1000 and 1000A Series
2 Way Control Valves

Description

The Spirax Sarco Hiter 1000/1000A Series is a 2 way control valve built to provide fine control and easy adjustment in a compact design. Available in a wide variety of body ratings, sizes and materials, it is designed to efficiently control a wide range of fluids in numerous types of processes and industrial facilities.
Spirax Sarco Hiter 1000/1000A Series are available in diameters from ½" to 24" and pressure classes up to ASME 16.34 CL2500# in both globe and angle body patterns.

Applications

Oil & Gas Processes; Offshore Platforms; Refineries; Gas Storage and Transportation; Chemical Industry; Sugar and Ethanol; Power Generation, Pulp & Paper and any applications which requires a good control in large diameters and medium or high pressures,

Designed and manufactured in accordance to the requirements of the European Pressure Equipment Directive 2014/68/EU and carries the CE mark when so required and applicable.

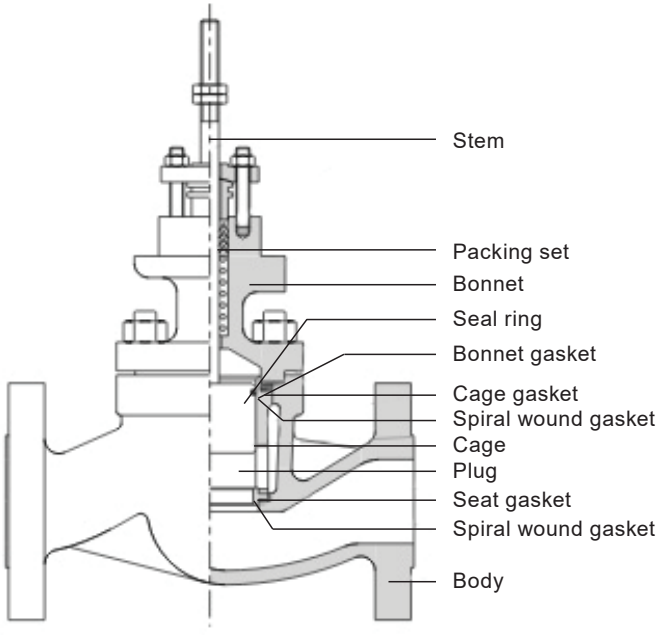
Series 1000 available versions

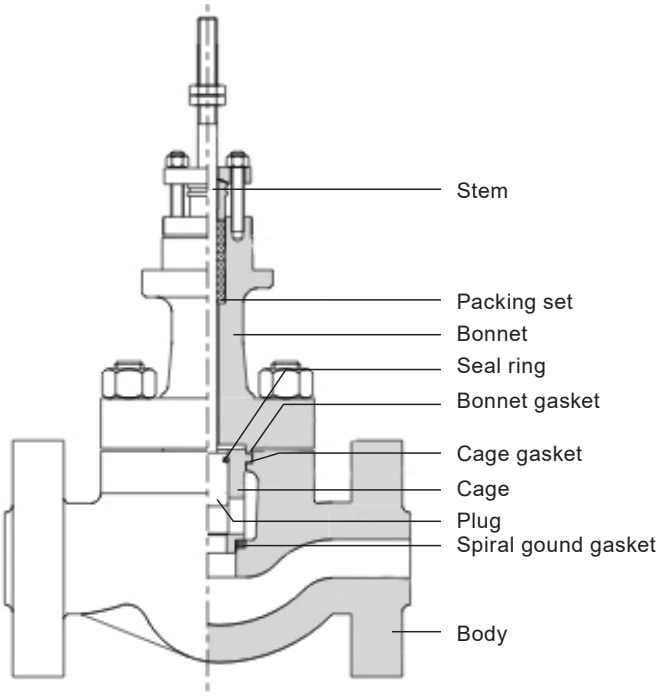
ASME B16.34 150, 300 or 600 Classes Sizes 6" to 24"		
Model type	1010	Globe body. Balanced plug, cage guided trim suitable for medium and large pressure drops. Standard seat leakage in accordance with ANSI FCI 70.2 Class IV. Classes V and VI are available upon request.
	1110	Globe body. Balanced plug, cage guided trim with resilient seat. Suitable for applications that require low seat leakage. Standard seat leakage in accordance with ANSI FCI 70.2 Class VI. Pressure drop limited to 300 psi g (21 bar).
	1210	Globe body. Balanced plug, cage guided trim, with double metal seat, suitable for high temperatures and large pressure drops. Standard seat leakage in accordance with ANSI FCI 70-2 Class IV.
	1040	Angle body with balanced plug, cage guided trim. Suitable for medium and large pressure drops. Standard seat leakage in accordance with ANSI FCI 70.2 Class IV.
	1140	Angular body with balanced plug and cage guided trim with soft (PTFE) seat for use when low leakage is necessary. Standard seat leakage in accordance with ANSI FCI 70.2 is Class VI

Series 1000A available versions

ASME B16.34 900, 1500 or 2500 Classes Sizes ½" to 24"		
Model type	1010	Globe body. Balanced plug, cage guided trim suitable for medium and large pressure drops. Standard seat leakage in accordance with ANSI FCI 70.2 Class IV. Classes V and VI are available upon request.
	1070	Globe body. Micro flow plug and cage guided. Suitable for applications with low flow in medium or high pressure drops. Suitable also to high temperatures due to the metal seat. Standard seat leakage in accordance with ANSI FCI 70.2 Class IV. Class V is available upon request.
	1210	Globe body. Balanced plug, cage guided trim, with double metal seat, suitable for high temperatures and large pressure drops. Standard seat leakage in accordance with ANSI FCI 70-2 Class IV.

Main components





Technical specifications

		Type	Pressure class	Standard	Available size
End connections	**RF**	Flanged	ASME 150 to 600 ASME 900 to 2500	ASME 16.34	10” to 24” ½” to 24”
	RTJ	(Ring Type Joint)	ASME 150 to 600 ASME 900 to 2500	ASME 16.20	10” to 24” ½” to 24”
	SW	(Socket Weld)	ASME 900 to 2500	ASME B16.11	½” to 2”
	BW	(Butt Weld)	ASME 600 ASME 900 to 2500	ASME B16.25	10” to 24” 3” to 24”

Face to Face	**RF/RTJ**	ISA S75.08.01
	SW	ISA S75.08.03
	BW	ISA S75.08.05

	Material [1]	Range temperature [2]
Body material	Carbon Steel ASTM A216 WCB	-20 °F to 800 °F (-29 °C to 427 °C)
	Alloy steel Cr-Mo-V ASTM A217 WC9	-20 °F to 1100 °F (1) (-29 °C to 595 °C) [1]
	Stainless steel ASTM A351 CF8M	-20 °F to 1000 °F (1) (-29 °C to 538 °C) [1]

[1] At temperatures of 1000 °F (538 °C), only valves with welded connections should be used Different materials are available upon request

	Braided PTFE		Graphite	
Stem seal materials (Packing)	CE1 bonnet	CE3 bonnet	CE1 bonnet	CE3 bonnet
	-22 °F to 449.6 °F (-30 °C to 232 °C)	-213.8 °F to 572 °F (-101 °C to 300 °C)	-22 °F to 699.8 °F (-30 °C to 371 °C)	-94 °F to 1,202 °F (-70 °C to 650 °C)

	Seat, bonnet and cage gasket	Spiral wound gasket	Temperature limit
Gasket material combinations	Carbon and graphite fibers with NBR rubber (non-asbestos)	304 stainless steel and carbon and graphite fibers with NBR rubber (non- asbestos)	449 °F (232 °C)
	PTFE	304 stainless steel and PTFE	449 °F (232 °C)
	Expanded graphite laminate with stainless steel insert	Inconel and expanded graphite	1099 °F (593 °C)

Technical specifications

	Material	Temperature limit
Seal ring materials	BUNA	248 °F (120 °C)
	EPDM	248 °F (120 °C)
	Neoprene	302 °F (150 °C)
	PTFE	392 °F (200 °C)
	Viton	399 °F (204 °C)
	PTFE Graf.	446 °F (230 °C)
	SHT	482 °F (250 °C)
	CHEMRAZ	500 °F (260 °C)
	KALREZ	527 °F (275 °C)
	Graphite	1202 °F (650 °C)

Body to bonnet bolting

Stud material	ASTM A193 Gr. B7	-20,2 °F to 800,6 °F (-29 °C to 427 °C)
	ASTM A193 Gr. B8M	-425,2 °F to 800,6 °F (-254 °C to 427 °C)
	ASTM A193 Gr. B16	802,4 °F to 1.099,4 °F (428 °C to 593 °C)
Nut material	ASTM A194 Gr. 2H	-20,2 °F to 800,6 °F (-29 °C to 427 °C)
	ASTM A194 Gr. 8M	-425,2 °F to 800,6 °F (-254 °C to 427 °C)
	ASTM A194 Gr. 7	802,4 °F to 1.099,4 °F (428 °C to 593 °C)
Pressure and temperature limits	By ASME B16.34	

Trim materials

	Plug/ Seat	Cage	Seal ring	Max. ΔP.	Temperature range
Type 1010 1040 **ASME 150 to 600**	316 stainless steel	410 stainless steel hardened	See seal ring table above	305 psi (21 bar)	-20.2 °F to 578 °F (-29 °C to 275 °C)
	316 stainless steel	17.4 PH stainless steel hardened			-213 °F to 600 °F (-101 °C to 316 °C)
	410 stainless steel hardened			1500 psi (103.4 bar)	-20 °F to 788 °F (-29 °C to 420 °C)
	316 stainless steel with Stellite coating	316 stainless steel with Stellite face			790 °F to 1,050 °F (421 °C to 566 °C)

Trim materials

	Plug/seat	Cage	Seal ring	Max. ΔP.	Temperature range
Type 1110 1140 ASME 150 to 600	316 stainless steel with PTFE	410 stainless steel hardened	See seal ring table above	305 psi (21 bar)	-20 °F to 248 °F (-29 °C to 120 °C)
					-13 °F to 392 °F (-29 °C to 120 °C)
		17.4 PH stainless steel hardened		305 psi (21 bar)	-20 °F to 248 °F (-29 °C to 120 °C)
					-13 °F to 392 °F (-29 °C to 120 °C)

	Plug/seat	Cage	Max. ΔP.	Temperature range
Type 1210 ASME 150 to 600	316 stainless steel	410 stainless steel hardened	305 psi (21 bar)	-20 °F to 600 °F (-29 °C to 316 °C)
		17.4 PH stainless steel hardened		-150F to 600 °F (-101 °C to 316 °C)
	316 stainless steel with Stellite coating	17.4 PH stainless steel hardened	1450 psi (100 bar)	-102 °F to 199 °F (39 °C to 93 °C)
	316 stainless steel with Stellite coating	316 stainless steel with Stellite face	1500 psi (103.4 bar)	-20 °F to 788 °F (-29 °C to 420 °C)

	Plug/seat	Cage	Seal ring	Max. ΔP.	Temperature range
Type 1010 ASME 900 to 2500	316 stainless steel		See seal ring table above	305 psi (21 bar)	-20 °F to 248 °F (-29 °C to 120 °C)
					-13 °F to 392 °F (-29 °C to 120 °C)
	316 stainless steel with Stellite coating	410 stainless steel hardened		6250 psi (430 bar)	-20 °F to 248 °F (-29 °C to 120 °C)
	316 stainless steel with Stellite coating	17.4 PH stainless steel hardened			-13 °F to 392 °F (-29 °C to 120 °C)
	410 stainless steel hardened			600 psi (42 bar)	20 °F to 1099 °F (-29 °C to 593 °C)
	316 stainless steel with Stellite coating	316 stainless steel with Stellite face			

	Plug/seat	Cage	Seal ring	Max. ΔP.	Temperature range
Type 1070 1210 ASME 900 to 2500	316 stainless steel with Stellite coating	17.4 PH stainless steel hardened	N/A	1100 psi (75 bar)	-20 °F to 248 °F (-29 °C to 120 °C)
	17.4 PH stainless steel hardened			6250 psi (430 bar)	-20 °F to 1099 °F (- 29 °C to 593 °C)
	410 stainless steel hardened				
	410 stainless steel hardened			6000 psi (413 bar)	20 °F to 1099 °F (-29 °C to 593 °C)
	316 stainless steel with Stellite coating	Nitrided Cr-Mo Alloy-Steel with Stellite Coating			

Flow coefficients

Flow coefficient range

LV-Linear
PV-Equal percentage
MV-Modified parabolic
1R, 2R, 3R, 4R-Low noise 1, 2, 3 and 4 stages respectively
1K, 2K, 3K – Anti-cavitation 1,2 and 3 stages respectively

Flow coefficient-C_v

Types 1010 1110 1210

ASME CL 150 to 600

Body size (inch)	Flow characteristic									
	LV	PV	MV	1R	2R	3R	4R	1K	2K	3K
10	450-1350	400-1170	180-1200	218-760	315-500	212-617	80-208	184-515	168-393	120-330
12	650-1640	490	400-1062	587-1050	533-693	360-468	270-350	289-610	210-490	150-360
14	1050-1830	1700	950-1800	846-1400	693-900	468-608	270-380	338-900	251-586	186-434
16	1900-2720	2230	1500-2000	1217-1700	693-2100	468-1300	380-430	581-2350		
18	3800-5000	3300	3450		1500			2800		
20	4700	4270	4100	3200				2700-3500		
24	7300	6350	6650							

Flow coefficient-C_v

Types 85-51 85-61 85-71

Body size (inch)	Flow characteristic									
	LV	PV	MV	1R	2R	3R	4R	1K	2K	3K
10	527-1580	468-1369	1034-1404	255-889	369-585	248-722	94-243	216-603	197-460	140-386
12	761-1919	573	468-1243	687-1229	624-811	421-548	316-410	338-715	246-573	176-421
14	1229-2141	1989	1112-2106	990-1638	811-1053	548-711	316-445	396-1053	294-686	218-508
16	2223-3182	2609	1755-2340	1424-1989	811-2457	548-1521	445-503	680-2750		
18	4446-5850	3861	4037		1755			3276		
20	5499	4996	4797	3744				3159-4095		
24	8541	7430	7781							

Flow coefficient-C_v

Types 1010 1020 1210

ASME CL 900

Body size (inch)	Flow characteristic									
	LV	PV	MV	1R	2R	3R	4R	1K	2K	3K
1	12	10	11	2,7				8		
1,5	13-22	11-18	12-20	18-26				9 – 13	4-8	3-6
2	25-41	21-36	20-36	30-48				15 – 27	8-18	5-15
3	45-131	39-115	39-120	100	12-74	43		17 – 67	24-37	14-33
4	22-180	125-155	89-170	80-178	74-155	56-95	56	77 – 121	50-70	22-81
6	195-290	168-250	180-270	180-286	125-212	73-155	73-96	140 – 180	76-152	72-145
8	310-520	280-448	283-470	350-380	163-275	125-200	96-150	207 – 235	100-250	96-241
10	525-950	450-820	485-884	520-710	212-464	125-340	150-212	270 – 441	189-441	145
12	635-1150	530-960	570-1030	1000						
14	930-1690	780-1410	840-1520							
16	1060-2050	890-1610	960-1740							

Flow coefficients

Flow coefficient-C_v

Types 1010
1020
1210

ASME CL 1500

Body size (inch)	Flow characteristic									
	LV	PV	MV	1R	2R	3R	4R	1K	2K	3K
1	12	10	11					8		
1,5	13-22	11-18	12-20	18-26				9 – 13	4-8	3-6
2	25-41	21-36	20-42	30-48				15 – 27	8-18	5-15
3	45-96	39-82	39-85	35-93	44-74	38		17 – 64	23-39	10-35
4	40-170	86-145	89-150	154	74-155	50-120	56	74 – 113	46-81	27-75
6	120-265	155-228	160-235	200-280	163-212	65-143	73	130-168	70-141	35-134
8	276-480	240-405	250-390	360	163-275	85-200	125-150	194-220	96-242	96-241
10	508-1030	428-760	405-770	678	212-440	100-310	150-350	253-412	176-411	171-399
12	615-1110	500-900	500-900					474-489	209-490	204- 477
14	870-1570	725-1310	820-1480							
16	995-1800	830-1500	885-1600							

Flow coefficient-C_v

Types 1010
1020
1210

ASME CL 2500

Body size (inch)	Flow characteristic									
	LV	PV	MV	1R	2R	3R	4R	1K	2K	3K
1	11	9	10					8		
1,5	11-16	9-13	10-14					9-10		
2	17-30	14-26	15-26	15-42				11-23	8-15	7 – 12
3	32-70	27-60	30-63	77	28-61	22		26-53	18-31	16-27
4	74-104	63-90	70-95	141	47-80	29-48	45	60-90	36-63	46-81
6	110-177	95-150	105-157	217	61-205	38-150	56-73	103-137	57-114	51-103
8	187-360	158-330	166-350	290	135-615	110-175	73-130	158-180	76-190	75-181
10	380-750	350-628	370-800	542	175-390	186-280	130-180	207-341	145-338	140-326
12	1090		920							

Flow coefficient-C_v

Types 1070

ASME
Class 900 to 2500

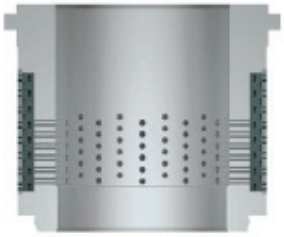
Body size (inch)			Orifice code	Linear	Equal percentage	Modified parabolic
1"	¾"	½"	M1			0.25
			M2			0.4
			M3	0.85	0.85	0.85
			M4	2	2	2
			M5	3.4	3.4	3.4
			M6	5.5	5.5	5.5
			M7	7.5	7.5	7.5
			M8	10.6	10.6	10.6
			M9	13	13	13

Seat leakage class

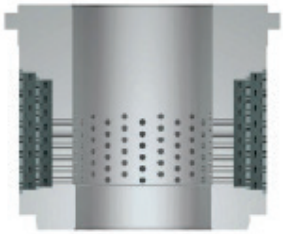
	Valve type	Leakage class	Note
Leakage Class – FCi 70.2	1010	IV or V	With balance seal ring in elastomer
	1040		
	1210	IV	Metal seat
	1110	VI	With PTFE seat
	1140		
	1070	IV or V	Metal seat
	1090		

Special trims

1R-1 Stage



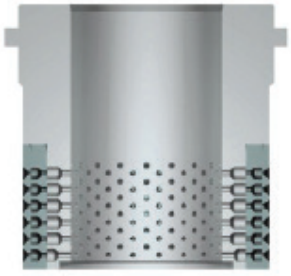
2R-2 Stage



3R-3 Stage

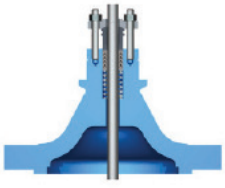
1K – 1 Stage

2K – 2 Stage



3 Stage

Bonnet types



CE-1 standard bonnet

CE-3 extended bonnet

CE- 4 bellows sealed bonnet

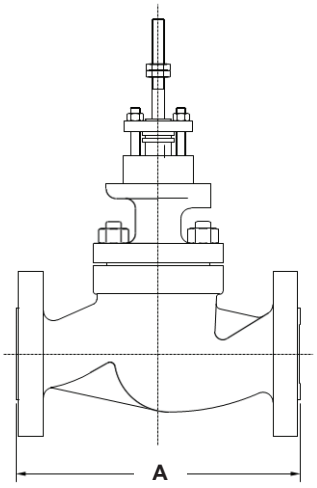
Sizes and weights

Valve size	S1000				S1000A					
	ASME CL 150/300		ASME CL 600		ASME CL 900		ASME CL 1500		ASME CL 2500	
	FLG	BW/SW/ THRD	FLG	BW/SW/ THRD	FLG	BW/SW/ THRD	FLG	BW/SW/ THRD	FLG	BW/SW/ THRD
½"	14 kg (31 lb)	12 kg (26 lb)	18 kg (40 lb)	16 kg (35 lb)	40 kg (88 lb)	35 kg (77 lb)	44 kg (97 lb)	40 kg (88 lb)		
¾"	14 kg (31 lb)	12 kg (26 lb)	18 kg (40 lb)	16 kg (35 lb)	40 kg (88 lb)	35 kg (77 lb)	44 kg (97 lb)	40 kg (88 lb)	60 kg (132 lb)	50 kg (110 lb)
1"	14 kg (31 lb)	12 kg (26 lb)	18 kg (40 lb)	16 kg (35 lb)	40 kg (88 lb)	35 kg (77 lb)	44 kg (97 lb)	40 kg (88 lb)	60 kg (132 lb)	50 kg (110 lb)
1½"	26 kg (57 lb)	24 kg (53 lb)	28 kg (62 lb)	26 kg (57 lb)	50 kg (110 lb)	35 kg (77 lb)	55 kg (121 lb)	40 kg (88 lb)		
2"	40 kg (88 lb)	36 kg (79 lb)	46 kg (101 lb)	40 kg (88 lb)	60 kg (132 lb)	45 kg (99 lb)	60 kg (132 lb)	45 kg (99 lb)		
3"	75 kg (165 lb)	68 kg (150 lb)	85 kg (187 lb)	75 kg (165 lb)	120 kg (265 lb)	100 kg (220 lb)	130 kg (287 lb)	100 kg (220 lb)	240 kg (529 lb)	200 kg (441 lb)
4"	110 kg (242 lb)	90 kg (198 lb)	120 kg (264 lb)	95 kg (209 lb)	205 kg (452 lb)	170 kg (375 lb)	220 kg (485 lb)	180 kg (397 lb)	400 kg (882 lb)	350 kg (772 lb)
6"	192 kg (423 lb)	165 kg (364 lb)	240 kg (529 lb)	190 kg (397 lb)	420 kg (926 lb)	350 kg (772 lb)	480 kg (1058 lb)	380 kg (838 lb)		
8"	370 kg (816 lb)	322 kg (710 lb)	440 kg (970 lb)	364 kg (802 lb)	630 kg (1389 lb)	520 kg (1146 lb)	760 kg (1675 lb)	600 kg (1323 lb)		
10"	550 kg (1212 lb)	460 kg (1014 lb)	620 kg (1367 lb)	522 kg (1151 lb)	1050 kg (2315 lb)	860 kg (1896 lb)	1200 kg (1645 lb)	940 kg (2072 lb)	2200 kg (4850 lb)	1900 kg (4189 lb)
12"	752 kg (1658 lb)	700 kg (1543 lb)	960 kg (2116 lb)	810 kg (1786 lb)	1300 kg (2866 lb)	1120 kg (2469 lb)				
14"	1242 kg (2738 lb)	1180 kg (2601 lb)	1388 kg (3060 lb)	1230 kg (2712 lb)			1700 kg (3748 lb)	1500 kg (3307 lb)		
16"	1548 kg (3413 lb)	1480 kg (3263 lb)	1725 kg (3803 lb)	1515 kg (3340 lb)						
18"	1720 kg (3792 lb)	1640 kg (3616 lb)								
20"	3280 kg (7231 lb)	3000 kg (6614 lb)	4180 kg (9215 lb)	3800 kg (8378 lb)						
24"	5200 kg (11464 lb)	4900 kg (10803 lb)	6200 kg (13669 lb)	5960 kg (13140 lb)						

Dimensions (approximate) in inches and mm

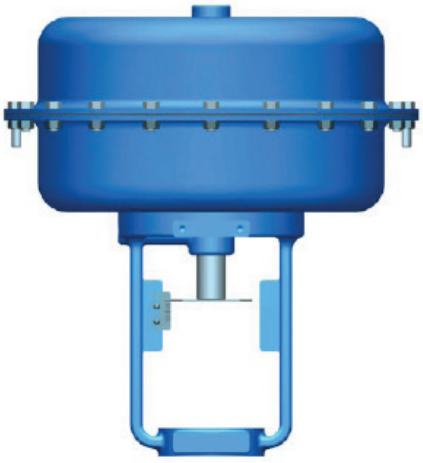
Body Size (in)	A Flanged Body inch (mm)											
	Series 1000						Series 1000A					
	150#		300#		600#		900#		1500#		2500#	
	FR	RTJ	FR	RTJ	FR	RTJ	FR	RTJ	FR	RTJ	FR	RTJ
½"	See Series 85						10.7" (273)	10.7" (273)	10.7" (273)	10.7" (273)		
¾"							10¼" (260)**	10¼" (260)**	10¼" (260)**	10¼" (260)**	12½" (318)	12½" (318)
1"							10¼" (260)**	10¼" (260)**	10¼" (260)**	10¼" (260)**	12½" (318)	12½" (318)
1½"							13.1" (333)	13.1" (333)	13.1" (333)	13.1" (333)		
2"							14.8" (375)	14.8" (375)	14.8" (375)	14.8" (375)		
3"							15½" (394)**	17.5" (444)	16 17/64" (413)**	16⅜" (416)**	19.6" (499)	19⅞" (505)**
4"							20.1" (511)	20.2" (513)**	20.9" (530)	20.9" (532)**	28.9" (735)	29.3" (745)**
6"							28.1" (714)	28.3" (719)**	30.2" (768)	30.4" (773)		
8"							36" (914)	31.5/8" (803)**	38.2" (972)	38.7" (982)		
10"	26½" (673)	27" (686)	27⅞" (708)	28½" (724)	29⅝" (752)	29¾" (756)	39" (991)	39.1" (993)	42" (1067)	42.4" (1077)	54.1" (1374)	54.8" (1393)**
12"	29" (737)	29½" (749)	30½" (775)	31 7/64" (790)	32¼" (819)	32⅜" (823)	44.5" (1130)	44.6" (1133)				
14"	35" (889)	35½" (902)	36½" (927)	37⅛" (943)	38¼" (972)	38⅜" (975)			49.5" (1257)	50.2" (1276)		
16"	40" (1016)	40½" (1029)	41⅝" (1057)	42¼" (1073)	43⅝" (1108)	43¾" (1111)						
18"	45" (1143)		46.7" (1187)									
20	49.9" (1267)				54" (1372)							
24	60" (1524)				65.9" (1676)							

** Face to face as per Manufacturer Standard



Actuators

The Spirax Sarco Hiter 1000/1000A Series control is normally actuated by a Hiter DC spring and diaphragm actuator or Hiter PP piston actuator.
Series 1000 / 1000A valves can also be supplied with electric or hydraulic actuators.
Please contact Spirax Sarco for your specific requirements.



DC Series
Spring and Diaphragm Actuator

PP Series
Piston Actuator

Positioners

The Spirax Sarco Hiter 1000/1000A Series control valves are available with the complete range of Spirax Sarco positioners. Alternative positioners are also available. Please contact Spirax Sarco for your specific requirements.

Series 85 selection guide

Series	1000 and 1000A	1000A
Types	1010, 1110, 1210, 1040, 1140, 1090	1010
Valve size	½", 1", ¾" 1½", 2", 3", 4", 6", 8" 10" 12" 14", 16", 18", 20", 24"	4"
Class	150, 300, 600, 900, 1500, 2500	1500
Body material	WCB-Carbon Steel ASTM A216 WCB WC9-Alloy Steel Cr-Mo-V ASTM A217 WC9' CF8M-Stainless Steel ASTM A351 CF8M	WCB
Trim materials	316 stainless steel 17/4PH stainless steel hardened 410 stainless steel hardened 316 stainless steel with Stellite coating	410
Bonnet type	CE1 CE3 CE4	CE1
Stem seal material	Braided PTFE Graphite	Graphite

Order Example

1000A	1010	4"	1500#	WCB	410	CE1	Graphite