

8-9 THREE & FOUR WAY

FORGED STEEL BALL VALVES



PED 97/23 EC

CE 0038

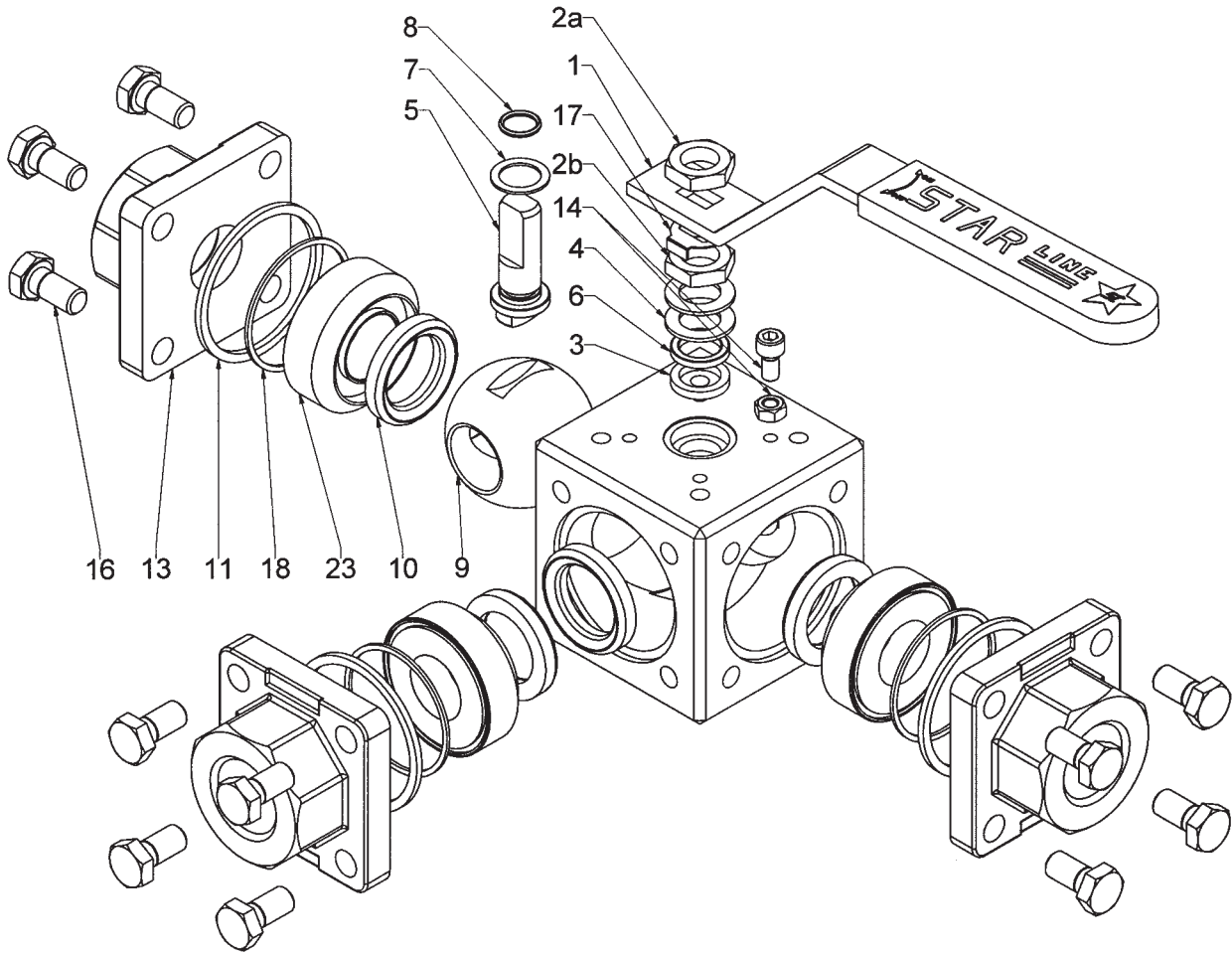
Certificate N°: RPS 0160304/01

ATEX 94/9 CE



Tech. File N° ST01 ATEX





- Suggested materials after 2 years service
- Empfohlene ersatzteile für 2 Jahres betrieb
- Pièces de rechange conseillées pour 2 ans de service
- Recambios aconsejados para 2 años de servicio

- Suggested materials after 5 years service
- Empfohlene ersatzteile für 5 Jahres betrieb
- Pièces de rechange conseillées pour 5 ans de service
- Recambios aconsejados para 5 años de servicio

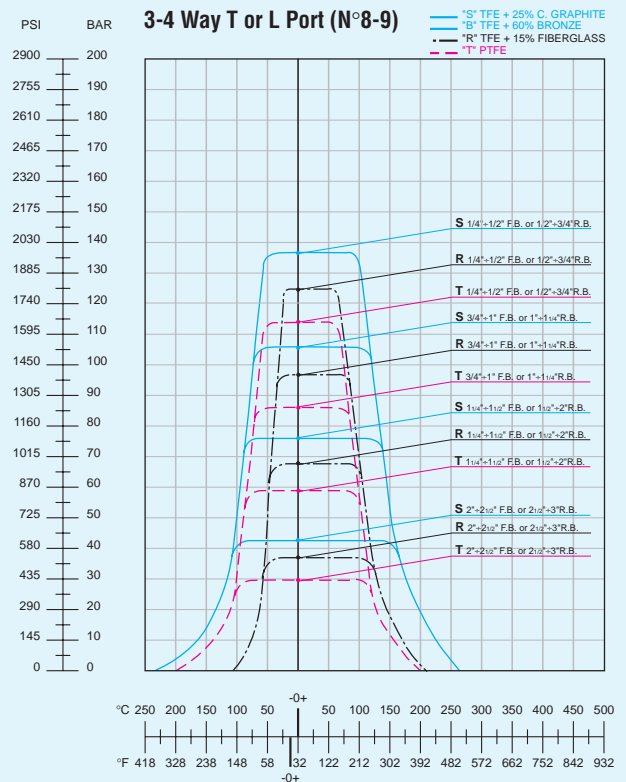
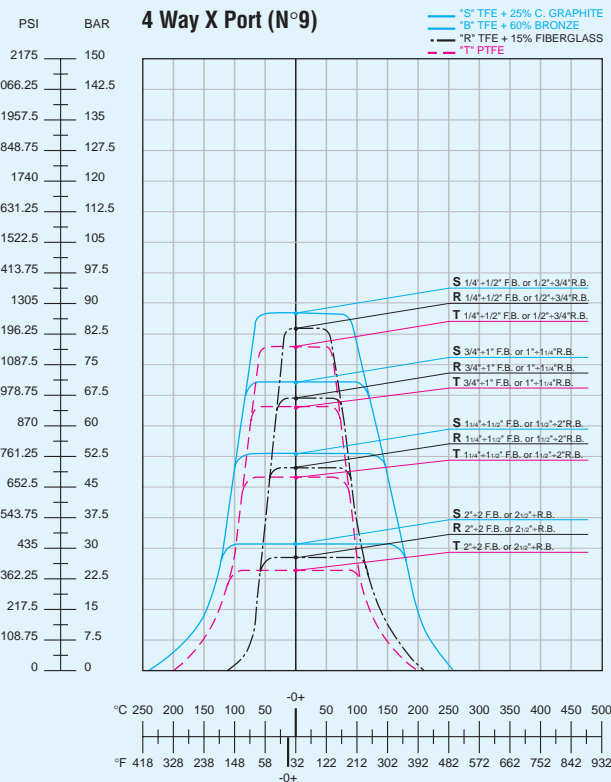
For size 1/4" to 1.1/2" Full Bore; 1/2" to 2" Reduced Bore n° 4 Bolts for Side
 For size 2" Full Bore; 2.1/2" Reduced Bore n°6 Bolts for Side
 For size 2.1/2" Full Bore; 3" Reduced Bore n°8 Bolts for Side

ITEM	Q.TY	Part name Bezeichnung	Designation Componentes	A105/F316	LF2/F316	F316/F316
1	1	Handle Handhebel	Levier Maneta	C.S. Galvanized Plastic cover	C.S. Galvanized Plastic cover	C.S. Galvanized Plastic cover
••2	A B	2 Nut Mutter	Ecrou Tuerca	C.S. Cadmium Plated	C.S. Cadmium Plated	S.S. 316
• 3	1	Packing ring Stopfbuchsenpackung	Guarniture Junta eje	Graphite	Graphite	Graphite
•• 4	2	Spring washer Tellerfedern	Rondelle ressort Arandela	Special S.S.	Special S.S.	Special S.S.
•• 5	1	Antistatic stem Antistatische spindel	Tige antistatique Eje antiestatico	S.S. 316	S.S. 316	S.S. 316
6	1	Gland packing Druck ring	Fouloir Estopada	S.S. 316	S.S. 316	S.S. 316
• 7	1	Thrust washer Spindeldichtung	Rondelle butée Junta eje	Reinf. PTFE	Reinf. PTFE	PTFE
• 8	1	«O» Ring stem «O» Ring spindel	Joint torique Torica eje	VITON	VITON	VITON
•• 9	1	Ball Kugel	Sphère Espera	S.S. 316	S.S. 316	S.S. 316
• 10	4	Seats Sitzring	Sièges Asientos	T-R-S-B	T-R-S-B	T-R-S-B
• 11	3	Body seal Gehäusedichtung	Joint de corps Junta cuerpo	Graphite - T	Graphite - T	Graphite - T
12	1	Body Gehäuse	Corps Cuerpo	ASTM A105	A350 LF2	A182 F316
13	3	End connections Anschlußstutzen	Embout Terminales	ASTM A105	A350 LF2	A182 F316L
14	1	Stop-pin Anschlag	Butée Tope	S.S. 304	S.S. 304	S.S. 304
16	note 1	Bolts Gehäuseschraube	Vis Goujon	ASTM A193 B7 Galvanized	ASTM A193 B8	ASTM A193 B8
••17	1	Stop washer Sicherungsscheiße	Rondelle-frein Arandela de seguridad	S.S. 304	S.S. 304	S.S. 304
• 18	3	Body seal Gehäusedichtung	Joint de corps Junta de cuerpo	VITON	VITON	VITON
23	3	Ring - seat Ring - sitzring	Joints de sieges Junta asientos	ASTM A105	A350 LF2	A182 F316

DESCRIPTION

- CONSTRUCTION** : MULTI-PORT BALL VALVES BOLTED CONSTRUCTION - SOLID BALL - ANTI BLOW OUT PROOF STEM DESIGN
ENCAPSULATED SOFT SEATS - N° 4 SEATS THAT SUPPORT THE BALL - HIGH INTEGRITY SHUT-OFF AT LOW AND HIGH PRESSURE - ANTISTATIC DEVICE - ISO 5211 ON THE TOP FOR EASY AUTOMATION.
- SIZE** : DN 8 ÷ 65 FULL BORE -- DN 15 ÷ 80 REDUCED BORE
1/4" ÷ 2.1/2" FULL BORE -- 1/2" ÷ 3" REDUCED BORE
- CLASS** : PN 16 ÷ 100 or ASME 150 ÷ 600 LBS
- TEMPERATURE** : -100°C UP TO + 260°C
- DESIGN** : ASME B16.34 - ASME B31.1 - BS5351 - API 6D - P.E.D. 97/23/EC - ATEX 94/9 CE
- MARKING** : MSS SP25
- CE 0038** : ACCORDING TO DIRECTIVE 97/23/CE - MODULE H CATEGORY III - NOTIFIED BODY LLOYD'S REGISTERED CERTIFICATE NR. RPS 01060304/01
- Ex IM2/II 2GD** : ACCORDING TO ATEX 94/9 CE - TECHNICAL FILE NR. ST01 ATEX
- MATERIAL** : ASTM A105 - 316 - 316L - LF2 - SPECIAL MATERIALS
- TEST CERTIFICATE** : UNI EN 10204 TYPE 3.1B UNLESS OTHERWISE REQUIRED
- SERVICES** : FOR PETROLEUM, CHEMICALS, PETROL-CHEMICALS AND ALLIED INDUSTRIES

PRESSURE/TEMPERATURE LIMITATIONS OF SEAT SEAL



FLOW DATA

The following flow rates were determined for ball valves in fully open position and a water temperature of 60°F (15°C).
 Kv value is the full capacity flow rate through the ball valve in cubic metres per hour (m³/h) with a pressure drop of 1 bar.
 Cv value is the full capacity flow rate through the ball valve in gallons/min. of water at 60°F with a pressure drop of 1 psi.

TABLE FOR VALVE "T" AND "L" PORT FULL BORE

VALVE SIZE	1/4"	3/8"	1/2"	3/4"	1"	1.1/4"	1.1/2"	2"	2.1/2"
Cv	5.6	5.6	10.5	24	40	60	87.5	175	223
KV	4.8	4.8	9	20.5	34.5	51.5	75	150	192

TABLE FOR VALVE "X" PORT FULL BORE

VALVE SIZE	1/4"	3/8"	1/2"	3/4"	1"	1.1/4"	1.1/2"	2"	-
Cv	2.8	2.8	2.8	9.5	22	36	60	90	-
KV	2.4	2.4	2.4	8	18.7	30	51	76	-

TABLE FOR VALVE "T" AND "L" PORT REDUCED BORE

VALVE SIZE	1/2"	3/4"	1"	1.1/4"	1.1/2"	2"	2.1/2"	3"
Cv	5.6	10.5	24	40	60	87.5	175	223
KV	4.8	9	20.5	34.5	51.5	75	150	192

TABLE FOR VALVE "X" PORT REDUCED BORE

VALVE SIZE	1/2"	3/4"	1"	1.1/4"	1.1/2"	2"	2.1/2"	-
Cv	2.8	2.8	9.5	22	36	60	90	-
KV	2.4	2.4	8	18.7	30	51	76	-

HOW TO ORDER

TYPE OF PORT CONFIGURATION	1 = PORT DESIGN	2 = TYPE OF VALVE	3 = BASE MATERIAL BODY/TRIM	4 = SEAT MATERIAL	5 = STEM PACKING	6 = FIRST BODY SEAL	7 = SEAL OF SEAT RETAINER
T1 - T2 - T3 - T4 T5 - T6 - T7 - T8 L1 - L2 - L3 - L4 L7 X1	1 Full Bore 2 Regular Bore	8 - 3 way 9 - 4 way	1 F321 / F316 2 A105/MONEL K500 3 A105/F316 4 F44/F44 5 LF2/316 6 F316/F316 7 F316L/F316L 8 MONEL/MONEL K500 0 For all different materials	R Reinforced TFE 15% Fiberglass S Reinforced TFE 20%C. + 5%Gr. T Virgin PTFE B Bronze 60% Moly Filled TFE	G Graphite R Reinforced TFE 15% Fiberglass S Reinforced TFE 20%C. + 5%Gr. T Virgin PTFE	G Graphite T Virgin PTFE	V O-Ring viton S Reinforced TFE 20%C. + 5%Gr.
NOTES: The above codifications are punched on the handle together with year of construction. (*) This letter code is not punched on the handle but must appear on all documents. Size, rating and connections are not in code and must be clearly shown on all orders.				EXAMPLE: 1/2" NPT 600LB R.B. 3 way T port 90° T5 in A105/F316 with S seats. On the order must be described. 1/2" NPT 600 LB T5 283 SGS-V			

3 WAY "T" PORT CONFIGURATION

STANDARD	1 = PORT DESIGN						
T5 - 90°	T4 - 90°	T3 - 90°	T6 - 90°	T1 - 180°	T2 - 180°	T9 - 180°	T7 - 180°

3 WAY "L" PORT CONFIGURATION

STANDARD	OTHER		VERTICAL "L"
L2 - 90°	L1 - 180°	L3 - 180°	L4 - 180°

4 WAY CONFIGURATION

"T" PORT	"L" PORT	"X" PORT
T8 - 180°	L7 - 180°	X - 90°

CONNECTIONS AVAILABLE

THREADED END

BSP Parallel : BS21Rp-ISO228/1-ISO7/1Rp
 BSP Taper : BS21Rc-ISO7/1Rc-DIN2999/1
 NPT : ANSI B1 20.1

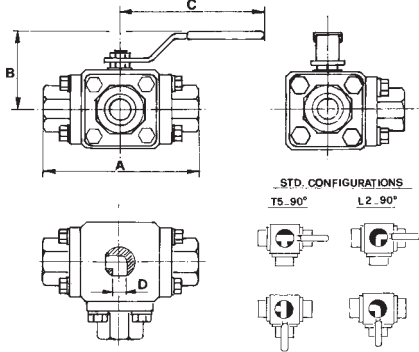
FLANGED END

R.F. - R.J. : ASME B16.5 - Face to Face ASME B16.10

WELDED END

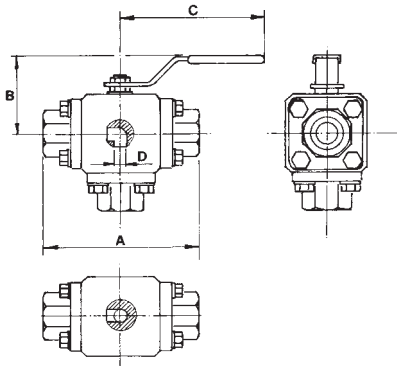
S.W. : ASME B16.11 - BS5351
 B.W.-P.E. : ASME B16.25 Sch. 5S-10S-40-80-XS
 WELDED NIPPLE : ASME B36.10 Sch. 40-80-XS

Configuration available: T1 - T2 - T3 - T4 - T5 - T6 - T7
L1 - L2 - L3



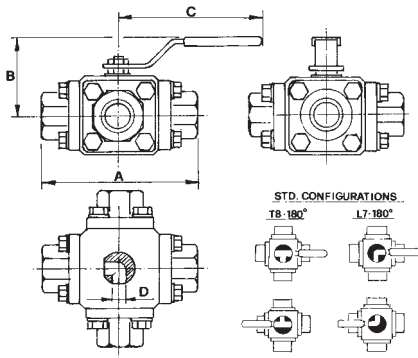
THREE WAY "T" or "L" PORT. SCREWED. SW OR BW										
VALVE SIZE				DIMENSIONS (mm)				WEIGHT		
FULL BORE		RED. BORE		A		B	C	D	kg	Lbs
Inch.	DN	Inch.	DN	SCREWED	SW-BW					
1/4"	8	-	-	113	113	70	152	11,1	2,3	5,0
3/8"	10	1/2"	15	113	113	70	152	11,1	2,3	5,0
1/2"	15	3/4"	20	119	119	75	193	14,2	3,0	6,5
3/4"	20	1"	25	150	150	86	193	21,0	5,0	11,0
1"	25	1.1/4"	32	158	158	98	225	25,4	7,0	15,0
1.1/4"	32	1.1/2"	40	182	182	113	225	31,7	10,0	21,5
1.1/2"	40	2"	50	201	201	118	225	38,0	13,5	29,0
2"	50	2.1/2"	65	262	302	135	420	49,0	55,0	118,0
2.1/2"	65	3"	80	423	423	165	420	63,5	65,0	140,0

Configuration available: L4



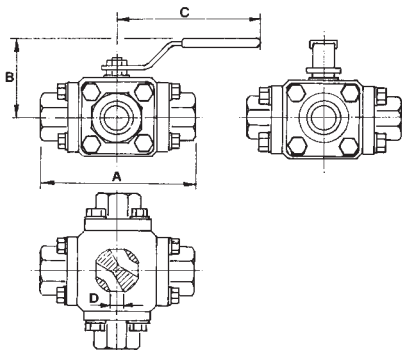
THREE WAY VERTICAL "L" PORT. SCREWED. SW OR BW										
VALVE SIZE				DIMENSIONS (mm)				WEIGHT		
FULL BORE		RED. BORE		A		B	C	D	kg	Lbs
Inch.	DN	Inch.	DN	SCREWED	SW-BW					
1/4"	8	-	-	113	113	70	152	11,1	2,3	5,0
3/8"	10	1/2"	15	113	113	70	152	11,1	2,3	5,0
1/2"	15	3/4"	20	119	119	75	193	14,2	3,0	6,5
3/4"	20	1"	25	150	150	86	193	21,0	5,0	11,0
1"	25	1.1/4"	32	158	158	98	225	25,4	7,0	15,0
1.1/4"	32	1.1/2"	40	182	182	113	225	31,7	10,0	21,5
1.1/2"	40	2"	50	201	201	118	225	38,0	13,5	29,0
2"	50	2.1/2"	65	262	302	135	420	49,0	55,0	118,0
2.1/2"	65	3"	80	423	423	165	420	63,5	65,0	140,0

Configuration available: T8 - L7



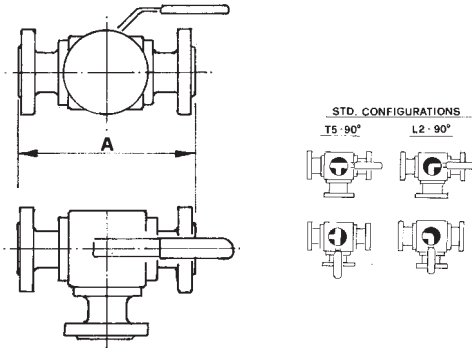
FOUR WAY "T" or "L" PORT. SCREWED. SW OR BW										
VALVE SIZE				DIMENSIONS (mm)				WEIGHT		
FULL BORE		RED. BORE		A		B	C	D	kg	Lbs
Inch.	DN	Inch.	DN	SCREWED	SW-BW					
1/4"	8	-	-	113	113	70	152	11,1	2,6	5,5
3/8"	10	1/2"	15	113	113	70	152	11,1	2,6	5,5
1/2"	15	3/4"	20	119	119	75	193	14,2	3,5	7,5
3/4"	20	1"	25	150	150	86	193	21,0	5,5	12,0
1"	25	1.1/4"	32	158	158	98	225	25,4	8,0	17,0
1.1/4"	32	1.1/2"	40	182	182	113	225	31,7	11,0	23,5
1.1/2"	40	2"	50	201	201	118	225	38,0	15,0	32,0
2"	50	2.1/2"	65	262	302	135	420	49,0	58,0	125,0
2.1/2"	65	3"	80	423	423	165	420	63,5	70,0	150,5

Configuration available: X



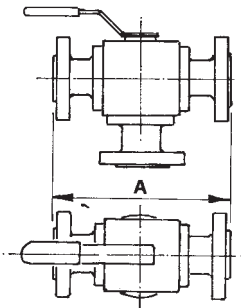
FOUR WAY "X" PORT. SCREWED. SW OR BW										
VALVE SIZE				DIMENSIONS (mm)				WEIGHT		
FULL BORE		RED. BORE		A		B	C	D	kg	Lbs
Inch.	DN	Inch.	DN	SCREWED	SW-BW					
1/4"	8	-	-	119	119	75	193	6,5	3,5	7,5
3/8"	10	1/2"	15	119	119	75	193	6,5	3,5	7,5
1/2"	15	3/4"	20	150	150	86	193	12	5,5	12,0
3/4"	20	1"	25	158	158	98	225	18	8,0	17,0
1"	25	1.1/4"	32	182	182	113	225	21	11,0	23,5
1.1/4"	32	1.1/2"	40	201	201	118	225	28	15,0	32,0
1.1/2"	40	2"	50	262	302	135	420	34	58,0	125,0
2"	50	2.1/2"	65	423	423	165	420	42	70,0	150,8

Configuration available: T1 - T2 - T3 - T4 - T5 - T6 - T7
L1 - L2 - L3



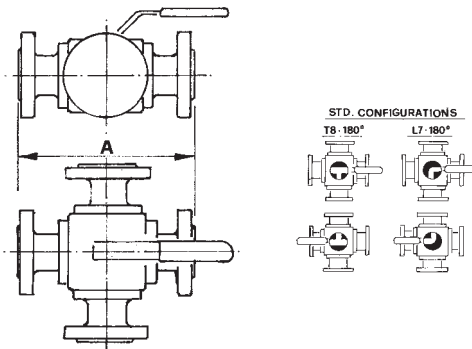
THREE WAY "T" or "L" PORT. FLANGED											
REDUCED BORE						FULL BORE					
VALVE SIZE		DIMENSION A (mm)				VALVE SIZE		DIMENSION A (mm)			
Inch.	DN	PN	ASME/ANSI			Inch.	DN	PN	ASME/ANSI		
1/2"	15	168	146	178	204	1/2"	15	169	179	179	199
3/4"	20	189	156.5	191	231	3/4"	20	200	202	202	223
1"	25	210	177	215	267	1"	25	208	213	213	257
1.1/4"	32	230	188	226	277	1.1/4"	32	242	240	240	-
1.1/2"	40	264	227	253	-	1.1/2"	40	261	252	252	-
2"	50	291	239	277	-	2"	50	334	320	320	-
2.1/2"	65	394	295	345	-	2.1/2"	65	408	359	359	-
3"	80	430	321	401	-	-	-	-	-	-	-

Configuration available: L4



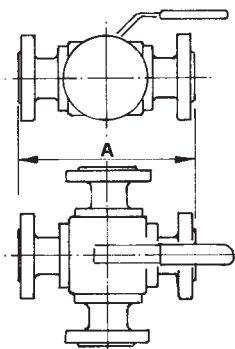
THREE WAY VERTICAL "L" PORT. FLANGED											
REDUCED BORE						FULL BORE					
VALVE SIZE		DIMENSION A (mm)				VALVE SIZE		DIMENSION A (mm)			
Inch.	DN	PN	ASME/ANSI			Inch.	DN	PN	ASME/ANSI		
1/2"	15	168	146	178	204	1/2"	15	169	179	179	199
3/4"	20	189	156.5	191	231	3/4"	20	200	202	202	223
1"	25	210	177	215	267	1"	25	208	213	213	257
1.1/4"	32	230	188	226	277	1.1/4"	32	242	240	240	-
1.1/2"	40	264	227	253	-	1.1/2"	40	261	252	252	-
2"	50	291	239	277	-	2"	50	334	320	320	-
2.1/2"	65	394	295	345	-	2.1/2"	65	408	359	359	-
3"	80	430	321	401	-	-	-	-	-	-	-

Configuration available: T8 - L7

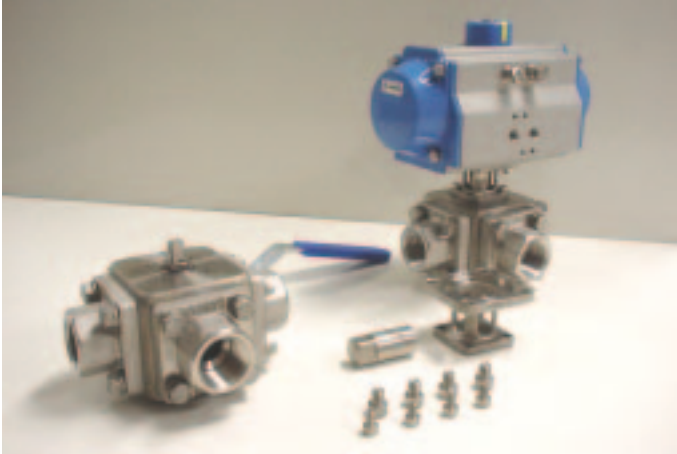


FOUR WAY "T" or "L" PORT. FLANGED											
REDUCED BORE						FULL BORE					
VALVE SIZE		DIMENSION A (mm)				VALVE SIZE		DIMENSION A (mm)			
Inch.	DN	PN	ASME/ANSI			Inch.	DN	PN	ASME/ANSI		
1/2"	15	168	146	178	204	1/2"	15	169	179	179	199
3/4"	20	189	156.5	191	231	3/4"	20	200	202	202	223
1"	25	210	177	215	267	1"	25	208	213	213	257
1.1/4"	32	230	188	226	277	1.1/4"	32	242	240	240	-
1.1/2"	40	264	227	253	-	1.1/2"	40	261	252	252	-
2"	50	291	239	277	-	2"	50	334	320	320	-
2.1/2"	65	394	295	345	-	2.1/2"	65	408	359	359	-
3"	80	430	321	401	-	-	-	-	-	-	-

Configuration available: X

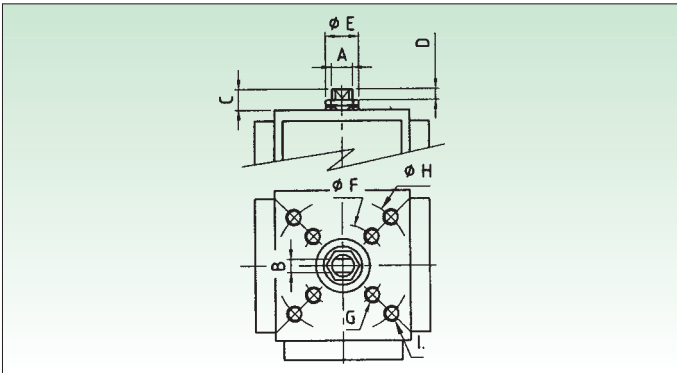


FOUR WAY "X" PORT. FLANGED									
REDUCED BORE					FULL BORE				
VALVE SIZE		DIMENSION A (mm)			VALVE SIZE		DIMENSION A (mm)		
Inch.	DN	PN	ASME/ANSI		Inch.	DN	PN	ASME/ANSI	
1/2"	15	169	179	179	1/2"	15	200	202	202
3/4"	20	200	202	202	3/4"	20	208	213	213
1"	25	208	213	213	1"	25	242	240	240
1.1/4"	32	242	240	240	1.1/4"	32	261	252	252
1.1/2"	40	261	252	252	1.1/2"	40	334	320	320
2"	50	334	320	320	2"	50	408	359	359
2.1/2"	65	408	359	359	-	-	-	-	-



HOW TO TRANSFORM A MANUAL OPERATED VALVE IN AUTOMATED VALVES

- 1) Take out the handle nut
- 2) Take out the handle
- 3) Fit again the handle nut



DIMENSIONS AND TORQUE TO SELECT ACTUATOR SUITABLE FOR STARLINE BALL VALVES

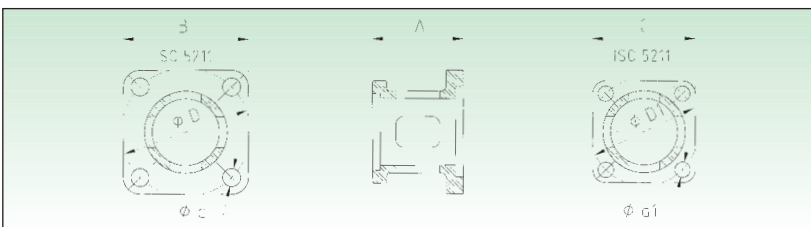
VALVE SIZE				TOP MOUNTING								BREAK AWAY TORQUE	
FULL BORE	RED. BORE	DIMENSION (mm)		DIMENSION (mm)									
Inch	DN	Inch	DN	A	B	C	D	ØE	ØF	G	ØH	I	Nm
1/4"	8	-	-	M10x1	5.5	10	5	16	36	M5x8	50	M6x8	18
3/8"	10	1/2"	15	M10x1	5.5	10	5	16	36	M5x8	50	M6x8	18
1/2"	15	3/4"	20	M12x1.25	7.5	21.5	9	21	42	M5x8	-	-	30
3/4"	20	1"	25	M12x1.25	7.5	18.5	10	21	42	M5x8	70	M8x10	42
1"	25	1.1/4"	32	M15x1.5	8.9	28	11	25	50	M6x8	70	M8x10	48
1.1/4"	32	1.1/2"	40	M15x1.5	8.9	22.5	12.5	25	50	M6x8	70	M8x10	59
1.1/2"	40	2"	50	M15x1.5	8.9	27	12	25	50	M6x8	70	M8x10	68
2"	50	2.1/2"	65	M22x1.5	16	27	16	35	70	M8x10	102	M10x12	102
2.1/2"	65	3"	80	M24x2	18	29	7	42	102	M10x12	-	-	122

- THIS TABLE IS NOT VALID FOR "X" PORT CONFIGURATION
 - BREAK AWAY TORQUE AT MAX. WORKING PRESSURE WITH SEATS TYPE PTFE + 25% C. GRAPHITE
 "S" FOR SEATS IN VIRGIN PTFE "T" -5%.
 -CONVERSION FACTORS: 1Nm= 0,7376 Lb-in / 1 lb.ft.= 1.365 Nm / 1 Nm= 8,86 Lb-in

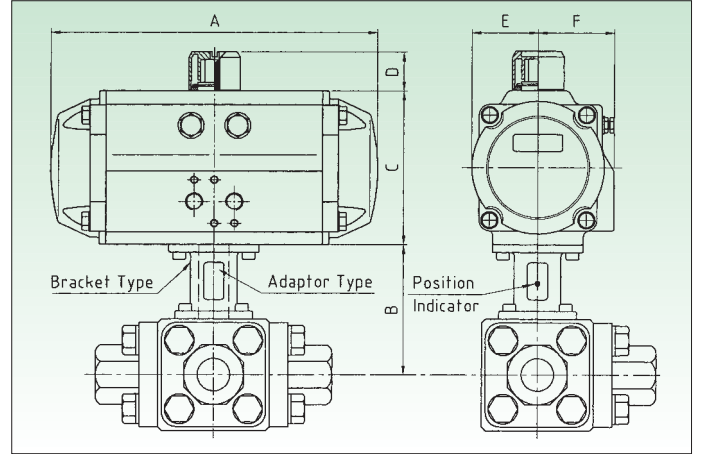
It must be understood that many factor can influence the torque of ball valves in field service. For this reason to SELECT PROPER ACTUATOR it must be used the "TORQUE ADJUSTMENT FACTORS" table no. A003/94.

NET BREAK AWAY TORQUE OF VALVES + PROCESS MEDIA + FREQUENCY OF OPERATION + PROCESS TEMPERATURE + VALVE SEATING MATERIAL + SUGGESTED SAFETY FACTOR = TORQUE TO SELECT ACTUATOR OR GEAR IN Nm

"STARLINE" BRACKETS ISO 5211 IN STAINLESS STEEL



TYPE OF BRACKET	DIMENSIONS (mm)							ISO 5211
	A	B	C	D	D1	d	d1	
ST1	35	48.5	36.5	42-50	36	6-7	6	F03/F04-F05
ST2	35	48.5	40	50	42	7	6	F04/F05
ST3	39	48.5	48.5	50	50	7	7	F05/F05
ST35	45	65.5	48.5	70	50	9	7	F05/F07
ST4	45	65.5	65.5	70	70	9	9	F07/F07
ST5	56	92	92	102	102	11	11	F10/F10



THREE & FOUR WAY n° 8 - 9 TABLE FOR AUTOMATION

VALVE SIZE				DOUBLE ACTING ACTUATOR									
FULL BORE	RED. BOR	ISO		DIMENSIONS (mm)						ACTUATOR TYPE	Bracket Type	Adaptor Type	
Inch	DN	Inch	DN	5211	A	B	C	D	E	F			
1/4"	8	-	-	F03	158.5	64.5	85	20	36	47	AT 101 DA ISO F05-CH14	ST1	A1/B
3/8"	10	1/2"	15	F03	158.5	64.5	85	20	36	47	AT 101 DA ISO F05-CH14	ST1	A1/B
1/2"	15	3/4"	20	F04	210.5	64	102	20	42.5	52	AT 201 DA ISO F05/F07-CH14	ST2	A2/B
3/4"	20	1"	25	F04	210.5	74	102	20	42.5	52	AT 201 DA ISO F05/F07-CH14	ST2	A2/C
1"	25	1.1/4"	32	F05	210.5	81	102	20	42.5	52	AT 201 DA ISO F05/F07-CH14	ST3	A3/E
1.1/4"	32	1.1/2"	40	F05	247.5	91	115	20	49.5	56.8	AT 251 DA ISO F05/F07-CH17	ST3	A3/F
1.1/2"	40	2"	50	F05	268.5	101	127	20	56	67	AT 301 DA ISO F05/F07-CH17	ST35	A3/G
2"	50	2.1/2"	65	F07	268.5	109	127	20	56	67	AT 301 DA ISO F05/F07-CH17	ST4	A4/H
2.1/2"	65	3"	80	F10	345	151	157	30	69.5	82	AT 401 DA ISO F07/F10-CH22	ST5	A5/C

VALVE SIZE				SPRING RETURN ACTUATOR									
FULL BORE	RED. BOR	ISO		DIMENSIONS (mm)						ACTUATOR TYPE	Bracket Type	Adaptor Type	
Inch	DN	Inch	DN	5211	A	B	C	D	E	F			
1/4"	8	-	-	F03	210.5	64.5	102	20	42.5	52	AT 201 S10 ISO F05/F07-CH14	ST1	A1/B
3/8"	10	1/2"	15	F03	210.5	64.5	102	20	42.5	52	AT 201 S10 ISO F05/F07-CH14	ST1	A1/B
1/2"	15	3/4"	20	F04	247.5	64	115	20	49.5	56.8	AT 251 S10 ISO F05/F07-CH17	ST2	A2/E
3/4"	20	1"	25	F04	268.5	74	127	20	56	67	AT 301 S10 ISO F05/F07-CH17	ST2	A2/F
1"	25	1.1/4"	32	F05	268.5	81	127	20	56	67	AT 301 S10 ISO F05/F07-CH17	ST3	A3/A
1.1/4"	32	1.1/2"	40	F05	268.5	91	127	20	56	67	AT 301 S10 ISO F05/F07-CH17	ST3	A3/F
1.1/2"	40	2"	50	F05	345	101	157	30	69.5	82	AT 401 S10 ISO F07/F10-CH22	ST35	A4/C
2"	50	2.1/2"	65	F07	345	109	157	30	69.5	82	AT 401 S10 ISO F07/F10-CH22	ST4	A4/I
2.1/2"	65	3"	80	F10	437	151	196	30	88	99	AT 501 S10 ISO F10/F12-CH27	ST5	A5/D

General Remarks:

- 1) The above actuators have been selected considering an air supply of 80 psi or 5,6 bar.
- 2) On spring return actuators the N. of spring per side is 5.
- 3) For different air supply please see Air Torque Catalogue.
- 4) Bracket and adaptor are dimensioned to fit Air Torque actuators.
- 5) When air supply for actuator is lower than 5,6 bar bigger actuator must be selected and bracket plus adaptor become special