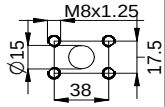
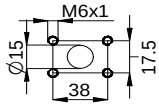
Shaft	
SCI01 - Splined T.2 = 86.2 [Nm] m=1,6 Z=9 DIN 5482 - 17x14 	P

Cover		
Left rotation	Right rotation	
		A
		D

Displacement	
TYPE	CODE
X2I-2/04	**41**
X2I-2/06	**43**
X2I-2/09	**45**
X2I-2/11	**47**
X2I-2/14	**49**
X2I-2/17	**51**
X2I-2/19	**53**
X2I-2/22	**55**
X2I-2/26	**57**
X2I-2/30	**59**
X2I-2/34	**61**
X2I-2/40	**63**

Standard bodies				
Displacement cm3/rev	Standard threads			
4	O - O	S - R	B - B	L - M
6	O - O	S - R	B - B	L - M
9	O - O	S - R	B - B	L - M
11	O - O	S - R	B - B	L - M
14	P - O	S - R	C - B	L - M
17	P - O	S - R	C - B	L - M
19	P - O	S - R	C - B	L - M
22	P - O	S - R	C - B	L - M
26	Q - P	S - R	D - C	L - M
30	Q - P	S - S	D - C	L - M
34	Q - P	S - S	D - C	L - M
40	Q - P	S - S	D - C	L - M

Table showing standard flange and thread combinations available in stock

Body (threads/flanges)																				
	A		B		C		D		E		F		G
	H		I		L		M		N		O		P
	Q		R		S		T		U		V	Closed Body	Z

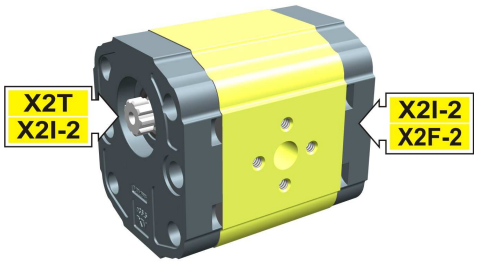
intermediate pump - series XV

SHAPED FINAL PUMP
SHAPED FEMALE ø36,5 FLANGE

X2I-2

X	2	I	51	72	P	P	O	D

Series	X	series XV
Group	2	group 2
Category	I	intermediate pump
Displacement	51	17
Flange	72	Ø36.5 body-shaped female right rotation 2P+2P
Shaft	P	SCI01 - Intermediate
Body IN	P	inlet - Ø40 Ø20 M8
Body OUT	O	outlet - Ø30 Ø13.5 M6
Cover	D	ø36,5 body-shaped female cover for left multiple pump element



XI202

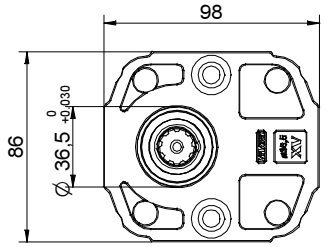
Technical data table

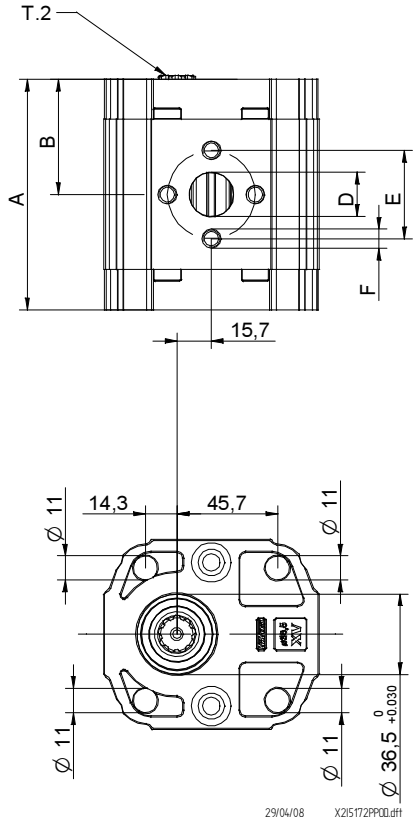
TYPE	Displacement	Max. Pressure		CODE															
	cm3/rev	P1 bar	P3 bar	Left rotation									Right rotation						
X2I-2/04	4,20	260	300	X	2	I	41	71	P	O	O	D	X	2	I	41	72	P	O	O	D
X2I-2/06	6,00	260	300	X	2	I	43	71	P	O	O	D	X	2	I	43	72	P	O	O	D
X2I-2/09	8,40	260	300	X	2	I	45	71	P	O	O	D	X	2	I	45	72	P	O	O	D
X2I-2/11	10,80	260	300	X	2	I	47	71	P	O	O	D	X	2	I	47	72	P	O	O	D
X2I-2/14	14,40	250	290	X	2	I	49	71	P	P	O	D	X	2	I	49	72	P	P	O	D
X2I-2/17	16,80	230	270	X	2	I	51	71	P	P	O	D	X	2	I	51	72	P	P	O	D
X2I-2/19	19,20	210	250	X	2	I	53	71	P	P	O	D	X	2	I	53	72	P	P	O	D
X2I-2/22	22,80	200	240	X	2	I	55	71	P	P	O	D	X	2	I	55	72	P	P	O	D
X2I-2/26	26,20	170	210	X	2	I	57	71	P	Q	P	D	X	2	I	57	72	P	Q	P	D
X2I-2/30	30,00	160	200	X	2	I	59	71	P	Q	P	D	X	2	I	59	72	P	Q	P	D
X2I-2/34	34,20	150	190	X	2	I	61	71	P	Q	P	D	X	2	I	61	72	P	Q	P	D
X2I-2/40	39,60	140	180	X	2	I	63	71	P	Q	P	D	X	2	I	63	72	P	Q	P	D

P1) Max. working pressure - P3) Max. peak pressure
For heavy-duty applications, it is recommended to check the admissible torque of the shaft

Dimensions table

TYPE	Weight	A	B	D	E	F	D	E	F
	kg	mm	mm	IN			OUT		
X2I-2/04	2,200	83,4	41,7	ø13,5	30	M6x1	ø13,5	30	M6x1
X2I-2/06	2,300	86,4	43,2	ø13,5	30	M6x1	ø13,5	30	M6x1
X2I-2/09	2,400	90,4	45,2	ø13,5	30	M6x1	ø13,5	30	M6x1
X2I-2/11	2,500	94,4	47,2	ø13,5	30	M6x1	ø13,5	30	M6x1
X2I-2/14	2,700	100,4	50,2	ø20	40	M8X1,25	ø13,5	30	M6x1
X2I-2/17	2,800	104,4	52,2	ø20	40	M8X1,25	ø13,5	30	M6x1
X2I-2/19	2,900	108,4	54,2	ø20	40	M8X1,25	ø13,5	30	M6x1
X2I-2/22	3,050	114,4	57,2	ø20	40	M8X1,25	ø13,5	30	M6x1
X2I-2/26	3,150	118,4	59,2	ø23,5	40	M8X1,25	ø20	40	M8X1,25
X2I-2/30	3,400	126,4	63,2	ø23,5	40	M8X1,25	ø20	40	M8X1,25
X2I-2/34	3,600	133,4	66,7	ø23,5	40	M8X1,25	ø20	40	M8X1,25
X2I-2/40	3,800	142,4	71,2	ø23,5	40	M8X1,25	ø20	40	M8X1,25





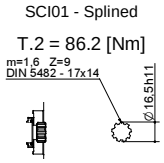
T.2 = 86.2 [Nm] - admissible shaft torque (N.B. When choosing a shaft, always check the admissible torque).

Table of variations

Shaped female ø36.5 FLANGE

X2I-2

Shaped female ø36.5 FLANGE			
Left rotation		Right rotation	
	71		72

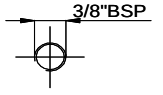
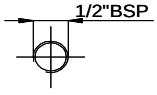
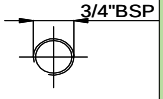
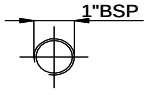
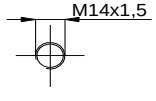
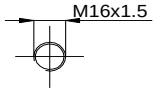
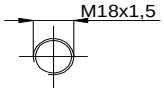
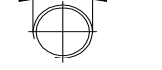
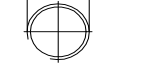
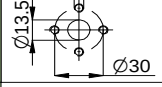
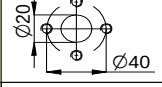
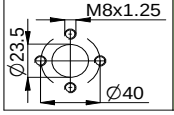
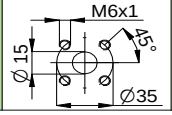
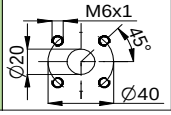
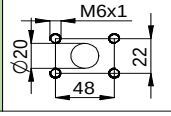
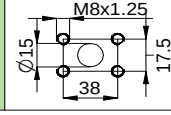
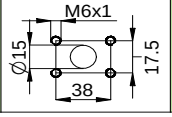
Shaft	
	P

Cover		
Left rotation	Right rotation	
		A
		D

Displacement	
TYPE	CODE
X2I-2/04	**41**
X2I-2/06	**43**
X2I-2/09	**45**
X2I-2/11	**47**
X2I-2/14	**49**
X2I-2/17	**51**
X2I-2/19	**53**
X2I-2/22	**55**
X2I-2/26	**57**
X2I-2/30	**59**
X2I-2/34	**61**
X2I-2/40	**63**

Standard bodies				
Displacement cm3/rev	Standard threads			
4	O - O	S - R	B - B	L - M
6	O - O	S - R	B - B	L - M
9	O - O	S - R	B - B	L - M
11	O - O	S - R	B - B	L - M
14	P - O	S - R	C - B	L - M
17	P - O	S - R	C - B	L - M
19	P - O	S - R	C - B	L - M
22	P - O	S - R	C - B	L - M
26	Q - P	S - R	D - C	L - M
30	Q - P	S - S	D - C	L - M
34	Q - P	S - S	D - C	L - M
40	Q - P	S - S	D - C	L - M

Table showing standard flange and thread combinations available in stock

Body (threads/flanges)																				
	A		B		C		D		E		F		G
	H		I		L		M		N		O		P
	Q		R		S		T		U		V	Closed Body	Z

final pump - series XV

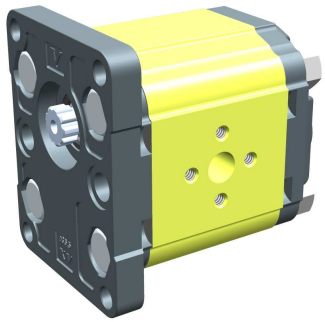
STANDARD FINAL PUMP
FEMALE ø36,5 FLANGE

X2F-2

X	2	F	51	02	Q	P	O	A

Series		X	series XV
Group		2	group 2
Category		F	final pump
Displacement		51	17
Flange		02	Ø36.5 female right rotation 2P+2P, 3P+2P
Shaft		Q	SCF01 - Final
Body	IN	P	inlet - Ø40 Ø20 M8
	OUT	O	outlet - Ø30 Ø13.5 M6
Cover		A	standard

X2T
X2I-2
X3T
X3I-3

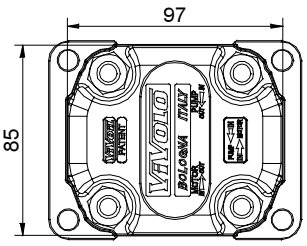


XF201

Technical data table

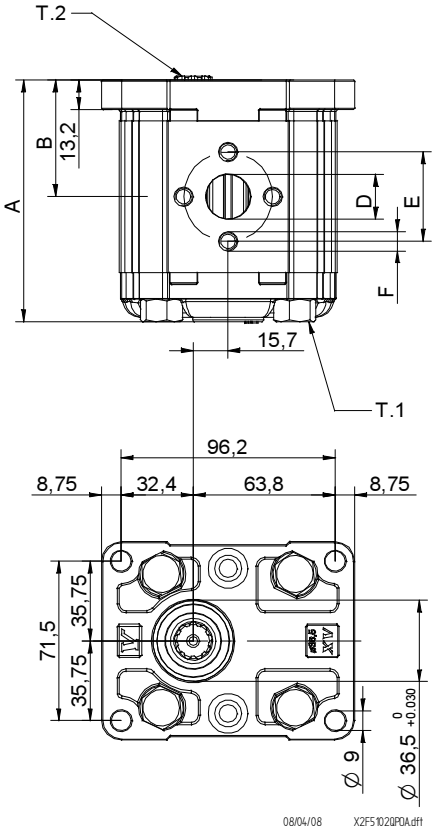
TYPE	Displacement	Max. Pressure		CODE	
	cm3/rev	P1 bar	P3 bar	Left rotation	Right rotation
X2F-2/04	4,20	260	300	X 2 F 41 01 Q O O A	X 2 F 41 02 Q O O A
X2F-2/06	6,00	260	300	X 2 F 43 01 Q O O A	X 2 F 43 02 Q O O A
X2F-2/09	8,40	260	300	X 2 F 45 01 Q O O A	X 2 F 45 02 Q O O A
X2F-2/11	10,80	260	300	X 2 F 47 01 Q O O A	X 2 F 47 02 Q O O A
X2F-2/14	14,40	250	290	X 2 F 49 01 Q P O A	X 2 F 49 02 Q P O A
X2F-2/17	16,80	230	270	X 2 F 51 01 Q P O A	X 2 F 51 02 Q P O A
X2F-2/19	19,20	210	250	X 2 F 53 01 Q P O A	X 2 F 53 02 Q P O A
X2F-2/22	22,80	200	240	X 2 F 55 01 Q P O A	X 2 F 55 02 Q P O A
X2F-2/26	26,20	170	210	X 2 F 57 01 Q Q P A	X 2 F 57 02 Q Q P A
X2F-2/30	30,00	160	200	X 2 F 59 01 Q Q P A	X 2 F 59 02 Q Q P A
X2F-2/34	34,20	150	190	X 2 F 61 01 Q Q P A	X 2 F 61 02 Q Q P A
X2F-2/40	39,60	140	180	X 2 F 63 01 Q Q P A	X 2 F 63 02 Q Q P A

P1) Max. working pressure - P3) Max. peak pressure
For heavy-duty applications, it is recommended to check the admissible torque of the shaft



Dimensions table

TYPE	Weight	A	B	D	E	F	D	E	F
	kg	mm	mm	IN			OUT		
X2F-2/04	2,200	87,2	41,7	ø13,5	30	M6x1	ø13,5	30	M6x1
X2F-2/06	2,300	90,2	43,2	ø13,5	30	M6x1	ø13,5	30	M6x1
X2F-2/09	2,400	94,2	45,2	ø13,5	30	M6x1	ø13,5	30	M6x1
X2F-2/11	2,500	98,2	47,2	ø13,5	30	M6x1	ø13,5	30	M6x1
X2F-2/14	2,700	104,2	50,2	ø20	40	M8X1,25	ø13,5	30	M6x1
X2F-2/17	2,800	108,2	52,2	ø20	40	M8X1,25	ø13,5	30	M6x1
X2F-2/19	2,900	112,2	54,2	ø20	40	M8X1,25	ø13,5	30	M6x1
X2F-2/22	3,050	118,2	57,2	ø20	40	M8X1,25	ø13,5	30	M6x1
X2F-2/26	3,150	122,2	59,2	ø23,5	40	M8X1,25	ø20	40	M8X1,25
X2F-2/30	3,400	130,2	63,2	ø23,5	40	M8X1,25	ø20	40	M8X1,25
X2F-2/34	3,600	137,2	66,7	ø23,5	40	M8X1,25	ø20	40	M8X1,25
X2F-2/40	3,800	146,2	71,2	ø23,5	40	M8X1,25	ø20	40	M8X1,25



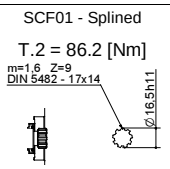
T.1 = 54÷58.9 [Nm] - screw tightening torque M10
T.2 = 86.2 [Nm] - admissible shaft torque (N.B. When choosing a shaft, always check the admissible torque).

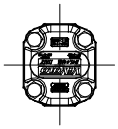
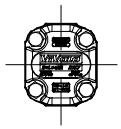
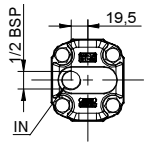
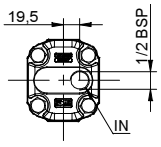
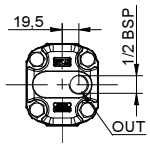
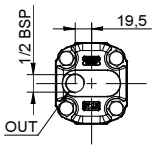
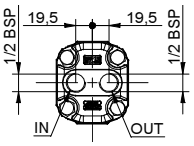
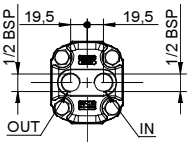
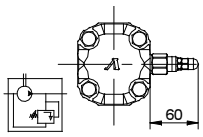
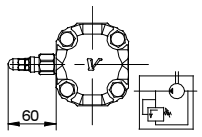
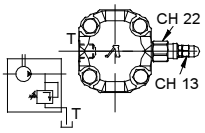
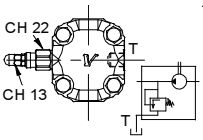
Table of variations

Standard female ø36.5 FLANGE

X2F-2

Standard female ø36.5 FLANGE			
Left rotation		Right rotation	
	01		02

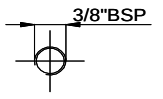
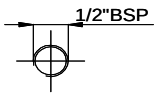
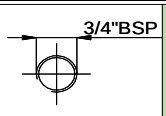
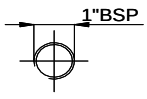
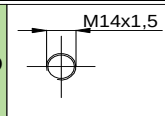
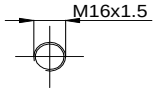
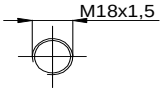
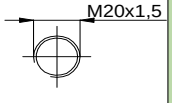
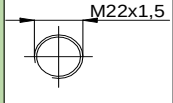
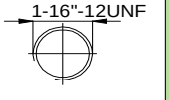
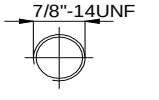
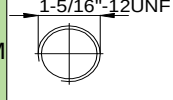
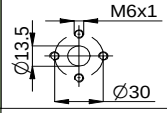
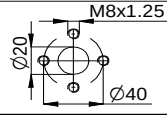
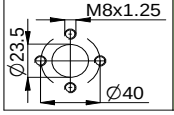
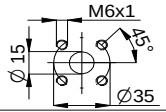
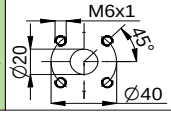
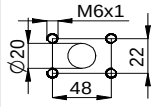
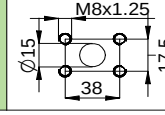
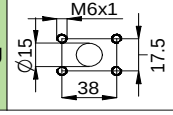
Shaft	
	Q

Cover		
Left rotation	Right rotation	
		A
		B
		C
		D
 Internal drainage		N
 External drainage		O

Displacement	
TYPE	CODE
X2F-2/04	**41**
X2F-2/06	**43**
X2F-2/09	**45**
X2F-2/11	**47**
X2F-2/14	**49**
X2F-2/17	**51**
X2F-2/19	**53**
X2F-2/22	**55**
X2F-2/26	**57**
X2F-2/30	**59**
X2F-2/34	**61**
X2F-2/40	**63**

Standard bodies					
Displacement cm3/rev	Standard threads				
4	O - O	S - R	B - B	L - M	Z - Z
6	O - O	S - R	B - B	L - M	Z - Z
9	O - O	S - R	B - B	L - M	Z - Z
11	O - O	S - R	B - B	L - M	Z - Z
14	P - O	S - R	C - B	L - M	Z - Z
17	P - O	S - R	C - B	L - M	Z - Z
19	P - O	S - R	C - B	L - M	Z - Z
22	P - O	S - R	C - B	L - M	Z - Z
26	Q - P	S - R	D - C	L - M	Z - Z
30	Q - P	S - S	D - C	L - M	Z - Z
34	Q - P	S - S	D - C	L - M	Z - Z
40	Q - P	S - S	D - C	L - M	Z - Z

Table showing standard flange and thread combinations available in stock

Body (threads/flanges)														
	A		B		C		D		E		F		G
	H		I		L		M		N		O		P
	Q		R		S		T		U		V	Closed Body	Z

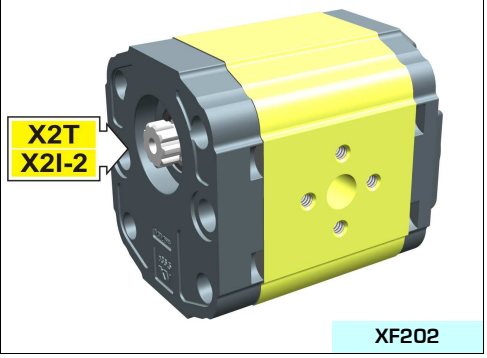
final pump - series XV

SHAPED FINAL PUMP
SHAPED FEMALE ø36,5 FLANGE

X2F-2

X	2	F	51	72	Q	P	O	A

Series	X	series XV
Group	2	group 2
Category	F	final pump
Displacement	51	17
Flange	72	Ø36.5 body-shaped female right rotation 2P+2P
Shaft	Q	SCF01 - Final
Body IN	P	inlet - Ø40 Ø20 M8
Body OUT	O	outlet - Ø30 Ø13.5 M6
Cover	A	standard

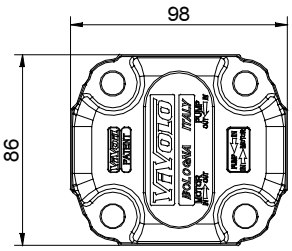


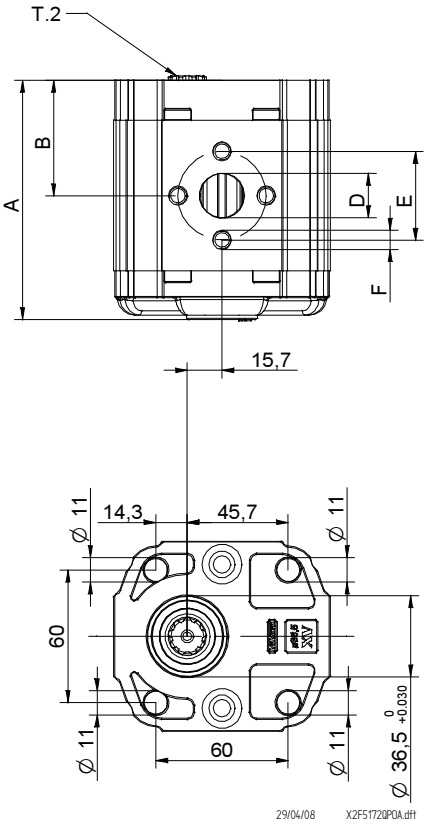
XF202

Technical data table

TYPE	Displacement	Max. Pressure		CODE	
	cm3/rev	P1 bar	P3 bar	Left rotation	Right rotation
X2F-2/04	4,20	260	300	X 2 F 41 71 Q O O A	X 2 F 41 72 Q O O A
X2F-2/06	6,00	260	300	X 2 F 43 71 Q O O A	X 2 F 43 72 Q O O A
X2F-2/09	8,40	260	300	X 2 F 45 71 Q O O A	X 2 F 45 72 Q O O A
X2F-2/11	10,80	260	300	X 2 F 47 71 Q O O A	X 2 F 47 72 Q O O A
X2F-2/14	14,40	250	290	X 2 F 49 71 Q P O A	X 2 F 49 72 Q P O A
X2F-2/17	16,80	230	270	X 2 F 51 71 Q P O A	X 2 F 51 72 Q P O A
X2F-2/19	19,20	210	250	X 2 F 53 71 Q P O A	X 2 F 53 72 Q P O A
X2F-2/22	22,80	200	240	X 2 F 55 71 Q P O A	X 2 F 55 72 Q P O A
X2F-2/26	26,20	170	210	X 2 F 57 71 Q Q P A	X 2 F 57 72 Q Q P A
X2F-2/30	30,00	160	200	X 2 F 59 71 Q Q P A	X 2 F 59 72 Q Q P A
X2F-2/34	34,20	150	190	X 2 F 61 71 Q Q P A	X 2 F 61 72 Q Q P A
X2F-2/40	39,60	140	180	X 2 F 63 71 Q Q P A	X 2 F 63 72 Q Q P A

P1) Max. working pressure - P3) Max. peak pressure
For heavy-duty applications, it is recommended to check the admissible torque of the shaft





Dimensions table

TYPE	Weight	A	B	D	E	F	D	E	F
	kg	mm	mm	IN			OUT		
X2F-2/04	2,200	87,2	41,7	ø13,5	30	M6x1	ø13,5	30	M6x1
X2F-2/06	2,300	90,2	43,2	ø13,5	30	M6x1	ø13,5	30	M6x1
X2F-2/09	2,400	94,2	45,2	ø13,5	30	M6x1	ø13,5	30	M6x1
X2F-2/11	2,500	98,2	47,2	ø13,5	30	M6x1	ø13,5	30	M6x1
X2F-2/14	2,700	104,2	50,2	ø20	40	M8X1,25	ø13,5	30	M6x1
X2F-2/17	2,800	108,2	52,2	ø20	40	M8X1,25	ø13,5	30	M6x1
X2F-2/19	2,900	112,2	54,2	ø20	40	M8X1,25	ø13,5	30	M6x1
X2F-2/22	3,050	118,2	57,2	ø20	40	M8X1,25	ø13,5	30	M6x1
X2F-2/26	3,150	122,2	59,2	ø23,5	40	M8X1,25	ø20	40	M8X1,25
X2F-2/30	3,400	130,2	63,2	ø23,5	40	M8X1,25	ø20	40	M8X1,25
X2F-2/34	3,600	137,2	66,7	ø23,5	40	M8X1,25	ø20	40	M8X1,25
X2F-2/40	3,800	146,2	71,2	ø23,5	40	M8X1,25	ø20	40	M8X1,25

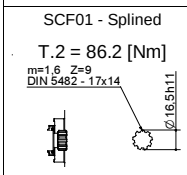
T.2 = 86.2 [Nm] - admissible shaft torque (N.B. When choosing a shaft, always check the admissible torque).

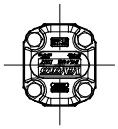
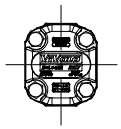
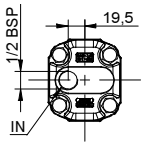
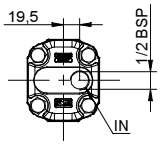
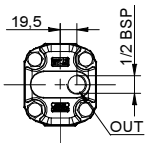
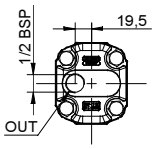
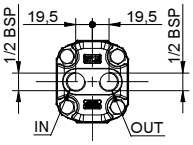
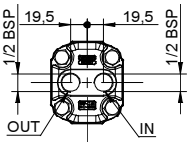
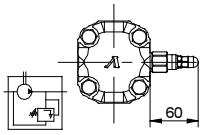
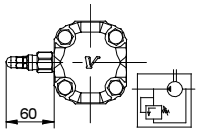
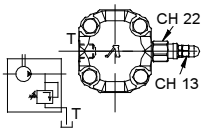
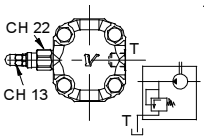
Table of variations

Shaped female ø36.5 FLANGE

X2F-2

Shaped female ø36.5 FLANGE			
Left rotation		Right rotation	
	71		72

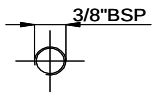
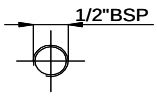
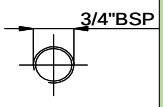
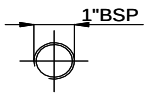
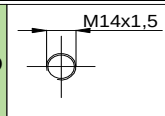
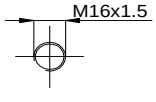
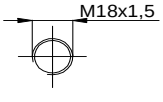
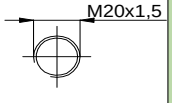
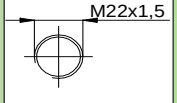
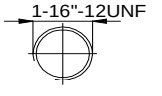
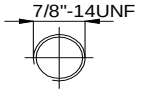
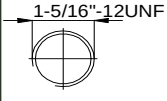
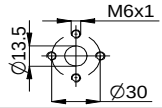
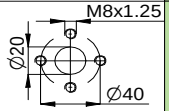
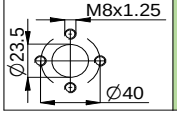
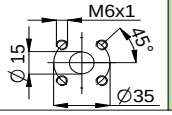
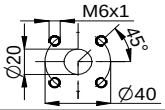
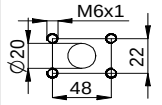
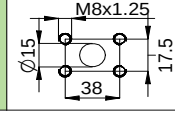
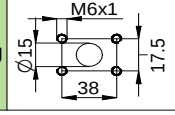
Shaft	
	Q

Cover		
Left rotation	Right rotation	
		A
		B
		C
		D
 Internal drainage		N
 External drainage		O

Displacement	
TYPE	CODE
X2F-2/04	**41**
X2F-2/06	**43**
X2F-2/09	**45**
X2F-2/11	**47**
X2F-2/14	**49**
X2F-2/17	**51**
X2F-2/19	**53**
X2F-2/22	**55**
X2F-2/26	**57**
X2F-2/30	**59**
X2F-2/34	**61**
X2F-2/40	**63**

Standard bodies					
Displacement cm3/rev	Standard threads				
4	O - O	S - R	B - B	L - M	Z - Z
6	O - O	S - R	B - B	L - M	Z - Z
9	O - O	S - R	B - B	L - M	Z - Z
11	O - O	S - R	B - B	L - M	Z - Z
14	P - O	S - R	C - B	L - M	Z - Z
17	P - O	S - R	C - B	L - M	Z - Z
19	P - O	S - R	C - B	L - M	Z - Z
22	P - O	S - R	C - B	L - M	Z - Z
26	Q - P	S - R	D - C	L - M	Z - Z
30	Q - P	S - S	D - C	L - M	Z - Z
34	Q - P	S - S	D - C	L - M	Z - Z
40	Q - P	S - S	D - C	L - M	Z - Z

Table showing standard flange and thread combinations available in stock

Body (threads/flanges)														
	A		B		C		D		E		F		G
	H		I		L		M		N		O		P
	Q		R		S		T		U		V	Closed Body	Z

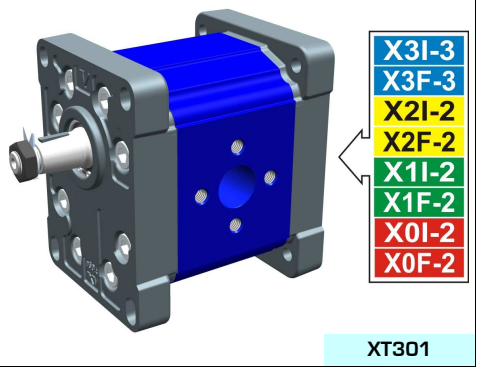
entrainment pump - series XV

EUROPEAN STANDARD DRIVING PUMP
ø50.8 FLANGE - TAPER SHAFT

X3T

X	3	T	78	02	A	B	B	A

Series		X	series XV
Group		3	group 3
Category		T	entrainment pump
Displacement		78	38
Flange		02	Ø50.8 right rotation
Shaft		A	COP01 - Tapered 1:8 - ø22 - key thk.4
Body	IN	B	inlet - Ø51 Ø27 M10
	OUT	B	outlet - Ø51 Ø27 M10
Cover		A	ø50,8 female cover for left multiple pump element



XT301

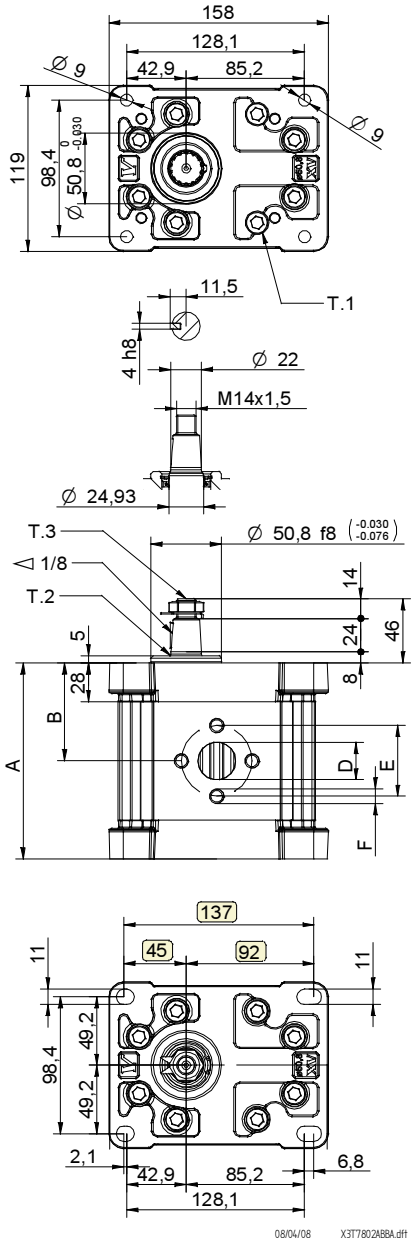
Technical data table

TYPE	Displacement	Max. Pressure		CODE															
	cm3/rev	P1 bar	P3 bar	Left rotation								Right rotation							
X3T/15	14,89	300	320	X	3	T	66	01	A	A	A	X	3	T	66	02	A	A	A
X3T/18	17,37	300	320	X	3	T	68	01	A	A	A	X	3	T	68	02	A	A	A
X3T/21	21,10	280	300	X	3	T	70	01	A	A	A	X	3	T	70	02	A	A	A
X3T/27	26,97	250	270	X	3	T	72	01	A	A	A	X	3	T	72	02	A	A	A
X3T/32	32,27	250	270	X	3	T	74	01	A	B	B	X	3	T	74	02	A	B	B
X3T/38	38,47	250	270	X	3	T	78	01	A	B	B	X	3	T	78	02	A	B	B
X3T/43	43,44	250	270	X	3	T	79	01	A	B	B	X	3	T	79	02	A	B	B
X3T/47	47,16	230	250	X	3	T	80	01	A	B	B	X	3	T	80	02	A	B	B
X3T/51	50,88	230	250	X	3	T	81	01	A	B	B	X	3	T	81	02	A	B	B
X3T/54	54,60	230	250	X	3	T	82	01	A	B	B	X	3	T	82	02	A	B	B
X3T/61	60,81	230	250	X	3	T	83	01	A	C	C	X	3	T	83	02	A	C	C
X3T/64	64,53	210	230	X	3	T	85	01	A	C	C	X	3	T	85	02	A	C	C
X3T/70	70,74	200	220	X	3	T	86	01	A	C	C	X	3	T	86	02	A	C	C
X3T/74	74,46	180	200	X	3	T	87	01	A	C	C	X	3	T	87	02	A	C	C
X3T/90	86,87	150	170	X	3	T	89	01	A	C	C	X	3	T	89	02	A	C	C

P1) Max. working pressure - P3) Max. peak pressure
For heavy-duty applications, it is recommended to check the admissible torque of the shaft

Dimensions table

TYPE	Weight	A	B	D	E	F	D	E	F
	kg	mm	mm	IN			OUT		
X3T/15	7,010	122,0	61,0	ø20	40	M8	ø20	40	M8
X3T/18	7,070	124,0	62,0	ø20	40	M8	ø20	40	M8
X3T/21	7,150	127,0	63,5	ø20	40	M8	ø20	40	M8
X3T/27	7,250	131,0	65,5	ø20	40	M8	ø20	40	M8
X3T/32	7,390	136,0	68,0	ø27	51	M10	ø27	51	M10
X3T/38	7,520	141,0	70,5	ø27	51	M10	ø27	51	M10
X3T/43	7,630	145,0	72,5	ø27	51	M10	ø27	51	M10
X3T/47	7,710	148,0	74,0	ø27	51	M10	ø27	51	M10
X3T/51	7,790	151,0	75,5	ø27	51	M10	ø27	51	M10
X3T/54	7,870	154,0	77,0	ø27	51	M10	ø27	51	M10
X3T/61	8,010	159,0	79,5	ø36	62	M10	ø36	62	M10
X3T/64	8,090	162,0	81,0	ø36	62	M10	ø36	62	M10
X3T/70	8,220	167,0	83,5	ø36	62	M10	ø36	62	M10
X3T/74	8,300	170,0	85,0	ø36	62	M10	ø36	62	M10
X3T/90	8,570	180,0	90,0	ø36	62	M10	ø36	62	M10

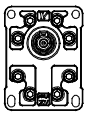


T.1 = 60÷65 [Nm] - screw tightening torque M10
T.3 = 75 [Nm] - torque wrench setting 22
T.2 = 482 [Nm] - admissible shaft torque (N.B. When choosing a shaft, always check the admissible torque).

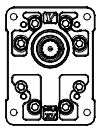
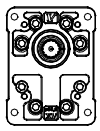
Table of variations

ø50.8 FLANGE

X3T

ø50.8 FLANGE			
Left rotation		Right rotation	
	01		02

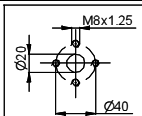
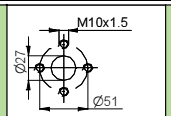
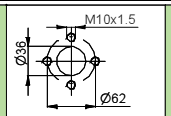
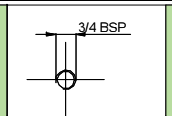
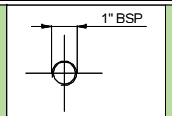
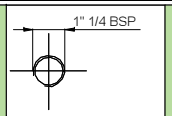
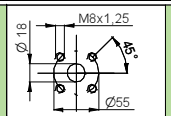
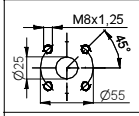
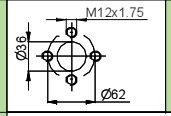
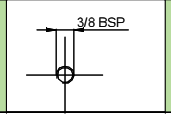
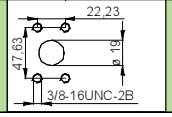
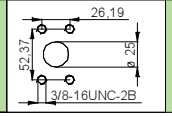
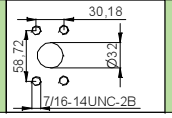
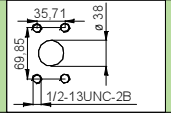
Shaft			
COP01 - Tapered T.2 = 482 [Nm]	A	CIP01 - Parallel T.2 = 181 [Nm]	B
SCP03 - Splined T.2 = 223 [Nm]	C	CIP04 - Parallel T.2 = 180 [Nm]	H
SCP04 - Splined T.2 = 264 [Nm]	I		

Cover		
Left rotation	Right rotation	
		A

Displacement	
TYPE	CODE
X3T/15	**66**
X3T/18	**68**
X3T/21	**70**
X3T/27	**72**
X3T/32	**74**
X3T/38	**78**
X3T/43	**79**
X3T/47	**80**
X3T/51	**81**
X3T/54	**82**
X3T/61	**83**
X3T/64	**85**
X3T/70	**86**
X3T/74	**87**
X3T/90	**89**

Standard bodies			
Displacement cm3/rev	Standard threads		
15	A - A	D - D	H – H
18	A - A	D - D	H – H
21	A - A	D - D	H – H
27	A - A	E - E	H – H
32	B - B	E - E	H – H
38	B - B	E - E	H – H
43	B - B	E - E	H – H
47	B - B	E - E	H – H
51	B - B	E - E	H – H
54	B - B	E - E	H – H
61	C - C	F - F	
64	C - C	F - F	
70	C - C	F - F	
74	C - C	F - F	
90	C - C	F - F	

Table showing standard flange and thread combinations available in stock

Body (threads/flanges)														
	A		B		C		D		E		F		G
	H		I		L		M		N		O		P
Closed Body	Z													

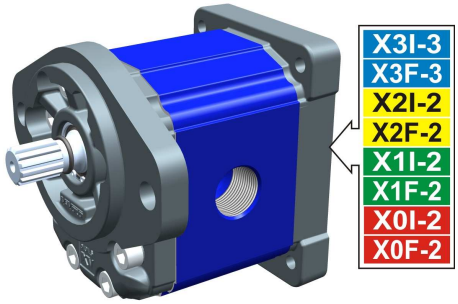
entrainment pump - series XV

"SAE B" DRIVING PUMP
ø101.6 FLANGE - SPLINED SHAFT

X3T

X	3	T	78	32	I	E	E	A

Series		X	series XV
Group		3	group 3
Category		T	entrainment pump
Displacement		78	38
Flange		32	Ø101.6 SAE B right rotation
Shaft		I	
Body	IN	E	inlet - 1" BSP
	OUT	E	outlet - 1" BSP
Cover		A	ø50,8 female cover for left multiple pump element



XT331

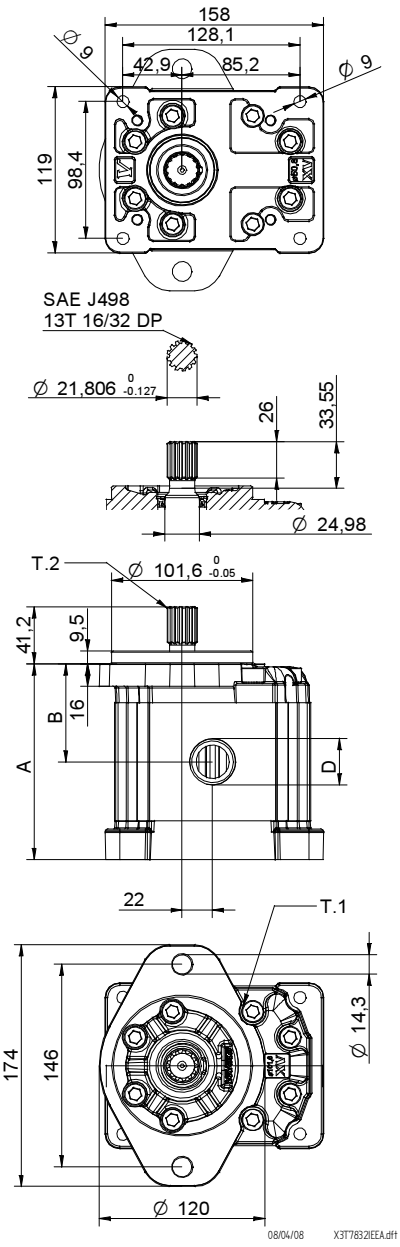
Technical data table

TYPE	Displacement	Max. Pressure		CODE															
	cm3/rev	P1 bar	P3 bar	Left rotation									Right rotation						
X3T/15	14,89	300	320	X	3	T	66	31	I	D	D	A	X	3	T	66	32	I	D	D	A
X3T/18	17,37	300	320	X	3	T	68	31	I	D	D	A	X	3	T	68	32	I	D	D	A
X3T/21	21,10	280	300	X	3	T	70	31	I	D	D	A	X	3	T	70	32	I	D	D	A
X3T/27	26,97	250	270	X	3	T	72	31	I	E	E	A	X	3	T	72	32	I	E	E	A
X3T/32	32,27	250	270	X	3	T	74	31	I	E	E	A	X	3	T	74	32	I	E	E	A
X3T/38	38,47	250	270	X	3	T	78	31	I	E	E	A	X	3	T	78	32	I	E	E	A
X3T/43	43,44	250	270	X	3	T	79	31	I	E	E	A	X	3	T	79	32	I	E	E	A
X3T/47	47,16	230	250	X	3	T	80	31	I	E	E	A	X	3	T	80	32	I	E	E	A
X3T/51	50,88	230	250	X	3	T	81	31	I	E	E	A	X	3	T	81	32	I	E	E	A
X3T/54	54,60	230	250	X	3	T	82	31	I	E	E	A	X	3	T	82	32	I	E	E	A
X3T/61	60,81	230	250	X	3	T	83	31	I	F	F	A	X	3	T	83	32	I	F	F	A
X3T/64	64,53	210	230	X	3	T	85	31	I	F	F	A	X	3	T	85	32	I	F	F	A
X3T/70	70,74	200	220	X	3	T	86	31	I	F	F	A	X	3	T	86	32	I	F	F	A
X3T/74	74,46	180	200	X	3	T	87	31	I	F	F	A	X	3	T	87	32	I	F	F	A
X3T/90	86,87	150	170	X	3	T	89	31	I	F	F	A	X	3	T	89	32	I	F	F	A

P1) Max. working pressure - P3) Max. peak pressure
For heavy-duty applications, it is recommended to check the admissible torque of the shaft

Dimensions table

TYPE	Weight	A	B	D	D
	kg	mm	mm	IN	OUT
X3T/15	7,010	122,0	61,0	3/4"" BSPP	3/4"" BSPP
X3T/18	7,070	124,0	62,0	3/4"" BSPP	3/4"" BSPP
X3T/21	7,150	127,0	63,5	3/4"" BSPP	3/4"" BSPP
X3T/27	7,250	131,0	65,5	1"" BSPP	1"" BSPP
X3T/32	7,390	136,0	68,0	1"" BSPP	1"" BSPP
X3T/38	7,520	141,0	70,5	1"" BSPP	1"" BSPP
X3T/43	7,630	145,0	72,5	1"" BSPP	1"" BSPP
X3T/47	7,710	148,0	74,0	1"" BSPP	1"" BSPP
X3T/51	7,790	151,0	75,5	1"" BSPP	1"" BSPP
X3T/54	7,870	154,0	77,0	1"" BSPP	1"" BSPP
X3T/61	8,010	159,0	79,5	1"" 1/4 BSPP	1"" 1/4 BSPP
X3T/64	8,090	162,0	81,0	1"" 1/4 BSPP	1"" 1/4 BSPP
X3T/70	8,220	167,0	83,5	1"" 1/4 BSPP	1"" 1/4 BSPP
X3T/74	8,300	170,0	85,0	1"" 1/4 BSPP	1"" 1/4 BSPP
X3T/90	8,570	180,0	90,0	1"" 1/4 BSPP	1"" 1/4 BSPP

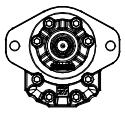


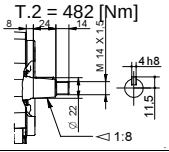
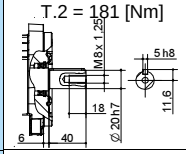
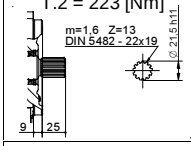
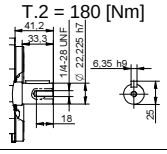
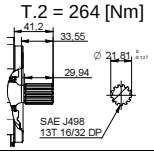
T.1 = 60÷65 [Nm] - screw tightening torque M10
T.2 = 264 [Nm] - admissible shaft torque (N.B. When choosing a shaft, always check the admissible torque).

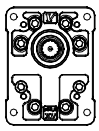
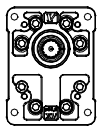
Table of variations

ø101.6 FLANGE ""SAE B""

X3T

ø101.6 FLANGE ""SAE B""			
Left rotation		Right rotation	
	31		32

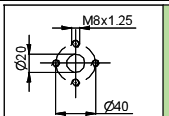
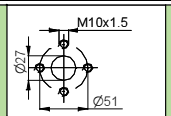
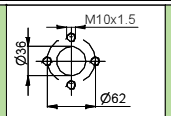
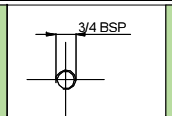
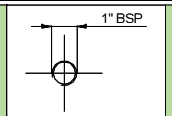
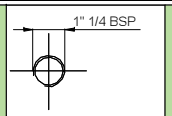
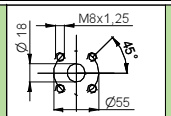
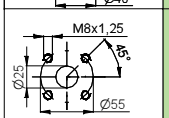
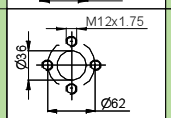
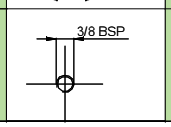
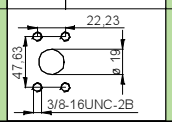
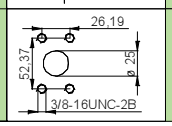
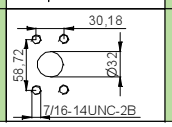
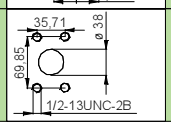
Shaft			
COP01 - Tapered T.2 = 482 [Nm]	A	CIP01 - Parallel T.2 = 181 [Nm]	B
			
SCP03 - Splined T.2 = 223 [Nm]	C	CIP04 - Parallel T.2 = 180 [Nm]	H
			
SCP04 - Splined T.2 = 264 [Nm]	I		
			

Cover		
Left rotation	Right rotation	
		A

Displacement	
TYPE	CODE
X3T/15	**66**
X3T/18	**68**
X3T/21	**70**
X3T/27	**72**
X3T/32	**74**
X3T/38	**78**
X3T/43	**79**
X3T/47	**80**
X3T/51	**81**
X3T/54	**82**
X3T/61	**83**
X3T/64	**85**
X3T/70	**86**
X3T/74	**87**
X3T/90	**89**

Standard bodies			
Displacement cm3/rev	Standard threads		
15	A - A	D - D	H – H
18	A - A	D - D	H – H
21	A - A	D - D	H – H
27	A - A	E - E	H – H
32	B - B	E - E	H – H
38	B - B	E - E	H – H
43	B - B	E - E	H – H
47	B - B	E - E	H – H
51	B - B	E - E	H – H
54	B - B	E - E	H – H
61	C - C	F - F	
64	C - C	F - F	
70	C - C	F - F	
74	C - C	F - F	
90	C - C	F - F	

Table showing standard flange and thread combinations available in stock

Body (threads/flanges)																					
	A		B		C		D		E		F		G
	H		I		L		M		N		O		P
Closed Body	Z																				

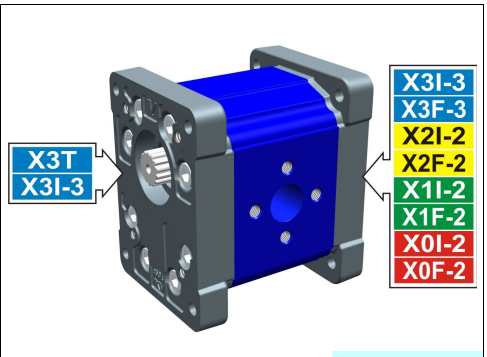
intermediate pump - series XV

STANDARD INTERMEDIATE PUMP
ø50.8 FLANGE - TAPER SHAFT

X3I-3

X	3	I	78	02	D	B	B	A

Series	X	series XV
Group	3	group 3
Category	I	intermediate pump
Displacement	78	38
Flange	02	Ø50.8 female right rotation
Shaft	D	SCI01 - Splined ø24.5 - z=14 H=18 m=1.6 - DIN5482 25x22
Body IN	B	inlet - Ø51 Ø27 M10
Body OUT	B	outlet - Ø51 Ø27 M10
Cover	A	ø50,8 female cover for left multiple pump element

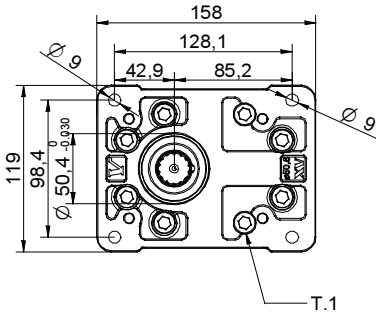


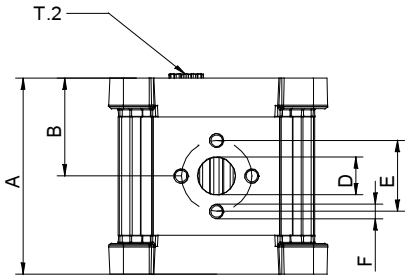
XI301

Technical data table

TYPE	Displacement	Max. Pressure		CODE	
	cm3/rev	P1 bar	P3 bar	Left rotation	Right rotation
X3I-3/15	14,89	300	320	X 3 I 66 01 D A A A	X 3 I 66 02 D A A A
X3I-3/18	17,37	300	320	X 3 I 68 01 D A A A	X 3 I 68 02 D A A A
X3I-3/21	21,10	280	300	X 3 I 70 01 D A A A	X 3 I 70 02 D A A A
X3I-3/27	26,97	250	270	X 3 I 72 01 D A A A	X 3 I 72 02 D A A A
X3I-3/32	32,27	250	270	X 3 I 74 01 D B B A	X 3 I 74 02 D B B A
X3I-3/38	38,47	250	270	X 3 I 78 01 D B B A	X 3 I 78 02 D B B A
X3I-3/43	43,44	250	270	X 3 I 79 01 D B B A	X 3 I 79 02 D B B A
X3I-3/47	47,16	230	250	X 3 I 80 01 D B B A	X 3 I 80 02 D B B A
X3I-3/51	50,88	230	250	X 3 I 81 01 D B B A	X 3 I 81 02 D B B A
X3I-3/54	54,60	230	250	X 3 I 82 01 D B B A	X 3 I 82 02 D B B A
X3I-3/61	60,81	230	250	X 3 I 83 01 D C C A	X 3 I 83 02 D C C A
X3I-3/64	64,53	210	230	X 3 I 85 01 D C C A	X 3 I 85 02 D C C A
X3I-3/70	70,74	200	220	X 3 I 86 01 D C C A	X 3 I 86 02 D C C A
X3I-3/74	74,46	180	200	X 3 I 87 01 D C C A	X 3 I 87 02 D C C A
X3I-3/90	86,87	150	170	X 3 I 89 01 D C C A	X 3 I 89 02 D C C A

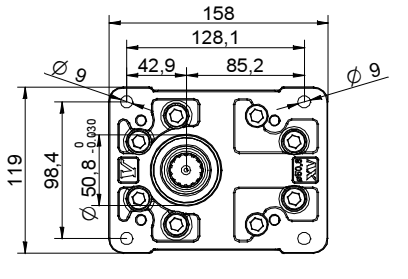
P1) Max. working pressure - P3) Max. peak pressure
For heavy-duty applications, it is recommended to check the admissible torque of the shaft





Dimensions table

TYPE	Weight	A	B	D	E	F	D	E	F
	kg	mm	mm	IN			OUT		
X3I-3/15	7,010	122,0	61,0	ø20	40	M8	ø20	40	M8
X3I-3/18	7,070	124,0	62,0	ø20	40	M8	ø20	40	M8
X3I-3/21	7,150	127,0	63,5	ø20	40	M8	ø20	40	M8
X3I-3/27	7,250	131,0	65,5	ø20	40	M8	ø20	40	M8
X3I-3/32	7,390	136,0	68,0	ø27	51	M10	ø27	51	M10
X3I-3/38	7,520	141,0	70,5	ø27	51	M10	ø27	51	M10
X3I-3/43	7,630	145,0	72,5	ø27	51	M10	ø27	51	M10
X3I-3/47	7,710	148,0	74,0	ø27	51	M10	ø27	51	M10
X3I-3/51	7,790	151,0	75,5	ø27	51	M10	ø27	51	M10
X3I-3/54	7,870	154,0	77,0	ø27	51	M10	ø27	51	M10
X3I-3/61	8,010	159,0	79,5	ø36	62	M10	ø36	62	M10
X3I-3/64	8,090	162,0	81,0	ø36	62	M10	ø36	62	M10
X3I-3/70	8,220	167,0	83,5	ø36	62	M10	ø36	62	M10
X3I-3/74	8,300	170,0	85,0	ø36	62	M10	ø36	62	M10
X3I-3/90	8,570	180,0	90,0	ø36	62	M10	ø36	62	M10



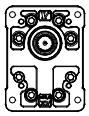
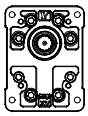
08/04/08 X3I78020BBA.dft

T.1 = 60÷65 [Nm] - screw tightening torque M10
T.2 = 332 [Nm] - admissible shaft torque (N.B. When choosing a shaft, always check the admissible torque).

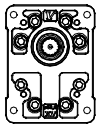
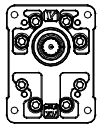
Table of variations

Female ø50.8 FLANGE

X3I-3

Female ø50.8 FLANGE			
Left rotation		Right rotation	
	01		02

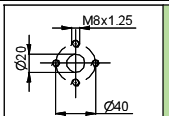
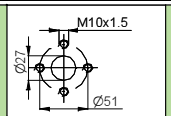
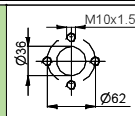
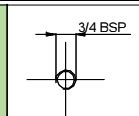
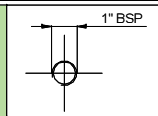
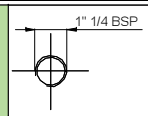
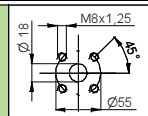
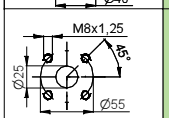
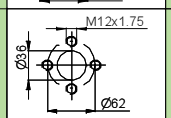
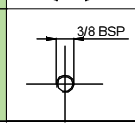
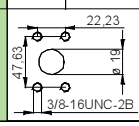
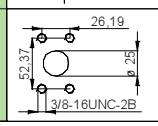
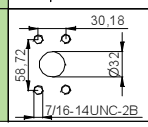
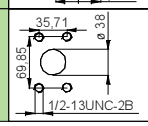
Shaft	
SCI01 - Splined T.2 = 332 [Nm] m=1,6 Z=14 DIN 5482 - 25x22 Ø24.5h11	D

Cover		
Left rotation	Right rotation	
		A

Displacement	
TYPE	CODE
X3I-3/15	**66**
X3I-3/18	**68**
X3I-3/21	**70**
X3I-3/27	**72**
X3I-3/32	**74**
X3I-3/38	**78**
X3I-3/43	**79**
X3I-3/47	**80**
X3I-3/51	**81**
X3I-3/54	**82**
X3I-3/61	**83**
X3I-3/64	**85**
X3I-3/70	**86**
X3I-3/74	**87**
X3I-3/90	**89**

Standard bodies			
Displacement cm3/rev	Standard threads		
15	A - A	D - D	H – H
18	A - A	D - D	H – H
21	A - A	D - D	H – H
27	A - A	E - E	H – H
32	B - B	E - E	H – H
38	B - B	E - E	H – H
43	B - B	E - E	H – H
47	B - B	E - E	H – H
51	B - B	E - E	H – H
54	B - B	E - E	H – H
61	C - C	F - F	
64	C - C	F - F	
70	C - C	F - F	
74	C - C	F - F	
90	C - C	F - F	

Table showing standard flange and thread combinations available in stock

Body (threads/flanges)																				
	A		B		C		D		E		F		G
	H		I		L		M		N		O		P
Closed Body	Z																			

final pump - series XV

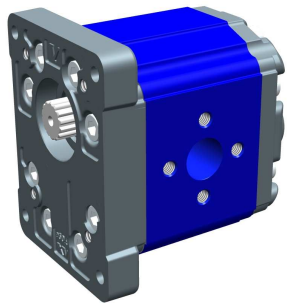
STANDARD FINAL PUMP
ø50.8 FLANGE - TAPER SHAFT

X3F-3

X	3	F	78	02	D	B	B	A

Series		X	series XV
Group		3	group 3
Category		F	final pump
Displacement		78	38
Flange		02	Ø50.8 female right rotation
Shaft		D	SCF01 - Splined ø24.5 - z=14 H=18 m=1.6 - DIN5482 25x22
Body	IN	B	inlet - Ø51 Ø27 M10
	OUT	B	outlet - Ø51 Ø27 M10
Cover		A	standard

X3T
X3I-3

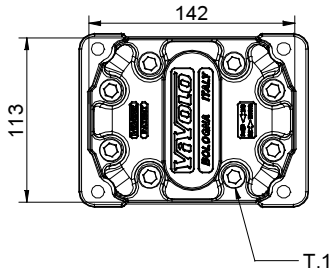


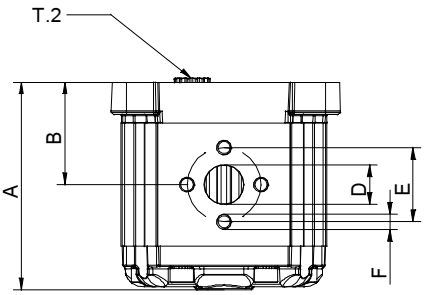
XF301

Technical data table

TYPE	Displacement	Max. Pressure		CODE															
	cm3/rev	P1 bar	P3 bar	Left rotation									Right rotation						
X3F-3/15	14,89	300	320	X	3	F	66	01	D	A	A	A	X	3	F	66	02	D	A	A	A
X3F-3/18	17,37	300	320	X	3	F	68	01	D	A	A	A	X	3	F	68	02	D	A	A	A
X3F-3/21	21,10	280	300	X	3	F	70	01	D	A	A	A	X	3	F	70	02	D	A	A	A
X3F-3/27	26,97	250	270	X	3	F	72	01	D	A	A	A	X	3	F	72	02	D	A	A	A
X3F-3/32	32,27	250	270	X	3	F	74	01	D	B	B	A	X	3	F	74	02	D	B	B	A
X3F-3/38	38,47	250	270	X	3	F	78	01	D	B	B	A	X	3	F	78	02	D	B	B	A
X3F-3/43	43,44	250	270	X	3	F	79	01	D	B	B	A	X	3	F	79	02	D	B	B	A
X3F-3/47	47,16	230	250	X	3	F	80	01	D	B	B	A	X	3	F	80	02	D	B	B	A
X3F-3/51	50,88	230	250	X	3	F	81	01	D	B	B	A	X	3	F	81	02	D	B	B	A
X3F-3/54	54,60	230	250	X	3	F	82	01	D	B	B	A	X	3	F	82	02	D	B	B	A
X3F-3/61	60,81	230	250	X	3	F	83	01	D	C	C	A	X	3	F	83	02	D	C	C	A
X3F-3/64	64,53	210	230	X	3	F	85	01	D	C	C	A	X	3	F	85	02	D	C	C	A
X3F-3/70	70,74	200	220	X	3	F	86	01	D	C	C	A	X	3	F	86	02	D	C	C	A
X3F-3/74	74,46	180	200	X	3	F	87	01	D	C	C	A	X	3	F	87	02	D	C	C	A
X3F-3/90	86,87	150	170	X	3	F	89	01	D	C	C	A	X	3	F	89	02	D	C	C	A

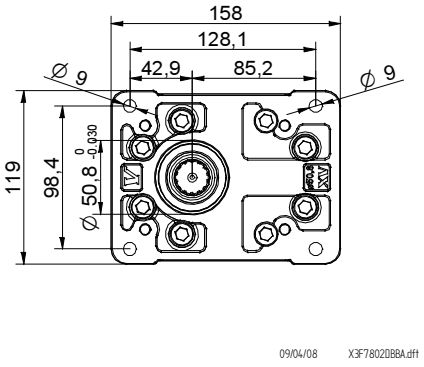
P1) Max. working pressure - P3) Max. peak pressure
For heavy-duty applications, it is recommended to check the admissible torque of the shaft





Dimensions table

TYPE	Weight	A	B	D	E	F	D	E	F
	kg	mm	mm	IN			OUT		
X3F-3/15	7,010	124,0	61,0	ø20	40	M8	ø20	40	M8
X3F-3/18	7,070	126,0	62,0	ø20	40	M8	ø20	40	M8
X3F-3/21	7,150	129,0	63,5	ø20	40	M8	ø20	40	M8
X3F-3/27	7,250	133,0	65,5	ø20	40	M8	ø20	40	M8
X3F-3/32	7,390	138,0	68,0	ø27	51	M10	ø27	51	M10
X3F-3/38	7,520	143,0	70,5	ø27	51	M10	ø27	51	M10
X3F-3/43	7,630	147,0	72,5	ø27	51	M10	ø27	51	M10
X3F-3/47	7,710	150,0	74,0	ø27	51	M10	ø27	51	M10
X3F-3/51	7,790	153,0	75,5	ø27	51	M10	ø27	51	M10
X3F-3/54	7,870	156,0	77,0	ø27	51	M10	ø27	51	M10
X3F-3/61	8,010	161,0	79,5	ø36	62	M10	ø36	62	M10
X3F-3/64	8,090	164,0	81,0	ø36	62	M10	ø36	62	M10
X3F-3/70	8,220	169,0	83,5	ø36	62	M10	ø36	62	M10
X3F-3/74	8,300	172,0	85,0	ø36	62	M10	ø36	62	M10
X3F-3/90	8,570	182,0	90,0	ø36	62	M10	ø36	62	M10



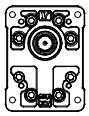
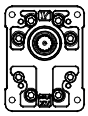
09/04/08 X3F7802DBBA.dft

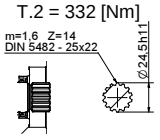
T.1 = 60÷65 [Nm] - screw tightening torque M10
T.2 = 332 [Nm] - admissible shaft torque (N.B. When choosing a shaft, always check the admissible torque).

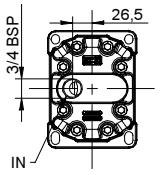
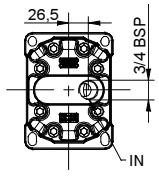
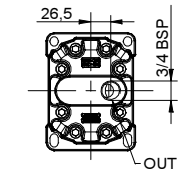
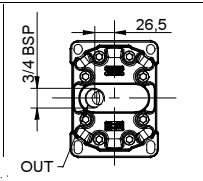
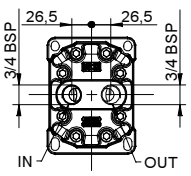
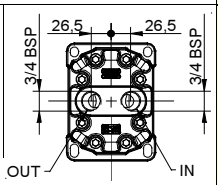
Table of variations

Female ø50.8 FLANGE

X3F-3

Female ø50.8 FLANGE			
Left rotation		Right rotation	
	01		02

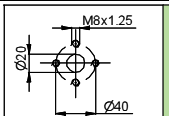
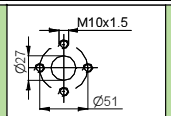
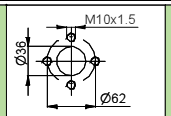
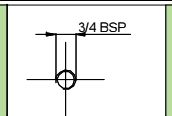
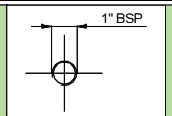
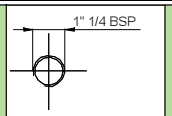
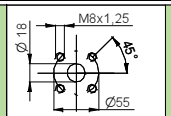
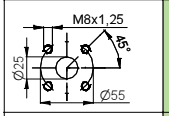
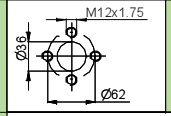
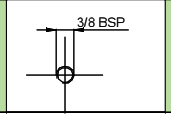
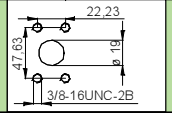
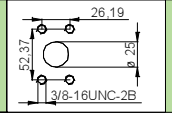
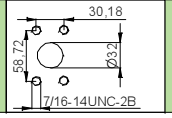
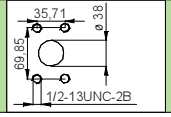
Shaft	
SCF01 - Splined T.2 = 332 [Nm] 	D

Cover		
Left rotation	Right rotation	
		A
		B
		C
		D

Displacement	
TYPE	CODE
X3F-3/15	**66**
X3F-3/18	**68**
X3F-3/21	**70**
X3F-3/27	**72**
X3F-3/32	**74**
X3F-3/38	**78**
X3F-3/43	**79**
X3F-3/47	**80**
X3F-3/51	**81**
X3F-3/54	**82**
X3F-3/61	**83**
X3F-3/64	**85**
X3F-3/70	**86**
X3F-3/74	**87**
X3F-3/90	**89**

Standard bodies			
Displacement cm3/rev	Standard threads		
15	A - A	D - D	H – H
18	A - A	D - D	H – H
21	A - A	D - D	H – H
27	A - A	E - E	H – H
32	B - B	E - E	H – H
38	B - B	E - E	H – H
43	B - B	E - E	H – H
47	B - B	E - E	H – H
51	B - B	E - E	H – H
54	B - B	E - E	H – H
61	C - C	F - F	
64	C - C	F - F	
70	C - C	F - F	
74	C - C	F - F	
90	C - C	F - F	

Table showing standard flange and thread combinations available in stock

Body (threads/flanges)																					
	A		B		C		D		E		F		G
	H		I		L		M		N		O		P
Closed Body	Z																				

SAMT HYDRAULICS

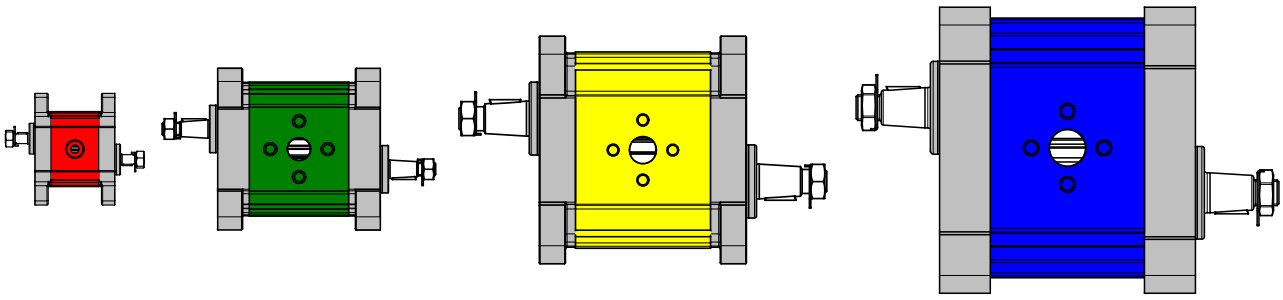
APPENDIX - SPECIAL VERSIONS

DOUBLE SHAFT - Variant **VA**

All versions may be supplied with a double shaft using all types of shafts and flanges As per catalogue

Example of order code

Standard ----------X0P0602ABBA
With double shaft ----------X0P0602ABBA **VA**



XV-0 **XV-1** **XV-2** **XV-3**

SEALS made of FKM (viton) variant **VITON**

All versions may be supplied with **FKM (viton)** seals

Example of order code

Standard----------X0P0602ABBA
With FKM (viton) seals -----X0P0602ABBA **VITON**

O-RINGS

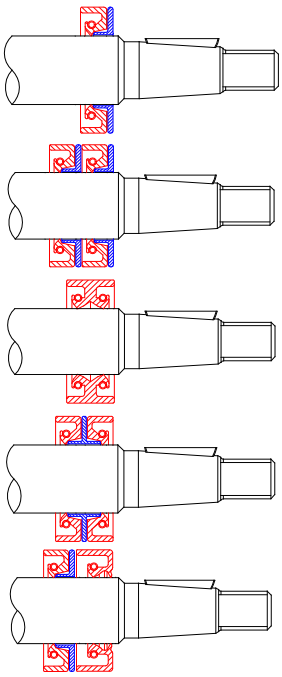
Variant **VDC** — Oil seal with backup washer (standard for motors)

Variant **VDCX** — Double oil seal with double backup washer

Variant **VDB** — DUPLEX oil seal

Variant **VDBX** — Double opposed oil seal with backup washer

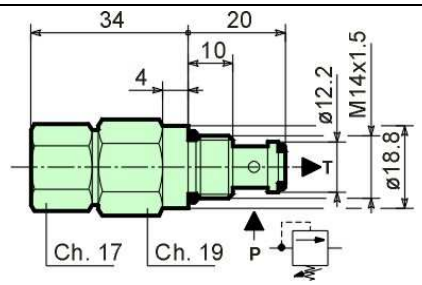
Variant **VDCO** — Motor Oil Seal with backup washer + Standard Oil Seal



Example of order code
Standard----------X1P0602FIIA
With oil seal and retaining washer -----X1P0602FIIA **VDC**

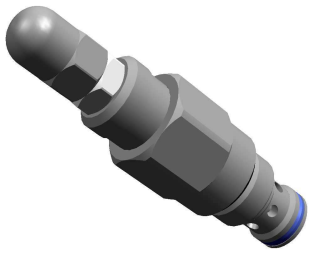
MAX. PRESSURE VALVES

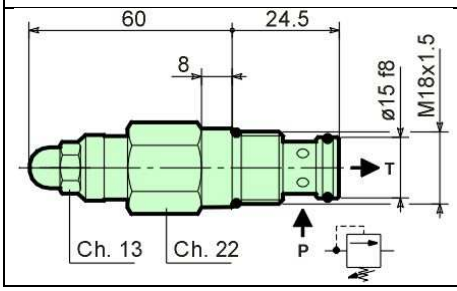
Pressure-relief valve VM25 for XV0 series



Technical specifications	
Capacity	25 l/min
Max pressure in P	315 bars
Max pressure in T	315 bars
Setting range of spring **Type 01**	20-140 bars
Setting range of spring **Type 02**	70-315 bars
Required filtration	10-15 µm
Oil viscosity range	2.8-350 cSt
Recommended oil temperature	-20 + 80 ℃
Seal material	Buna N
Weight	0.110 kg
Pressures with flow of 1 l/min: opening value in relation to setting	95%
Closing value in relation to setting	75%
Hydraulic oil	HM, HV ISO 6074

Pressure-relief valve VM50 for XV1 and XV2 series

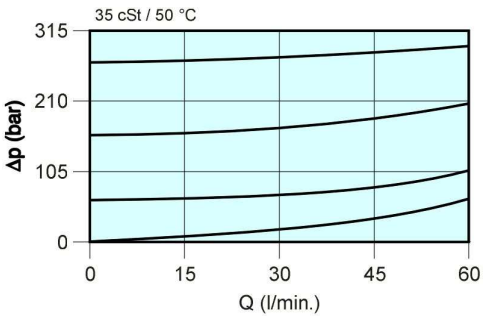




Technical specifications	
Capacity	50/min
Max pressure in P	350 bars
Max pressure in T	350 bars
Setting range of spring **Type 01**	10-105 bars
Setting range of spring **Type 02**	70-210 bars
Setting range of spring **Type 03**	140-350 bars
Required filtration	10-15 µm
Oil viscosity range	2.8-350 cSt
Recommended oil temperature	-20 + 80 ℃
Seal material	Buna N
Weight	0.125 kg
Pressures with flow of 1 l/min: opening value in relation to setting	95%
Closing value in relation to setting	75%
Hydraulic oil	HM, HV ISO 6074

Standard test settings

TYPE	**Pressure** (bars)	**Capacity** (l/min)	**Pressure increase** (bars x turn of screw)
1 (10-105 bars)	50	5	15
2 (70-210 bars)	130	5	32
3 (140-350 bars)	200	5	67

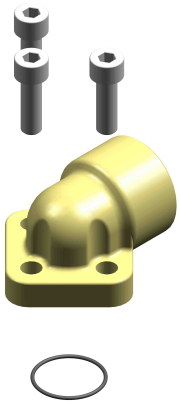


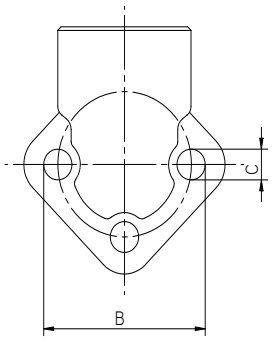
Performance of VM25 and VM50 valves

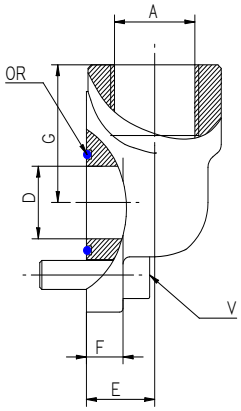
Δp= Pressure drop in bars
Q = Capacity in litres per minute

90° STEEL ELBOWS

Code	Type	A	B	C	D	E	F	G	OR O ring	V Screw	weigth
8KRG001	RG 26/12-3/8"BSP	3/8"	26	5,5	12	18	9,5	27	ø14,00x1,78	M5x18	0,13
8KRG002	RG 26/12-1/2"BSP	1/2"	26	5,5	12	18	9,5	27	ø14,00x1,78	M5x18	0,12
8KRG003	RG 30/13,5 -3/8"BSP	3/8"	30	6,5	13,5	18	9,5	27	ø15,88x2,62	M6x20	0,17
8KRG004	RG 30/13,5 -1/2"BSP	1/2"	30	6,5	13,5	18	9,5	27	ø15,88x2,62	M6x20	0,16
8KRG005	RG 40/20-1/2"BSP	1/2"	40	8,5	20	21	10,5	38	ø23,81x2,62	M8x25	0,36
8KRG006	RG 40/20-3/4"BSP	3/4"	40	8,5	20	21	10,5	38	ø23,81x2,62	M8x25	0,32
8KRG007	RG 40/23-3/4"BSP	3/4"	40	8,5	23,5	21	10,5	38	ø25,12x1,78	M8x25	0,29
8KRG008	RG 51/27-1"BSP	1"	51	10,5	27	27	13,5	47	ø31,42x2,62	M10x30	0,7
8KRG009	RG 51/27-3/4" BSP	3/4"	51	10,5	27	27	13,5	47	ø31,42x2,62	M10x30	0,7
8KRG011	RG 56/34-3/4" BSP	3/4"	56	10,5	34	27	13,5	47	ø37,77x2,62	M10x30	0,72
8KRG012	RG 62/36-1"1/4 BSP	1"1/4	62	10,5	36	36	19	56	ø41,28x3,53	M10x30	0,94
8KRG015	RG 62/36-1"1/4 BSP M12	1"1/4	62	12,5	36	36	19	56	ø41,28x3,53	M12x35	0,94
8KRG013	RG 72,5/45-1"1/2 BSP	1"1/2	72,5	12,5	45	38	16	58	ø49,20x3,53	M12x35	1,23
8KRG014	RG 92/65-2" BSP	2	92	12,5	65	50	21	75	ø69,85x3,53	M12x40	1,65

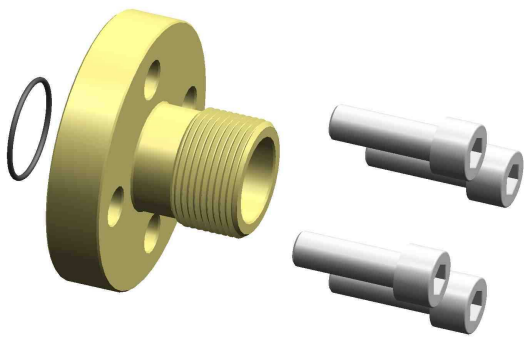


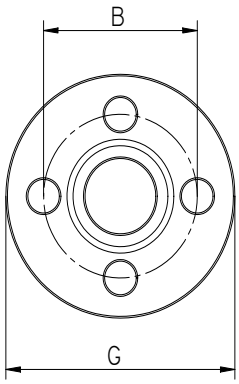


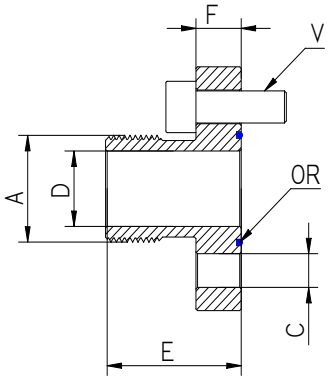


STRAIGHT STEEL UNIONS

Code	Type	A	B	C	D	E	F	G	OR O ring	V Screw	Weigth
8KRD001	RD 26/12-3/8"BSP	3/8"	26	5,5	12	32	10	39	ø14,00x1,78	M5x18	0,11
8KRD002	RD 30/13,5-1/2"BSP	1/2"	30	6,5	13,5	40	10	44	ø15,88x2,62	M6x20	0,14
8KRD005	RD 40/20-3/4"BSP	3/4"	40	8,5	20	42	12	51	ø23,81x2,62	M8x25	0,3
8KRD006	RD 40/23,5-3/4"BSP	3/4"	40	8,5	23,5	42	12	51	ø25,12x1,78	M8x25	0,29
8KRD007	RD 51/27-1"BSP	1"	51	10,5	27	43	12	68	ø31,42x2,62	M10x25	0,46
8KRD008	RD 56/34-1"1/4 BSP	1" 1/4	56	10,5	34	53	12	73	ø37,77x2,62	M10x25	0,68
8KRD009	RD 62/36-1"1/4 BSP	1" 1/4	62	10,5	36	47	13	78	ø41,28x3,53	M10x25	0,9
8KRD010	RD 72,5/45-1"1/2 BSP	1" 1/2	72,5	12,5	45	49	14	89	ø49,20x3,53	M12x30	1,05
8KRD011	RD 92/65-2"1/2 BSP	2" 1/2	92	12,5	65	60	18	114	ø69,85x3,53	M12x40	1,15

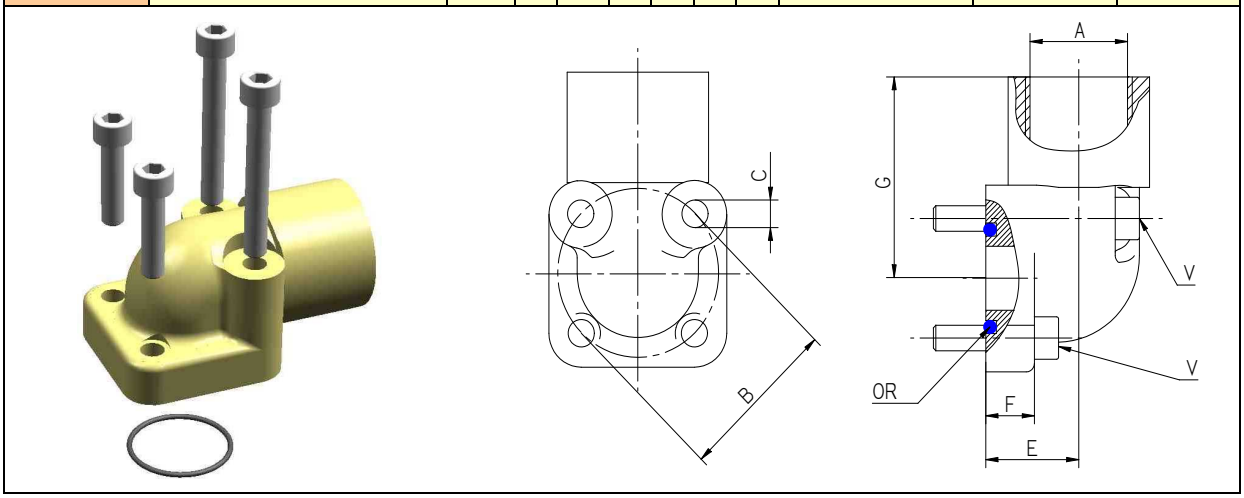






SQUARED STEEL ELBOWS

Code	Type	A	B	C	D	E	F	G	OR O ring	V Screw	Weight
8KRQ001	RQ 30/12-3/8"BSP	3/8"	30	6,5	12	19	11	41	ø15,88x2,61	N°2 M6x20 N°2 M6x35	0,29
8KRQ002	RQ 30/12-1/2"BSP	1/2"	30	6,5	12	19	11	41	ø15,88x2,62	N°2 M6x20 N°2 M6x35	0,29
8KRQ003	RQ 35/15 -3/8"BSP	3/8"	35	6,5	15	18	11	40	ø18,72x2,62	N°2 M6x20 N°2 M6x35	0,34
8KRQ004	RQ 35/15 -1/2"BSP	1/2"	35	6,5	15	18	11	40	ø18,72x2,62	N°2 M6x20 N°2 M6x35	0,34
8KRQ005	RQ 40/20-1/2"BSP	1/2"	40	6,5	20	24	10	45	ø22,22x2,62	N°2 M6x25 N°2 M6x45	0,4
8KRQ006	RQ 40/20-3/4"BSP	3/4"	40	6,5	20	24	10	45	ø22,22x2,62	N°2 M6x25 N°2 M6x45	0,4
8KRQ007	RQ 55/25-3/4"BSP	3/4"	55	8,5	25	35	13	54	ø29,75x3,53	N°2 M8x25 N°2 M8x60	0,45
8KRQ008	RQ 55/25-1" BSP	1"	55	8,5	25	35	13	54	ø29,75x3,53	N°2 M8x25 N°2 M8x60	0,45



STRAIGHT STEEL UNIONS

Code	Type	A	B	C	D	E	F	G	OR O ring	V Screw	Weigth
8KRD003	RD 35/15 (BH)-1/2"BSP	1/2"	35	6,5	14	35	10	40	ø18,72x2,62	M6x20	0,15
8KRD004	RD 40/20 (BH)-3/4"BSP	3/4"	40	6,5	17	35	10	40	ø22,22x2,62	M6x20	0,17

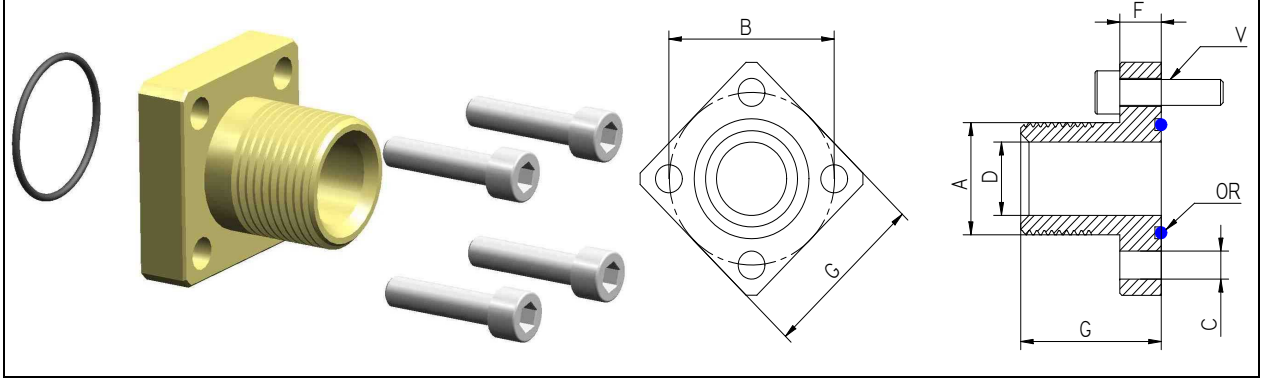
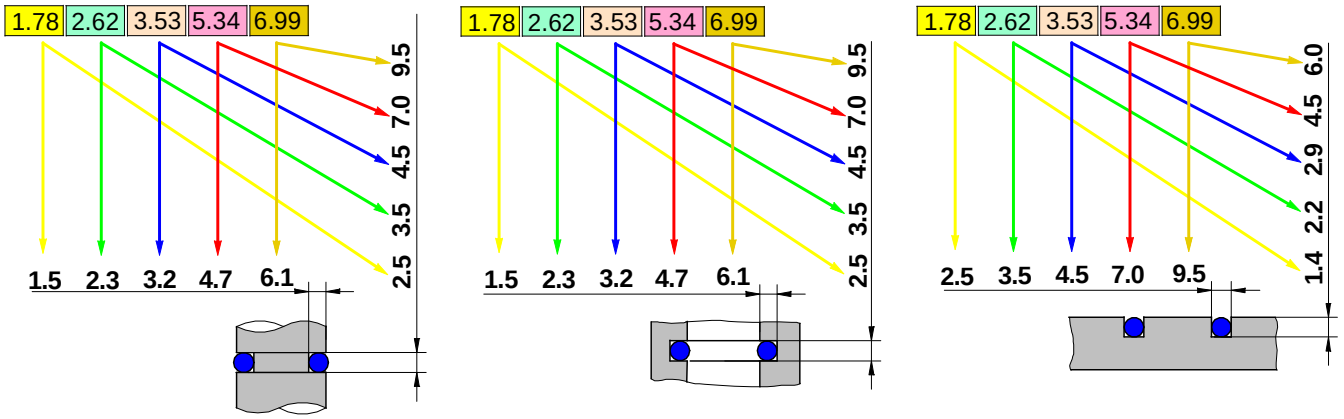
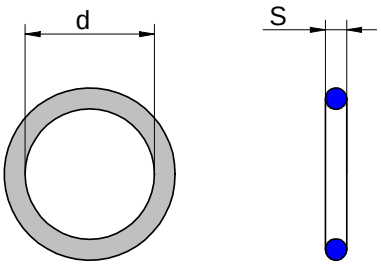


Table of seals OR





S=1,78		S=2,62				S=3,53				S=5,34				S=6,99		
1,78	33,05	9,13	34,60	82,22	247,33	18,64	52,39	88,50	190,1	37,43	107,2	158,12	481,46	113,7	181,0	342,3
2,57	34,65	9,19	36,14	88,57		20,22	53,37	91,67	196,4	40,65	109,5	164,47	506,86	114,7	183,5	354,9
2,90	37,82	9,92	37,77	94,92		21,82	53,98	94,84	202,8	43,82	110,5	170,82	532,26	116,8	187,3	367,7
3,68	41,00	10,78	39,34	101,27		23,40	55,56	98,02	209,1	47,00	113,7	117,17	557,66	120,0	189,9	380,3
4,47	44,17	11,91	40,95	107,63		24,99	56,74	101,2	215,5	50,16	116,84	183,52	582,68	123,2	193,7	393,1
5,28	47,35	12,37	42,52	113,98		25,80	57,15	104,4	221,8	53,34	117,5	189,87	608,08	124,6	196,2	
6,07	50,52	13,10	44,12	120,33		26,58	58,74	107,5	228,2	56,52	120,02	196,22	633,48	126,4	200,0	
6,75	53,70	13,95	45,69	126,67		28,17	59,92	110,7	234,5	59,69	120,7	202,57	658,88	129,5	202,6	
7,65	56,87	15,08	47,30	133,00		29,75	60,33	113,9	240,9	62,87	123,2	208,92		132,7	208,9	
8,73	60,05	15,54	48,99	139,38		31,34	61,91	117,1	247,2	66,04	123,8	215,27		134,5	215,3	
9,25	63,22	15,88	50,47	145,73		32,93	63,09	120,2	253,6	69,22	126,37	221,62		135,9	221,6	
10,82	66,40	17,13	52,07	152,07		34,52	63,50	123,4	266,3	72,39	127,0	227,97		139,1	227,9	
11,11	69,57	17,86	53,65	158,43		36,10	56,09	126,6	279,0	74,63	129,54	234,32		142,2	234,3	
12,42	72,75	18,72	55,25	164,78		37,89	66,27	129,8	291,7	75,57	130,2	240,67		145,4	240,7	
14,00	75,92	20,29	56,82	171,13		39,69	66,68	132,9	304,4	78,74	132,72	247,02		148,6	247,0	
15,60	82,27	20,63	58,42	177,48		40,89	68,26	136,1	329,8	79,77	133,4	253,37		151,8	253,3	
17,17	88,62	21,89	60,00	183,83		41,28	69,44	139,3	355,2	81,92	135,9	266,07		155,6	259,7	
18,77	94,97	22,22	61,60	190,18		42,86	69,85	142,5	380,6	85,09	136,5	278,77		158,1	266,1	
20,35	101,32	23,47	63,17	196,53		44,04	71,44	145,6	405,2	88,27	139,07	291,5		159,5	272,4	
31,95	107,67	23,81	64,77	202,88		44,45	72,62	148,8	430,6	89,69	139,7	304,17		161,9	278,7	
23,52	114,02	25,07	66,35	209,23		46,04	73,03	152,0	456,0	91,44	142,9	329,57		164,5	285,1	
25,12	120,37	26,65	67,95	215,58		47,22	74,61	158,3		94,62	145,42	354,97		166,7	291,5	
26,70	126,72	28,25	69,52	221,93		47,63	75,80	164,7		97,79	146,1	380,37		168,3	297,8	
28,30	133,07	29,82	71,12	228,28		49,21	78,97	171,0		100,0	148,6	405,26		170,8	304,1	
29,87		31,42	72,69	234,63		50,39	82,14	177,4		101,0	149,2	430,66		174,6	316,9	
31,47		32,99	75,87	240,98		50,80	85,32	183,7		104,1	151,77	456,06		177,2	329,6	

Table of oil speeds

Speed m/sec		Capacities - l/min																			
		5	10	15	20	25	30	35	40	45	50	55	60	65	70	75	80	85	90	95	100
Inlet	0,5	14,6	20,6	25,2	29,1	32,6	35,7	38,5	41,2	43,7	46,0	48,3	50,4	52,5	54,5	56,4	58,2	60,0	61,8	63,5	65,1
	1,0	10,3	14,6	17,8	20,6	23,0	25,2	27,2	29,1	30,9	32,6	34,1	35,7	37,1	38,5	39,9	41,2	42,4	43,7	44,9	46,0
	1,3	9,2	13,0	15,9	18,4	20,6	22,6	24,4	26,0	27,6	29,1	30,5	31,9	33,2	34,5	35,7	36,8	38,0	39,1	40,1	41,2
	1,5	8,4	11,9	14,6	16,8	18,8	20,6	22,2	23,8	25,2	26,6	27,9	29,1	30,3	31,5	32,6	33,6	34,7	35,7	36,6	37,6
Return	1,8	7,8	11,0	13,5	15,6	17,4	19,1	20,6	22,0	23,3	24,6	25,8	27,0	28,1	29,1	30,1	31,1	32,1	33,0	33,9	34,8
	2,0	7,3	10,3	12,6	14,6	16,3	17,8	19,3	20,6	21,8	23,0	24,1	25,2	26,2	27,2	28,2	29,1	30,0	30,9	31,7	32,6
	2,5	6,5	9,2	11,3	13,0	14,6	15,9	17,2	18,4	19,5	20,6	21,6	22,6	23,5	24,4	25,2	26,0	26,8	27,6	28,4	29,1
Outlet	3,0	5,9	8,4	10,3	11,9	13,3	14,6	15,7	16,8	17,8	18,8	19,7	20,6	21,4	22,2	23,0	23,8	24,5	25,2	25,9	26,6
	3,5	5,5	7,8	9,5	11,0	12,3	13,5	14,6	15,6	16,5	17,4	18,3	19,1	19,8	20,6	21,3	22,0	22,7	23,3	24,0	24,6
	4,0	5,1	7,3	8,9	10,3	11,5	12,6	13,6	14,6	15,4	16,3	17,1	17,8	18,6	19,3	19,9	20,6	21,2	21,8	22,4	23,0
	4,5	4,9	6,9	8,4	9,7	10,9	11,9	12,8	13,7	14,6	15,3	16,1	16,8	17,5	18,2	18,8	19,4	20,0	20,6	21,2	21,7
	5,0	4,6	6,5	8,0	9,2	10,3	11,3	12,2	13,0	13,8	14,6	15,3	15,9	16,6	17,2	17,8	18,4	19,0	19,5	20,1	20,6
	5,5	4,4	6,2	7,6	8,8	9,8	10,8	11,6	12,4	13,2	13,9	14,6	15,2	15,8	16,4	17,0	17,6	18,1	18,6	19,1	19,6
	6,0	4,2	5,9	7,3	8,4	9,4	10,3	11,1	11,9	12,6	13,3	13,9	14,6	15,2	15,7	16,3	16,8	17,3	17,8	18,3	18,8
	6,5	4,0	5,7	7,0	8,1	9,0	9,9	10,7	11,4	12,1	12,8	13,4	14,0	14,6	15,1	15,6	16,2	16,7	17,1	17,6	18,1
	7,0	3,9	5,5	6,7	7,8	8,7	9,5	10,3	11,0	11,7	12,3	12,9	13,5	14,0	14,6	15,1	15,6	16,0	16,5	17,0	17,4
	7,5	3,8	5,3	6,5	7,5	8,4	9,2	9,9	10,6	11,3	11,9	12,5	13,0	13,6	14,1	14,6	15,0	15,5	15,9	16,4	16,8
	8,0	3,6	5,1	6,3	7,3	8,1	8,9	9,6	10,3	10,9	11,5	12,1	12,6	13,1	13,6	14,1	14,6	15,0	15,4	15,9	16,3
	8,5	3,5	5,0	6,1	7,1	7,9	8,7	9,3	10,0	10,6	11,2	11,7	12,2	12,7	13,2	13,7	14,1	14,6	15,0	15,4	15,8
	9,0	3,4	4,9	5,9	6,9	7,7	8,4	9,1	9,7	10,3	10,9	11,4	11,9	12,4	12,8	13,3	13,7	14,1	14,6	15,0	15,3
	9,5	3,3	4,7	5,8	6,7	7,5	8,2	8,8	9,4	10,0	10,6	11,1	11,6	12,0	12,5	12,9	13,4	13,8	14,2	14,6	14,9
	10,0	3,3	4,6	5,6	6,5	7,3	8,0	8,6	9,2	9,8	10,3	10,8	11,3	11,7	12,2	12,6	13,0	13,4	13,8	14,2	14,6
Speed m/sec		Inner pipe diameter - mm																			

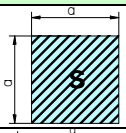
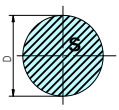
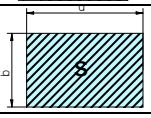
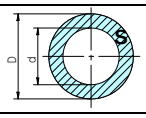
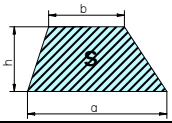
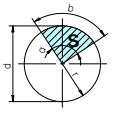
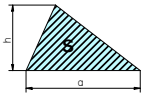
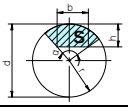
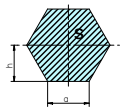
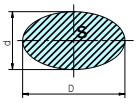
Speed m/sec		Capacities - l/min																			
		110	120	130	140	150	160	170	180	190	200	210	220	230	240	250	260	270	280	290	300
Inlet	0,5	68,3	71,3	74,2	77,0	79,7	82,4	84,9	87,4	89,8	92,1	94,4	96,6	98,8	100,9	103,0	105,0	107,0	109,0	110,9	112,8
	1,0	48,3	50,4	52,5	54,5	56,4	58,2	60,0	61,8	63,5	65,1	66,7	68,3	69,8	71,3	72,8	74,2	75,7	77,0	78,4	79,7
	1,3	43,2	45,1	47,0	48,7	50,4	52,1	53,7	55,3	56,8	58,2	59,7	61,1	62,5	63,8	65,1	66,4	67,7	68,9	70,1	71,3
	1,5	39,4	41,2	42,9	44,5	46,0	47,6	49,0	50,4	51,8	53,2	54,5	55,8	57,0	58,2	59,4	60,6	61,8	62,9	64,0	65,1
Return	1,8	36,5	38,1	39,7	41,2	42,6	44,0	45,4	46,7	48,0	49,2	50,4	51,6	52,8	53,9	55,0	56,1	57,2	58,2	59,3	60,3
	2,0	34,1	35,7	37,1	38,5	39,9	41,2	42,4	43,7	44,9	46,0	47,2	48,3	49,4	50,4	51,5	52,5	53,5	54,5	55,4	56,4
	2,5	30,5	31,9	33,2	34,5	35,7	36,8	38,0	39,1	40,1	41,2	42,2	43,2	44,2	45,1	46,0	47,0	47,8	48,7	49,6	50,4
Outlet	3,0	27,9	29,1	30,3	31,5	32,6	33,6	34,7	35,7	36,6	37,6	38,5	39,4	40,3	41,2	42,0	42,9	43,7	44,5	45,3	46,0
	3,5	25,8	27,0	28,1	29,1	30,1	31,1	32,1	33,0	33,9	34,8	35,7	36,5	37,3	38,1	38,9	39,7	40,4	41,2	41,9	42,6
	4,0	24,1	25,2	26,2	27,2	28,2	29,1	30,0	30,9	31,7	32,6	33,4	34,1	34,9	35,7	36,4	37,1	37,8	38,5	39,2	39,9
	4,5	22,8	23,8	24,7	25,7	26,6	27,5	28,3	29,1	29,9	30,7	31,5	32,2	32,9	33,6	34,3	35,0	35,7	36,3	37,0	37,6
	5,0	21,6	22,6	23,5	24,4	25,2	26,0	26,8	27,6	28,4	29,1	29,8	30,5	31,2	31,9	32,6	33,2	33,8	34,5	35,1	35,7
	5,5	20,6	21,5	22,4	23,2	24,0	24,8	25,6	26,3	27,1	27,8	28,5	29,1	29,8	30,4	31,0	31,7	32,3	32,9	33,4	34,0
	6,0	19,7	20,6	21,4	22,2	23,0	23,8	24,5	25,2	25,9	26,6	27,2	27,9	28,5	29,1	29,7	30,3	30,9	31,5	32,0	32,6
	6,5	18,9	19,8	20,6	21,4	22,1	22,8	23,5	24,2	24,9	25,5	26,2	26,8	27,4	28,0	28,6	29,1	29,7	30,2	30,8	31,3
	7,0	18,3	19,1	19,8	20,6	21,3	22,0	22,7	23,3	24,0	24,6	25,2	25,8	26,4	27,0	27,5	28,1	28,6	29,1	29,6	30,1
	7,5	17,6	18,4	19,2	19,9	20,6	21,3	21,9	22,6	23,2	23,8	24,4	24,9	25,5	26,0	26,6	27,1	27,6	28,1	28,6	29,1
	8,0	17,1	17,8	18,6	19,3	19,9	20,6	21,2	21,8	22,4	23,0	23,6	24,1	24,7	25,2	25,7	26,2	26,7	27,2	27,7	28,2
	8,5	16,6	17,3	18,0	18,7	19,3	20,0	20,6	21,2	21,8	22,3	22,9	23,4	24,0	24,5	25,0	25,5	26,0	26,4	26,9	27,4
	9,0	16,1	16,8	17,5	18,2	18,8	19,4	20,0	20,6	21,2	21,7	22,2	22,8	23,3	23,8	24,3	24,7	25,2	25,7	26,1	26,6
	9,5	15,7	16,4	17,0	17,7	18,3	18,9	19,5	20,0	20,6	21,1	21,6	22,2	22,7	23,1	23,6	24,1	24,5	25,0	25,4	25,9
	10,0	15,3	15,9	16,6	17,2	17,8	18,4	19,0	19,5	20,1	20,6	21,1	21,6	22,1	22,6	23,0	23,5	23,9	24,4	24,8	25,2
Speed m/sec		Inner pipe diameter - mm																			

Table of oil speeds

Speed m/sec		Capacities - l/min																			
		320	340	360	380	400	420	440	460	480	500	520	540	560	580	600	620	640	660	680	700
Inlet	0,5	116,5	120,1	123,5	126,9	130,2	133,4	136,6	139,7	142,7	145,6	148,5	151,3	154,1	156,8	159,5	162,1	164,7	167,3	169,8	172,3
	1,0	82,4	84,9	87,4	89,8	92,1	94,4	96,6	98,8	100,9	103,0	105,0	107,0	109,0	110,9	112,8	114,6	116,5	118,3	120,1	121,8
	1,3	73,7	75,9	78,1	80,3	82,4	84,4	86,4	88,3	90,2	92,1	93,9	95,7	97,5	99,2	100,9	102,5	104,2	105,8	107,4	109,0
	1,5	67,3	69,3	71,3	73,3	75,2	77,0	78,9	80,6	82,4	84,1	85,7	87,4	89,0	90,5	92,1	93,6	95,1	96,6	98,0	99,5
Return	1,8	62,3	64,2	66,0	67,8	69,6	71,3	73,0	74,6	76,3	77,8	79,4	80,9	82,4	83,8	85,3	86,7	88,1	89,4	90,8	92,1
	2,0	58,2	60,0	61,8	63,5	65,1	66,7	68,3	69,8	71,3	72,8	74,2	75,7	77,0	78,4	79,7	81,1	82,4	83,6	84,9	86,1
	2,5	52,1	53,7	55,3	56,8	58,2	59,7	61,1	62,5	63,8	65,1	66,4	67,7	68,9	70,1	71,3	72,5	73,7	74,8	75,9	77,0
Outlet	3,0	47,6	49,0	50,4	51,8	53,2	54,5	55,8	57,0	58,2	59,4	60,6	61,8	62,9	64,0	65,1	66,2	67,3	68,3	69,3	70,3
	3,5	44,0	45,4	46,7	48,0	49,2	50,4	51,6	52,8	53,9	55,0	56,1	57,2	58,2	59,3	60,3	61,3	62,3	63,2	64,2	65,1
	4,0	41,2	42,4	43,7	44,9	46,0	47,2	48,3	49,4	50,4	51,5	52,5	53,5	54,5	55,4	56,4	57,3	58,2	59,1	60,0	60,9
	4,5	38,8	40,0	41,2	42,3	43,4	44,5	45,5	46,6	47,6	48,5	49,5	50,4	51,4	52,3	53,2	54,0	54,9	55,8	56,6	57,4
	5,0	36,8	38,0	39,1	40,1	41,2	42,2	43,2	44,2	45,1	46,0	47,0	47,8	48,7	49,6	50,4	51,3	52,1	52,9	53,7	54,5
	5,5	35,1	36,2	37,3	38,3	39,3	40,2	41,2	42,1	43,0	43,9	44,8	45,6	46,5	47,3	48,1	48,9	49,7	50,4	51,2	51,9
	6,0	33,6	34,7	35,7	36,6	37,6	38,5	39,4	40,3	41,2	42,0	42,9	43,7	44,5	45,3	46,0	46,8	47,6	48,3	49,0	49,7
	6,5	32,3	33,3	34,3	35,2	36,1	37,0	37,9	38,7	39,6	40,4	41,2	42,0	42,7	43,5	44,2	45,0	45,7	46,4	47,1	47,8
	7,0	31,1	32,1	33,0	33,9	34,8	35,7	36,5	37,3	38,1	38,9	39,7	40,4	41,2	41,9	42,6	43,3	44,0	44,7	45,4	46,0
	7,5	30,1	31,0	31,9	32,8	33,6	34,5	35,3	36,1	36,8	37,6	38,3	39,1	39,8	40,5	41,2	41,9	42,5	43,2	43,8	44,5
	8,0	29,1	30,0	30,9	31,7	32,6	33,4	34,1	34,9	35,7	36,4	37,1	37,8	38,5	39,2	39,9	40,5	41,2	41,8	42,4	43,1
	8,5	28,3	29,1	30,0	30,8	31,6	32,4	33,1	33,9	34,6	35,3	36,0	36,7	37,4	38,0	38,7	39,3	40,0	40,6	41,2	41,8
	9,0	27,5	28,3	29,1	29,9	30,7	31,5	32,2	32,9	33,6	34,3	35,0	35,7	36,3	37,0	37,6	38,2	38,8	39,4	40,0	40,6
	9,5	26,7	27,5	28,3	29,1	29,9	30,6	31,3	32,0	32,7	33,4	34,1	34,7	35,4	36,0	36,6	37,2	37,8	38,4	39,0	39,5
	10,0	26,0	26,8	27,6	28,4	29,1	29,8	30,5	31,2	31,9	32,6	33,2	33,8	34,5	35,1	35,7	36,3	36,8	37,4	38,0	38,5
Speed m/sec		Inner pipe diameter - mm																			

d = **Inner pipe diameter** [mm]	$d = \sqrt{\frac{Q \bullet 21.2}{V}} [mm]$ $\quad V = \frac{Q \bullet 21.2}{d^2} [m/\sec]$ $\quad Q = \frac{d^2 \bullet V}{21.2} [l/\min]$
Q = **Capacities** [l]	
V = **Speed** [m/sec]	

Table of Areas and Perimeters

S= Area		**S**= Area		**S**= Area	
	**S= a²** **P= a x 4**		**S= π/4 x D²** **P= π x D**
	**S= a x b** **P= 2(a + b)**		**S= π/4 x (D²-d²)**
	**S= (a + b) x h/2**		**S= π x r² x α /360°** **b= π x α x d/360°**
	**S= a x h/2**		**S=(π r²xα/360°)-(bx(r-h)/2)**
	**S= 3 x a x h**		**S= π/4 x D x d**

ViVOLO BOLOGNA - ITALY

Pressure conversion table

Mpa	bar	Kg/cm^2	PSI	bar	Mpa	Kg/cm^2	PSI	Kg/cm^2	Mpa	bar	PSI	PSI	Mpa	bar	Kg/cm^2
1	10	10,19	145,14	1	0,1	1,019	14,5	1	0,902	0,981	14,22	1	0,007	0,069	0,0703
2	20	20,38	290,28	2	0,2	2,038	29	2	1,902	1,962	28,44	2	0,014	0,138	0,1406
3	30	30,57	435,42	3	0,3	3,057	43,5	3	2,902	2,943	42,66	3	0,021	0,207	0,2109
4	40	40,76	580,56	4	0,4	4,076	58	4	3,902	3,924	56,88	4	0,028	0,276	0,2812
5	50	50,95	725,7	5	0,5	5,095	72,5	5	4,902	4,905	71,1	5	0,035	0,345	0,3515
6	60	61,14	870,84	6	0,6	6,114	87	6	5,902	5,886	85,32	6	0,042	0,414	0,4218
7	70	71,33	1016	7	0,7	7,133	101,5	7	6,902	6,867	99,54	7	0,049	0,483	0,4921
8	80	81,52	1161,1	8	0,8	8,152	116	8	7,902	7,848	113,76	8	0,056	0,552	0,5624
9	90	91,71	1306,3	9	0,9	9,171	130,5	9	8,902	8,829	127,98	9	0,063	0,621	0,6327
10	100	101,9	1451,4	10	1	10,19	145	10	9,902	9,81	142,2	10	0,07	0,69	0,703
20	200	203,8	2902,8	20	2	20,38	290	20	19,902	19,62	284,4	20	0,14	1,38	1,406
30	300	305,7	4354,2	30	3	30,57	435	30	29,902	29,43	426,6	30	0,21	2,07	2,109
40	400	407,6	5805,6	40	4	40,76	580	40	39,902	39,24	568,8	40	0,28	2,76	2,812
50	500	509,5	7257	50	5	50,95	725	50	49,902	49,05	711	50	0,35	3,45	3,515
60	600	611,4	8708,4	60	6	61,14	870	60	59,902	58,86	853,2	60	0,42	4,14	4,218
70	700	713,3	10160	70	7	71,33	1015	70	69,902	68,67	995,4	70	0,49	4,83	4,921
80	800	815,2	11611	80	8	81,52	1160	80	79,902	78,48	1137,6	80	0,56	5,52	5,624
90	900	917,1	13063	90	9	91,71	1305	90	89,902	88,29	1279,8	90	0,63	6,21	6,327
100	1000	1019	14514	100	10	101,9	1450	100	99,902	98,1	1422	100	0,7	6,9	7,03
110	1100	1120,9	15965	110	11	112,09	1595	110	109,9	107,91	1564,2	110	0,77	7,59	7,733
120	1200	1222,8	17417	120	12	122,28	1740	120	119,9	117,72	1706,4	120	0,84	8,28	8,436
130	1300	1324,7	18868	130	13	132,47	1885	130	129,9	127,53	1848,6	130	0,91	8,97	9,139
140	1400	1426,6	20320	140	14	142,66	2030	140	139,9	137,34	1990,8	140	0,98	9,66	9,842
150	1500	1528,5	21771	150	15	152,85	2175	150	149,9	147,15	2133	150	1,05	10,35	10,545
160	1600	1630,4	23222	160	16	163,04	2320	160	159,9	156,96	2275,2	160	1,12	11,04	11,248
170	1700	1732,3	24674	170	17	173,23	2465	170	169,9	166,77	2417,4	170	1,19	11,73	11,951
180	1800	1834,2	26125	180	18	183,42	2610	180	179,9	176,58	2559,6	180	1,26	12,42	12,654
190	1900	1936,1	27577	190	19	193,61	2755	190	189,9	186,39	2701,8	190	1,33	13,11	13,357
200	2000	2038	29028	200	20	203,8	2900	200	199,9	196,2	2844	200	1,4	13,8	14,06
210	2100	2139,9	30479	210	21	213,99	3045	210	209,9	206,01	2986,2	210	1,47	14,49	14,763
220	2200	2241,8	31931	220	22	224,18	3190	220	219,9	215,82	3128,4	220	1,54	15,18	15,466
230	2300	2343,7	33382	230	23	234,37	3335	230	229,9	225,63	3270,6	230	1,61	15,87	16,169
240	2400	2445,6	34834	240	24	244,56	3480	240	239,9	235,44	3412,8	240	1,68	16,56	16,872
250	2500	2547,5	36285	250	25	254,75	3625	250	249,9	245,25	3555	250	1,75	17,25	17,575
260	2600	2649,4	37736	260	26	264,94	3770	260	259,9	255,06	3697,2	260	1,82	17,94	18,278
270	2700	2751,3	39188	270	27	275,13	3915	270	269,9	264,87	3839,4	270	1,89	18,63	18,981
280	2800	2853,2	40639	280	28	285,32	4060	280	279,9	274,68	3981,6	280	1,96	19,32	19,684
290	2900	2955,1	42091	290	29	295,51	4205	290	289,9	284,49	4123,8	290	2,03	20,01	20,387
300	3000	3057	43542	300	30	305,7	4350	300	299,9	294,3	4266	300	2,1	20,7	21,09
310	3100	3158,9	44993	310	31	315,89	4495	310	309,9	304,11	4408,2	310	2,17	21,39	21,793
320	3200	3260,8	46445	320	32	326,08	4640	320	319,9	313,92	4550,4	320	2,24	22,08	22,496
330	3300	3362,7	47896	330	33	336,27	4785	330	329,9	323,73	4692,6	330	2,31	22,77	23,199
340	3400	3464,6	49348	340	34	346,46	4930	340	339,9	333,54	4834,8	340	2,38	23,46	23,902
350	3500	3566,5	50799	350	35	356,65	5075	350	349,9	343,35	4977	350	2,45	24,15	24,605

Mpa= 0,1 bar Mpa= 0,098 Kg/cm2 Mpa= 0,007 PSI	bar= 10 MPa bar= 0,981 Kg/cm2 bar= 0,069 PSI	Kg/cm^2= 10,19 MPa Kg/cm^2= 1,019 bar Kg/cm^2= 0,0703 PSI	PSI= 145,14 MPa PSI= 14,5 bar PSI= 14,22 kg/cm^2

Conversion table

Inches -> Millimetres 1Poll. = 25,40 mm							
in	mm	in	mm	in	mm	in	mm
1/64	0,397	1 1/2	38,1	15	381	36	914,4
1/32	0,764	1 3/4	44,45	16	406,4	38	965,2
3/64	1,191	2	50,8	17	431,8	40	1016
1/16	1,588	2 1/2	63,5	18	457,2	42	1066,8
3/32	2,381	3	76,2	19	482,6	44	1117,6
1/8	3,175	3 1/2	88,9	20	508	46	1168,4
5/32	3,969	4	101,6	21	533,4	48	1219,2
3/16	4,763	4 1/2	114,3	22	558,8	50	1270
1/4	6,35	5	127	23	584,2	55	1397
5/16	7,938	6	152,4	24	609,6	60	1524
3/8	9,525	7	177,8	25	635	65	1651
7/16	11,11	8	203,2	26	660,4	70	1778
1/2	12,7	9	228,6	27	685,8	75	1905
5/8	15,88	10	254	28	711,2	80	2032
3/4	19,05	11	279,4	29	736,6	85	2159
7/8	22,23	12	304,8	30	762	90	2286
1	25,4	13	330,2	32	812,8	95	2413
1 1/4	31,75	14	355,6	34	863,6	100	2540

Millimetres -> Inches 1 mm = 0,03937008 pollici							
mm	in	mm	in	mm	in	mm	in
1	0,039	28	1,102	130	5,12	750	29,53
2	0,079	30	1,181	140	5,51	800	31,50
3	0,118	35	1,378	150	5,91	850	33,46
4	0,157	40	1,575	160	6,30	900	35,43
5	0,197	45	1,772	170	6,69	950	37,40
6	0,236	50	1,969	180	7,09	1000	39,37
7	0,276	55	2,165	190	7,48	1250	49,21
8	0,315	60	2,362	200	7,87	1500	59,06
9	0,354	65	2,559	250	9,84	1750	68,90
10	0,394	70	2,756	300	11,81	2000	78,74
11	0,433	75	2,953	350	13,78	2500	98,43
12	0,472	80	3,150	400	15,75	3000	118,11
14	0,551	85	3,346	450	17,72	3500	137,80
16	0,630	90	3,543	500	19,69	4000	157,48
18	0,709	95	3,740	550	21,65	4500	177,17
20	0,787	100	3,937	600	23,62	5000	196,85
22	0,866	110	4,331	650	25,59	7500	295,28
26	1,024	120	4,724	700	27,56	10000	393,70

US Gallons -> Litres 1gallone = 3,785334 litri							
gal.	litri	gal.	litri	gal.	litri	gal.	litri
1	3,79	10	37,85	100	378,5	500	1893
2	7,57	20	75,71	120	454,2	600	2271
3	11,36	30	113,6	140	529,9	700	2650
4	15,14	40	151,4	160	605,7	800	3028
5	18,93	50	189,3	180	681,4	900	3407
6	22,71	60	227,1	200	757,1	1000	3785
7	26,50	70	265,0	250	946,3	1500	5678
8	30,28	80	302,8	300	1136	2000	7571
9	34,07	90	340,7	400	1514	3000	11356

Litres -> US Gallons 1litro = 0,2641775 galloni							
litri	gal.	litri	gal.	litri	gal.	litri	gal.
1	0,264	10	2,642	300	79,25	3000	792,5
2	0,528	20	5,284	400	105,7	4000	1057
3	0,793	30	7,925	500	132,1	5000	1321
4	1,057	40	10,57	600	158,5	6000	1585
5	1,321	50	13,21	700	184,9	8000	2113
6	1,585	100	26,42	800	211,3	10000	2642
7	1,849	150	39,63	900	237,8	20000	5284
8	2,113	200	52,84	1000	264,2	30000	7925
9	2,378	250	66,04	2000	528,4	50000	13209

Horsepower => Kilowatts 1 CV = 0,735 kW							
CV	Kw	CV	Kw	CV	Kw	CV	Kw
1	0,74	9	6,62	24	17,64	60	44,10
2	1,47	10	7,35	26	19,11	70	51,45
3	2,21	12	8,82	28	20,58	80	58,80
4	2,94	14	10,29	30	22,05	90	66,15
5	3,68	16	11,76	35	25,73	100	73,50
6	4,41	18	13,23	40	29,40	150	110,25
7	5,15	20	14,70	45	33,08	200	147,00
8	5,88	22	16,17	50	36,75	300	220,50

Kilowatts=>Horsepower 1 kW = 1,36 CV							
Kw	CV	Kw	CV	Kw	CV	Kw	CV
1	1,36	9	12,24	24	32,64	60	81,6
2	2,72	10	13,6	26	35,36	70	95,2
3	4,08	12	16,32	28	38,08	80	108,8
4	5,44	14	19,04	30	40,8	90	122,4
5	6,8	16	21,76	35	47,6	100	136
6	8,16	18	24,48	40	54,4	150	204
7	9,52	20	27,2	45	61,2	200	272
8	10,88	22	29,92	50	68	300	408

Table of oil viscosity according to temperature

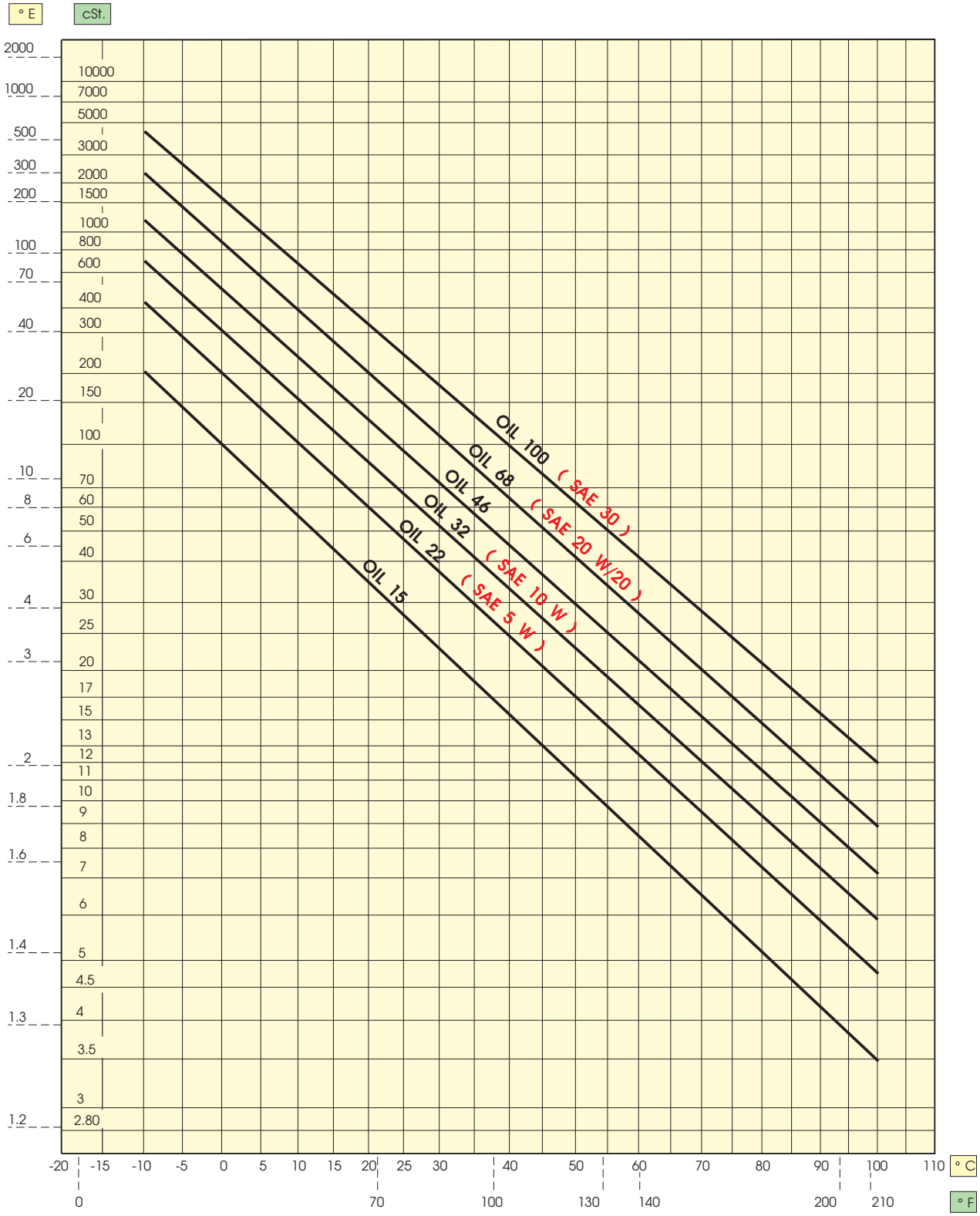
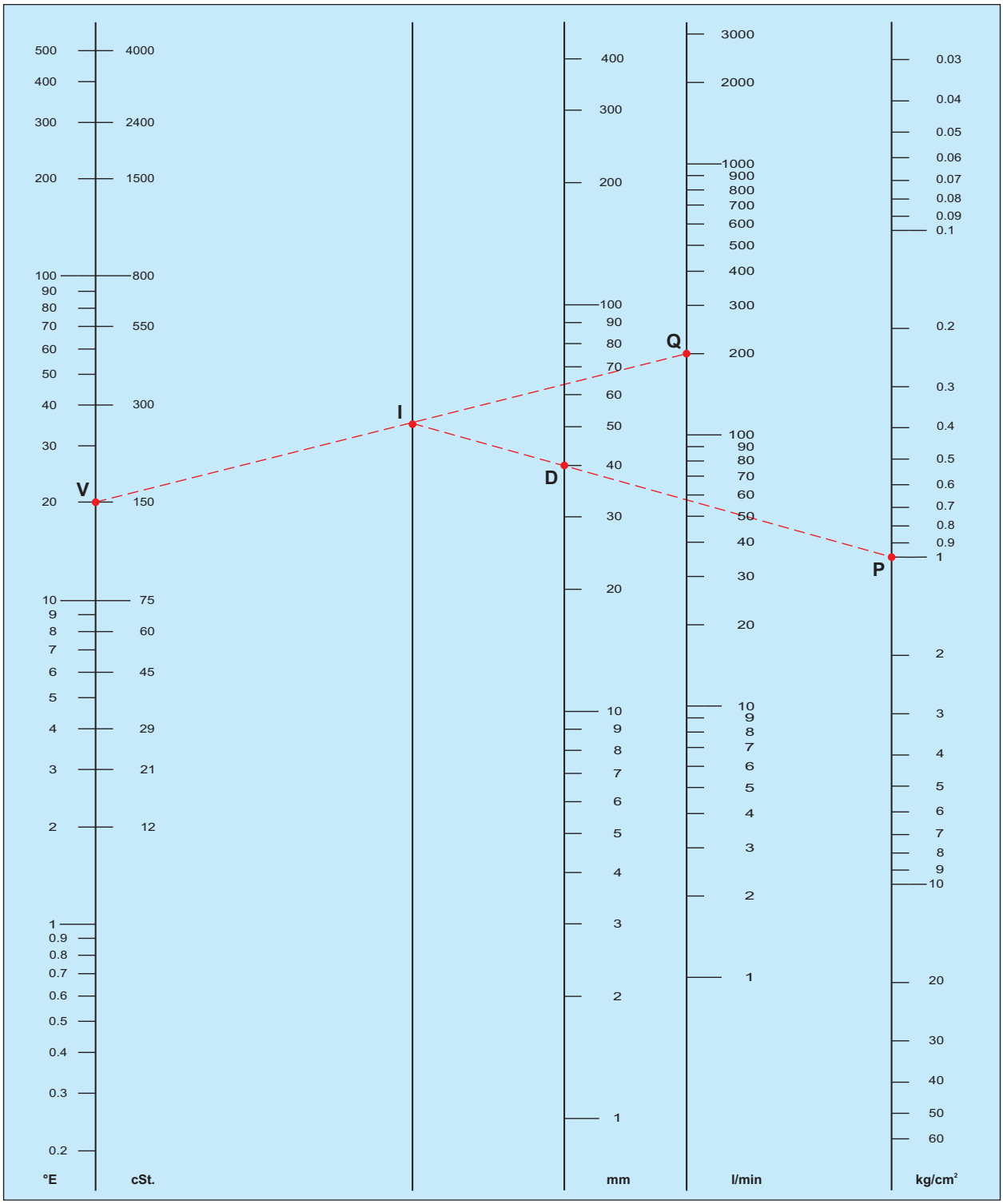


Table of pressure drops

Note: based on the oil viscosity and capacity of a pump it is possible to determine the pressure drop for every 100 m of piping by means of the table.
On the viscosity, flow rate and internal pipe diameter scales, fix the corresponding values **V**, **Q** and **D.**
Join points **V** and **Q** with a straight line intersecting point **I** on the "index" line.
From this point **I**, pass a straight line through **D** until meeting the pressure drop scale at point **P**; the corresponding value represents the pressure drop at point **P**; the corresponding value represents the pressure drop along 100 m of piping.
EXAMPLE: a pipe through which a fluid having a viscosity of 150 cSt. flows at a rate of 200 l/min and which has a diameter of 40 mm will have a pressure drop of 1 kg/cm^2 for every 100 m of length.



V= Viscosity cSt -°E
I = Index line of intersection
D= Internal pipe diameter in mm
Q= Flow rate in l/min
P= Pressure drop kg/cm^2 per 100 m

ViVolo BOLOGNA - ITALY

Table of Elements

Table of elements

Element	Symbol	Atomic N°	Atom. Wgt.	Melt. point °C
Hafnium	Hf	72	178,49	2150,00
Aluminium	Al	13	26,98	660,37
Americium	Am	95	243,00	994,00
Antimony	Sb	51	121,75	630,00
Silver	Ag	47	107,87	961,93
Argon	Ar	18	39,95	-189,30
Arsenic	As	33	74,92	817,00
Astetine	At	85	210,00	302,00
Actinium	Ac	89	227,00	1050,00
Nitrogen	N	7	14,01	-209,90
Barium	Ba	56	137,33	725,00
Beryllium	Be	4	9,01	1278,00
Berkelium	Bk	97	247,00	
Bismuth	Bi	83	208,98	271,30
Boron	B	5	10,81	2300,00
Bromine	Br	35	79,90	-7,20
Cadmium	Cd	48	112,41	320,90
Calcium	Ca	20	40,08	839,00
Californium	Cf	98	251,00	
Carbon	C	6	12,01	3500,00
Cerium	Ce	58	140,12	795,00
Cesium	Cs	55	132,91	28,50
Chlorine	Cl	17	35,45	-100,98
Cobalt	Co	27	58,93	1495,00
Krypton	Kr	36	83,80	-157,20
Chromium	Cr	24	52,00	1857,00
Curium	Cm	96	247,00	1340,00
Dysprosium	Dy	66	162,50	1412,00
Einstenium	Es	99	254,00	
Helium	He	2	4,00	-272,00
Erbium	Er	68	167,26	1522,00
Europium	Eu	63	151,96	822,00
Fermium	Fm	100	257,00	
Iron	Fe	26	55,85	1535,00

Element	Symbol	Atomic N°	Atom. Wgt.	Melt. point °C
Fluorine	F	9	19,00	-219,62
Phosphorus	P	15	30,97	44,10
Francium	Fr	87	223,00	27,00
Gadolinium	Gd	64	157,25	1311,00
Gallium	Ga	31	69,74	29,78
Germanium	Ge	32	72,59	937,40
Hydrogen	H	1	1,01	-259,14
Indium	In	49	114,82	156,61
Iodine	I	53	126,90	113,50
Iridium	Ir	77	192,22	2410,00
Ytterbium	Yb	70	173,04	824,00
Yttrium	Y	39	88,91	1523,00
Lanthanum	La	57	138,91	920,00
Lithium	Li	3	6,94	180,54
Lutetium	Lu	71	174,96	1656,00
Magnesium	Mg	12	24,31	638,80
Manganese	Mn	25	54,94	1245,00
Mendelevium	Md	101	258,00	
Mercury	Hg	80	200,59	-38,87
Molybdenum	Mo	42	95,94	2617,00
Neodymium	Nd	60	144,24	1010,00
Neon	Ne	10	20,17	-248,60
Neptunium	Np	93	237,05	640,00
Nickel	Ni	28	58,71	1453,00
Niobium	Nb	41	92,91	2468,00
Nobelium	No	102	259,00	
Holmium	Ho	67	164,93	1470,00
Gold	Au	79	196,97	1064,43
Osmium	Os	76	190,20	3045,00
Oxygen	O	8	16,00	-218,40
Palladium	Pd	46	106,40	1552,00
Lead	Pb	82	207,20	327,50
Platinum	Pt	78	195,09	1772,00
Plutonium	Pu	94	244,00	639,50

Element	Symbol	Atomic N°	Atom. Wgt.	Melt. point °C
Polonium	Po	84	209,00	254,00
Potassium	K	19	39,10	63,65
Praseodymiu	Pr	59	140,91	935,00
Promethium	Pm	61	145,00	
Protactinium	Pa	91	231,04	1600,00
Radium	Ra	88	226,03	700,00
Radon	Rn	86	222,00	-71,00
Copper	Cu	29	63,55	1083,00
Rhenium	Re	75	186,21	3180,00
Rhodium	Rh	45	102,91	1966,00
Rubidium	Rb	37	85,47	38,89
Ruthenium	Ru	44	101,07	2250,00
Samarium	Sm	62	150,40	1072,00
Scandium	Sc	21	44,96	1539,00
Selenium	Se	34	78,96	217,00
Silicon	Si	14	28,09	1410,00
Sodium	Na	11	22,99	97,80
Tin	Sn	50	118,69	231,90
Strontium	Sr	38	87,62	769,00
Thallium	Tl	81	204,37	303,50
Tantalum	Ta	73	180,95	2996,00
Technetium	Tc	43	98,91	2200,00
Tellurium	Te	52	127,60	449,50
Terbium	Tb	65	158,93	1360,00
Titanium	Ti	22	47,90	1660,00
Thorium	Th	90	232,04	1750,00
Thulium	Tm	69	168,93	1545,00
Tungsten	W	74	183,85	3410,00
Uranium	U	92	238,03	1132,00
Vanadium	V	23	50,94	1890,00
Xenon	Xe	54	131,30	-111,90
Zinc	Zn	30	65,38	419,58
Zirconium	Zr	40	91,22	1852,00
Sulfur	S	16	32,06	112,80

Specific weight of some substances

SOLIDS	
Aluminium	2,70
Silver	10,50
Diamond	8,51
Pure Iron	7,86
Cast Iron	7,27
Nickel	8,85
Gold	19,33
Brass	8,65
Lead	11,34
Platinum	21,45
Plexiglass	1,18
Copper	8,93

LIQUIDS	
Distilled water	1,00
Ethyl alcohol	0,79
Gasoline	0,68
Mercury	13,60
Linseed Oil	0,93
Petroleum	0,81

GASES	
Acetylene	1,10
Ammonia	0,77
Carbon Dioxide	1,98
Air	1,29
Nitrogen	1,25
Helium	0,18
Ethylene	1,26
Hydrogen	0,09
Methane	0,72
Oxygen	1,43

Table of chemical resistance of elastomers

Class	Behaviour	Effects on Physical Properties	Increase in Volume %	delta Sh.A
●	recommended	small or none	less than 10	less than 10
●	satisfactory	minor	from 10 to 30	from 10 to 20
●	unsatisfactory	moderate	from 30 to 60	from 20 to 30
●	not recommended	severe	greater than 60	greater than 30

NR = NATURAL RUBBER
SBR = STYRENE-BUTADIENE RUBBER
EPDM = ETHYLENE-PROPYLENE THERMOPOLYMER
NBR = NITRILE RUBBER
CR = POLYCHLOROPRENE
CSM = CHLOROSULPHONATED POLYETHYLENE
VMQ = SILICONE RUBBER
FKM = FLUOROCARBON RUBBER (VITON®)

Acetylene	-	●	●		●	●	●	●	●
Acetophenone	-	●	●	●	●		●		
Acetone	-	●	●	●	●	●	●	●	●
Acetic Acid	10	●	●	●	●	●	●	●	●
Acetic Acid	50	●	●	●	●	●	●	●	●
Acetic Acid	25	●	●	●	●	●	●	●	●
Acetic Acid	100	●	●	●	●	●	●	●	●
Boric Acid	10	●	●	●	●	●	●	●	●
Citric Acid	SAT	●	●	●	●	●	●	●	●
Chloroacetic Acid	-	●	●	●	●	●	●		●
Chromic Acid	40	●	●	●	●	●	●	●	●
Formic Acid	SAT.	●	●	●	●	●	●	●	●
Formic Acid	SAT				●	●	●		
Phosphoric Acid	60	●	●	●	●	●	●	●	●
Hypochlorous Acid	-	●		●	●	●	●		
Lactic Acid	-	●	●		●	●	●	●	●
Maleic Acid	-	●		●	●	●	●		●
Naphthenic Acid	-				●				●
Nitric Acid	10	●	●	●	●	●	●	●	●
Nitric Acid	65	●	●	●	●	●	●	●	●
Palmitic Acid	-	●	●	●	●	●	●	●	●
Salicylic Acid	-	●		●	●	●			●
Stearic Acid	-	●	●	●	●	●	●	●	
Sulfhydric Acid	10	●	●	●	●	●	●	●	●
Sulfhydric Acid	20	●	●		●	●	●	●	●
Sulfuric Acid	25	●	●		●	●	●	●	●
Sulfuric Acid	50	●	●		●	●	●	●	●
Sulfuric Acid	60	●	●		●	●	●	●	●
Sulfuric Acid	75	●	●		●	●	●	●	●
Sulfuric Acid	96	●	●	●	●	●	●	●	●
Sulfurous Acid	-	●	●	●	●	●	●	●	●
Tannic Acid	-	●	●		●	●	●	●	●
Tartaric Acid	10	●	●	●	●	●	●	●	●
Deionized Water	-	●	●	●	●	●	●	●	●
Turpentine	-	●	●		●	●	●		●
Acrylonitrile	-	●	●	●	●	●	●		●
Ammonia	-	●	●	●	●	●	●	●	●
Aniline	-	●	●	●	●	●	●	●	●
Aniline	-	●	●	●	●	●	●	●	●
Asphalt	-	●	●	●	●	●	●	●	●
ASTM 1 OIL	-	●	●	●	●	●	●	●	●
ASTM 2 OIL	-	●	●	●	●	●	●	●	●
ASTM 3 OIL	-	●	●	●	●	●	●	●	●
Benzene	-	●	●	●	●	●	●	●	●
Sodium Bicarbonate	-	●	●	●	●	●	●	●	●
Carbon Dioxide	-	●	●	●	●	●	●	●	●
Butter	-	●	●	●	●	●	●	●	●
Butadiene	-				●				●
Liquid Butane	-	●	●	●	●	●	●	●	
Fuel A (Isooctane 100%)	-	●	●	●	●	●	●	●	●
Fuel B (Isooct. 70% Toluene 3(	-	●	●	●	●	●	●	●	●
Fuel C (Isooct. 50% Toluene 5(	-	●	●	●	●	●	●	●	●
Fuel with Methanol or Ethanol	-	●	●	●	●	●			
Kerosene	-	●	●		●	●	●	●	●
Cyclohexane	-	●	●	●	●	●	●	●	●
Chloroacetone	-			●	●	●	●	●	●

Chloroform	-	●	●	●	●	●	●	●	●
Chloroprene	-	●	●	●	●	●	●	●	●
Dry Chlorine	-	●	●	●		●	●	●	●
Wet Chlorine	-	●	●	●	●	●	●	●	●
Dibutyl Phthalate	-	●	●	●	●	●	●		●
Diethylene Glycol	-	●	●	●	●	●	●	●	●
Diethyl Sebacate	-	●		●	●	●	●	●	●
Dinitrotoluene	-			●	●	●	●	●	●
Dioctyl Phthalate	-	●	●	●	●	●	●	●	●
Dioctyl Sebacate	-	●		●	●	●	●		●
Epichlorohydrin	-			●	●	●	●		●
Hexane	-	●	●	●	●	●	●	●	●
Ethanol	-	●	●	●	●	●	●	●	●
Fluorobenzene	-	●	●	●	●	●		●	●
Liquid Fluorine	-					●		●	
Formaldehyde	40	●	●		●	●	●	●	●
Formaldehyde	40				●		●		
Freon 11	-	●	●	●	●	●	●	●	●
Freon 12	-	●	●	●	●	●	●	●	●
Freon 21	-	●	●	●	●	●			●
Freon 22	-	●	●	●	●	●	●		
Freon 113	-	●	●	●	●	●	●	●	●
Freon 114	-	●		●	●	●	●	●	●
Glycerine	-	●	●	●	●	●	●	●	●
Silicone Grease	-			●	●	●	●	●	●
Hydrogen	-	●	●		●	●	●	●	●
Calcium Hydroxide	-	●	●		●	●	●	●	●
Sodium Hypochlorite	10	●	●	●	●	●	●	●	●
Milk	-	●		●	●	●	●	●	●
Mercury	-	●	●		●	●	●		
Methanol	-	●	●	●	●	●	●	●	●
Methyl Ethyl Ketone	-	●	●	●	●	●	●	●	●
Naphtha	-	●	●	●	●	●	●	●	●
Nitrobenzene	-	●	●	●	●	●	●	●	●
Nitroethane	-	●	●	●	●	●	●		●
Nitromethane	-	●	●	●	●	●	●	●	●
Nitropropane	-	●	●	●	●			●	●
Animal Oil (Whale-Seal)	-	●	●	●	●	●	●	●	●
Grain Oil	-	●	●	●	●	●	●	●	●
Coconut Oil	-	●		●		●	●		●
Cod-Liver Oil	-	●		●	●	●	●	●	●
Olive Oil	-	●	●	●	●	●	●	●	●
Cottonseed Oil	-	●	●	●	●	●	●	●	●
Silicon Oil	-			●	●	●	●	●	●
Castor Oil	-	●	●	●	●	●	●	●	●
Oxygen	-	●	●	●	●	●	●	●	●
Ozone	-	●	●	●	●	●	●	●	●
Perchloroethylene	-	●	●	●	●	●	●	●	●
Potassium Permanganate	25	●		●		●	●	●	●
Tetraethyl Lead	-			●		●	●		●
Propane	-	●	●		●	●	●	●	
Soda (Sodium Hydroxide)	10	●	●	●	●	●	●	●	●
Styrene	-	●	●	●	●	●	●	●	●
Toluene	-	●	●	●	●	●	●	●	●
Trichloroethylene	-	●	●	●	●	●	●	●	●
Sulfur	-	●	●	●	●	●		●	●

The data shown in the table are approximate

Table of mechanical features of elastomers

ELASTOMERS		NR	SBR	EPDM	NBR	CR	CSM	VMQ	FKM
Specific weight		0.93	0.95	0.86	0.97	1.25	1.2	1.2	1.82
Hardness	(Shore A)	25÷95	35÷95	40÷85	30÷90	25÷90	40÷90	30÷80	50÷90
Tensile strength	(MPa)	14÷30	7÷28	6÷18	7÷25	7÷24	12÷24	4÷9	5÷17
Ultimate elongation	(%)	150÷850	125÷850	150÷500	150÷750	100÷800	150÷500	400÷600	12 5÷300
Resilience	(%)	30÷65	25÷55	35÷55	10÷50	20÷50	5÷20	40÷55	5÷10
Extreme operating temperatures	(℃)	-45÷85	-40÷90	-40÷155	-40÷110	-40÷100	-15÷120	-50÷225	-20÷ 250
Abrasion resistance		🔵	🟢 🔵	🔵	🟢	🟢 🔵	🟢 🔵	🟠	🔵 🟠
Gas impermeability		🟠	🔵 🟠	🟠	🟢 🔵	🔵	🔵	🔴	🟢

Class	Behaviour
🟢	recommended
🔵	satisfactory
🟠	unsatisfactory
🔴	not recommended

NR = NATURAL RUBBER
SBR = STYRENE-BUTADIENE RUBBER
EPDM = ETHYLENE-PROPYLENE THERMOPOLYMER
NBR = NITRILE RUBBER
CR = POLYCHLOROPRENE
CSM = CHLOROSULPHONATED POLYETHYLENE
VMQ = SILICONE RUBBER
FKM = FLUOROCARBON RUBBER (VITON®)

VITON® is a registered trademark of Dupont Dow Elastomers L.L.C.

Specifications of **TEFLON®** (Virgin PTFE)

Properties	U.m.	Values (from-to)
Specific weight	-	**2.14 - 2.20**
Ultimate strength	N/mm2	**20 - 35**
Ultimate elongation	%	**210 - 400**
Compressive strength 1% deformat.	N/mm2	**4.00 - 4.50**
Flexural strength 0.7 N/mm2	N/mm2	**no breakage**
Shock resistance 57℃	J/cm	**1,1**
Shock resistance 23℃	J/cm	**1,6**
Shock resistance 77℃	J/cm	**3,3**
Hardness	(shoreD)	**50 - 60**
Static friction coefficient	-	**0,09**
Dynamic friction coefficient	-	**0,05**
PTFE - oil-lubricated steel	-	**0,02 - 0,06**
Coefficient of expansion from 25 to 100℃	$℃^{-1}$	**16×1^{-5}**
Thermal conductivity	W/mK	**0,2**
Distortion temperatures 0.46 N/mm2	℃	**130 - 140**
Distortion temperatures 1.85 N/mm2	℃	**50 - 60**
Water absorption	%	**<0,01**
Inflammability ATB	sec	**<5,00**
Inflammability AEB	mm	**<5,00**
Operating temperature	℃	**-200 +260**

The data shown in the table are approximate

TEFLON® is a registered trademark of E.I. Dupont De Nemours & Co.

Table of tapping holes

ISO METRIC
M

Thread Diameter mm	Drill Hole Diameter mm
M 1 x 0,25	0,75
M 1,1 x 0,25	0,85
M 1,2 x 0,25	0,95
M 1,4 x 0,30	1,1
M 1,6 x 0,35	1,25
M 1,8 x 0,35	1,45
M 2 x 0,4	1,6
M 2,2 x 0,45	1,75
M 2,5 x 0,45	2,05
M 3 x 0,5	2,5
M 3,5 x 0,6	2,9
M 4 x 0,7	3,3
M 4,5 x 0,75	3,7
M 5 x 0,8	4,2
M 6 x 1	5
M 7 x 1	6
M 8 x 1,25	6,8
M 9 x 1,25	7,8
M 10 x 1,5	8,5
M 11 x 1,5	9,5
M 12 x 1,75	10,2
M 14 x 2	12
M 16 x 2	14
M 18 x 2,5	15,5
M 20 x 2,5	17,5
M 22 x 2,5	19,5
M 24 x 3	21
M 27 x 3	24
M 30 x 3,5	26,5
M 33 x 3,5	29,5
M 36 x 4	32
M 39 x 4	35
M 42 x 4,5	37,5
M 45 x 4,5	40,5
M 48 x 5	43
M 52 x 5	47
M 56 x 5,5	50,5

ISO METRIC FINE
MF

Thread Diameter mm	Drill Hole Diameter mm
M 1 x 0,2	0,75
M 1,1 x 0,2	0,9
M 1,2 x 0,2	1
M 1,4 x 0,2	1,2
M 1,4 x 0,25	1,15
M 1,6 x 0,2	1,4
M 1,8 x 0,2	1,6
M 2 x 0,25	1,75
M 2,2 x 0,25	1,95
M 2,5 x 0,35	2,15
M 3 x 0,35	2,65
M 3,5 x 0,35	3,15
M 4 x 0,35	3,65
M 4 x 0,5	3,5
M 4,5 x 0,5	4
M 5 x 0,5	4,5
M 5,5 x 0,5	5
M 6 x 0,75	5,2
M 7 x 0,75	6,2
M 8 x 1	7
M 8 x 0,75	7,2
M 9 x 1	8
M 9 x 0,75	8,2
M 10 x 1	9
M 10 x 0,75	9,2
M 10 x 1,25	8,8
M 11 x 1	10
M 11 x 0,75	10,2
M 12 x 1	11
M 12 x 1,25	10,8
M 12 x 1,5	10,5
M 14 x 1	13
M 14 x 1,25	12,8
M 14 x 1,5	12,5
M 15 x 1	14
M 15 x 1,5	13,5
M 16 x 1	15
M 16 x 1,5	14,5
M 17 x 1	16
M 17 x 1,5	15,5
M 18 x 1	17
M 18 x 1,5	16,5
M 18 x 2	16
M 20 x 1	19
M 20 x 1,5	18,5
M 20 x 2	18
M 22 x 1	21
M 22 x 1,5	20,5
M 22 x 2	20
M 24 x 1	23
M 24 x 1,5	22,5

Thread Diameter mm	Drill Hole Diameter mm
M 24 x 2	22
M 25 x 1	24
M 25 x 1,5	23,5
M 25 x 2	23
M 26 x 1,5	24,5
M 27 x 1	26
M 27 x 1,5	25,5
M 27 x 2	25
M 28 x 1	27
M 28 x 1,5	26,5
M 28 x 2	26
M 30 x 1	29
M 30 x 1,5	28,5
M 30 x 2	28
M 30 x 3	27
M 32 x 1,5	30,5
M 32 x 2	30
M 33 x 1,5	31,5
M 33 x 2	31
M 33 x 3	30
M 35 x 1,5	33,5
M 36 x 1,5	34,5
M 36 x 2	34
M 36 x 3	33
M 38 x 1,5	36,5
M 39 x 1,5	37,5
M 39 x 2	37
M 39 x 3	36
M 40 x 1,5	38,5
M 40 x 2	38
M 40 x 3	37
M 42 x 1,5	40,5
M 42 x 2	40
M 42 x 3	39
M 42 x 4	38
M 45 x 1,5	43,5
M 45 x 2	43
M 45 x 3	42
M 45 x 4	41
M 48 x 1,5	46,5
M 48 x 2	46
M 48 x 3	45
M 48 x 4	44
M 50 x 1,5	48,5
M 50 x 2	48
M 50 x 3	47
M 52 x 1,5	50,5
M 52 x 2	50
M 52 x 3	49
M 52 x 4	48

Table of tapping holes

WHITWORTH **W**

BSW

Nominal Thread Diameter	Drill Hole Diameter
Inches	mm
1/8 - 40	2,55
5/32 - 32	3,2
3/16 - 24	3,7
1/4 - 20	5,1
5/16 - 18	6,5
3/8 - 16	7,9
7/16 - 14	9,2
1/2 - 12	10,5
9/16 - 12	12
5/8 - 11	13,5
3/4 - 10	16,25
7/8 - 9	19,25
1 - 8	21,75
1 1/8 - 7	24,75
1 1/4 - 7	27,75
1 3/8 - 6	30,5
1 1/2 - 6	33,5
1 5/8 - 5	35,5
1 3/4 - 5	39
2 - 4 1/2	44,5
2 1/4 - 4	50
2 1/2 - 4	56,5
2 3/4 - 3 1/2	62
3 - 3 1/2	62

WHITWORTH **GAS**

BSP

Nominal Thread Diameter	Drill Hole Diameter
Inches	mm
G 1/8 - 28	8,8
G 1/4 - 19	11,8
G 3/8 - 19	15,25
G 1/2 - 14	19
G 5/8 - 14	21
G 3/4 - 14	24,5
G 7/8 - 14	28,25
G 1 - 11	30,75
G 1 1/8 - 11	35,3
G 1 1/4 - 11	39,25
G 1 3/8 - 11	41,9
G 1 1/2 - 11	45,25
G 1 3/4 - 11	51,3
G 2 - 11	57
G 2 1/4 - 11	63,1
G 2 1/2 - 11	72,6
G 2 3/4 - 11	79,1
G 3 - 11	85,5
G 3 1/4 - 11	91,5
G 3 1/2 - 11	97,7
G 3 3/4 - 11	104
G 4 - 11	110,5

TAPERED GAS

BSPT

Nominal Thread Diameter	Drill Hole Diameter
Inches	mm
1/8 - 28	8,4
1/4 - 19	11,2
3/8 - 19	14,75
1/2 - 14	18,25
3/4 14	23,75
1 - 11	30
1 1/4 - 11	38,5
1 1/2 - 11	44,5
2 - 11	56
2 1/2 - 11	71,5

AMERICAN

NPT

Nominal Thread Diameter	Drill Hole Diameter
Inches	mm
1/6 - 27	6,25
1/8 - 27	8,5
1/4 - 18	11
3/8 - 18	14,5
1/2 14	18
3/4 - 14	23
1 - 11 1/2	29
1 1/4 - 11 1/2	38
1 1/2 - 11 1/2	44
2 - 11 1/2	56
2 1/2 - 8	67

UNIFIED COARSE THREAD

UNC

Nominal Thread Diameter	Drill Hole Diameter
Inches	mm
Nr. 1 - 64	1,5
Nr. 2 - 56	1,8
Nr. 3 - 48	2,02
Nr. 4 - 40	2,25
Nr. 5 - 40	2,6
Nr. 6 - 32	2,75
Nr. 8 - 32	3,4
Nr. 10 - 24	3,8
Nr. 12 - 24	4,5
1/4 - 20	5,1
5/46 - 18	6,5
3/8 - 16	8
7/16 - 14	9,4
1/2 - 13	10,75
9/16 - 12	12,2
5/8 - 11	13,6
3/4 - 10	16,5
7/8 - 9	19,5
1 - 8	22,25
1 1/8 - 7	25
1 1/4 - 7	28,25
1 3/8 - 6	30,75
1 1/2 - 6	34
1 3/4 - 5	39,5
2 - 4 1/2	45

UNIFIED COARSE THREAD

UNF

Nominal Thread Diameter	Drill Hole Diameter
Inches	mm
Nr. 0 - 80	1,25
Nr. 1 - 72	1,55
Nr. 2 - 64	1,85
Nr. 3 - 56	2,1
Nr. 4 - 48	2,35
Nr. 5 - 44	2,65
Nr. 6 - 40	2,9
Nr. 8 - 36	3,5
Nr. 10 - 32	4,1
Nr. 12 - 28	4,6
1/4 - 28	5,5
5/16 - 24	6,9
3/8 - 24	8,5
7/16 - 20	9,9
1/2 - 20	11,5
9/16 - 18	12,9
5/8 - 18	14,5
3/4 - 16	17,5
7/8 - 14	20,5
1 - 12	23,25
1 1/8 - 12	26,5
1 1/4 - 12	29,75
1 3/8 - 12	33
1 1/2 - 12	36

AMERICAN

NPTF

Nominal Thread Diameter	Drill Hole Diameter
Inches	mm
1/6 - 27	6,15
1/8 - 27	8,4
1/4 - 18	10,9
3/8 - 18	14,25
1/2 14	17,75
3/4 - 14	23
1 - 11 1/2	29
1 1/4 - 11 1/2	37,75
1 1/2 - 11 1/2	43,75
2 - 11 1/2	55,75
2 1/2 - 8	66,5

ViVOLO BOLOGNA - ITALY

Table of tapping holes

DRILL HOLES FOR ROLL FORM TAPS

ISO METRIC
M

Thread Diameter mm	Drill Hole Diameter mm
M 1 x 0.25	0,9
M 1,2 x 0.25	1,1
M 1,4 x 0,3	1,25
M 1,6 x 0.35	1,45
M 1,8 x 0.35	1,65
M 2 x 0.4	1,8
M 2,5 x 0.45	2,3
M 3 x 0,5	2,8
M 3,5 x 0,6	3,2
M 4 x 0,7	3,7
M 5 x 0,8	4,6
M 6 x 1	5,5
M 7 x 1	6,5
M 8 x 1.25	7,4
M 10 x 1,5	9,3
M 12 x 1.75	11,2
M 14 x 2	13
M 16 x 2	15

UNIFIED COARSE THREAD
UNC

Nominal Thread Diameter Inches	Drill Hole Diameter mm
Nr. 1 - 64	1,7
Nr. 2 - 56	2
Nr. 3 - 48	2,3
Nr. 4 - 40	2,6
Nr. 5 - 40	2,9
Nr. 6 - 32	3,2
Nr. 8 - 32	3,8
Nr. 10 - 24	4,4
Nr. 12 - 24	5
1/4 - 20	5,8
5/16 - 18	7,3
3/8 - 16	8,8
7/16 - 14	10,3
1/2 - 13	11,9

ISO METRIC FINE
MF

Thread Diameter mm	Drill Hole Diameter mm
M 4 x 0.5	3,5
M 5 x 0,5	4,5
M 6 x 0.75	5,2
M 8 x 0.75	7,2
M 8 x 1	7,2
M 10 x 1	9
M 10 x 1.25	8,8
M 12 x 1	11
M 12 x 1.25	10,8
M 12 x 1.5	10,5
M 14 x 1	13
M 14 x 1.25	12,8
M 14 x 1,5	12,5
M 16 x 1	15
M 16 x 1,5	14,5

UNIFIED COARSE THREAD
UNF

Nominal Thread Diameter Inches	Drill Hole Diameter mm
Nr. 1 - 72	1,7
Nr. 2 - 64	2
Nr. 3 - 56	2,3
Nr. 4 - 48	2,6
Nr. 5 - 44	2,9
Nr. 6 - 40	3,2
Nr. 8 - 36	3,9
Nr. 10 - 32	4,5
Nr. 12 - 28	5,1
1/4 - 28	6
5/16 - 24	7,5
3/8 - 24	9,1
7/16 - 20	10,6
1/2 - 20	12,1

SAMT HYDRAULICS

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