



by **HITER**

85 Series 2 Way Control Valves

Description

The Spirax Sarco Hiter 85 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 85 Series are available in diameters from ½" to 8" and pressure classes up to ASME 16.34 600#, adaptable to many applications due to the clamp in place seat technology.

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 low to medium pressure ranges.

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 85 available versions

ASME B16.34 150, 300 or 600 Classes Sizes 1" to 8"

Model type	Description
85-51	Globe body. Balanced plug, cage guided trim suitable for medium and large pressure drops. Standard seat leakage in accordance with ANSI FCI 70.2 is Class IV. Class V available upon request.
85-61	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 is Class VI.
85-70	Globe body. Unbalanced plug, cage guided trim suitable for low and medium pressure drops. Standard seat leakage in accordance with ANSI FCI 70 is Class IV. Class V available upon request.
85-71	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 is Class IV.

ASME B16.34 150, 300 or 600 Classes Sizes 1½" to 4"

Model type	Description
85-58	Globe body. Unbalanced top-guided plug, metal seat suitable for low and medium pressure drops. Standard seat leakage in accordance with ANSI FCI 70.2 is Class IV. Class V is available upon request.
85-68	Globe body. Unbalanced top-guided plug with resilient seat. Suitable for applications that require low seat leakage. Standard seat leakage in accordance with ANSI FCI 70.2 is Class VI.

ASME B16.34 150, 300 or 600 Classes Sizes ½" to 2"

Model type	Description
85-52	Globe body. Unbalanced top-guided micro-flow plug, metal seat suitable for low flow rates. Standard seat leakage in accordance with ANSI FCI 70.2 is Class IV. Class V available upon request.
85-62	Globe body. Unbalanced top-guided micro-flow plug with resilient seat. Suitable for applications that require low seat leakage. Standard seat leakage in accordance with ANSI FCI 70.2 is Class VI.

Technical specifications

	Type	Pressure class	Standard	Available size	
Connections	FR	(Raised face)	150# to 600#	ASME 16.34	½" to 8"
	RC	(NPT)	150# to 600#	ASME B1.20.1	½" to 2"
	SW	(Socket weld)	150# to 600#	ASME B16.11	½" to 2"
	BW	(Butt weld)	150# to 600#	ASME B16.25	3" to 8"
Face to face	RF	(Raised face)	150# to 600#	ISA S75.08.01	½" to 8"
	RC/SW	(NPT/Socket weld)	150# to 600#	ISA S75.08.03	½" to 2"
	BW	(Butt weld)	150# to 600#	ISA S75.08.05	3" to 8"

	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 (-29 °C to 595 °C) ⁽²⁾
	Stainless steel ASTM A351 CF8M	-20 °F to 1000 °F (-29 °C to 538 °C) ⁽²⁾

⁽¹⁾ Different materials are available on request including; Duplex, Nickel Alloys, Titanium Alloys
⁽²⁾ Class #150 flanged end valve limited to 1000 °F 538 °C

	Model reference	Temperature range
Bonnet types	CE1 Standard bonnet	Standard bonnet for use with temperatures up to 662 °F (350 °C)
	CE3 Extended bonnet	Extended bonnet for use with temperatures up to 1100 °F (595 °C)
	CE4 Bellows seal bonnet	Extended with bellows for use with corrosive or dangerous fluids. For use with temperatures up to 662 °F (350 °C)

	Braided PTFE		Graphite	
Stem seal materials (Packing)	CE1 bonnet	CE3 bonnet	CE1 bonnet	CE3 bonnet
	-22 °F to 698 °F (-30 °C to 232 °C)	-150 °F to 572 °F (101 °C to 300 °C)	-22 °F to 689 °F (-30 °C to 370 °C)	-94 °F to 1202 °F (-70 °C to 650 °C)

	Seat, bonnet and cage gasket	Spiral wound gasket	Temperature limit
Gasket material combinations	Synthetic fibers with NBR rubber (non-asbestos)	304 stainless steel and carbon and graphite fibers with NBR rubber (non- asbestos)	347 °F (175 °C)
	Carbon and graphite fibers with NBR rubber (non-asbestos)	304 stainless steel and carbon and graphite fibers with NBR rubber (non- asbestos)	410 °F (210 °C)
	PTFE	304 stainless steel and PTFE	450 °F (232 °C)
	Expanded graphite laminate with stainless steel insert	Inconel and expanded graphite	1100 °F (593 °C)

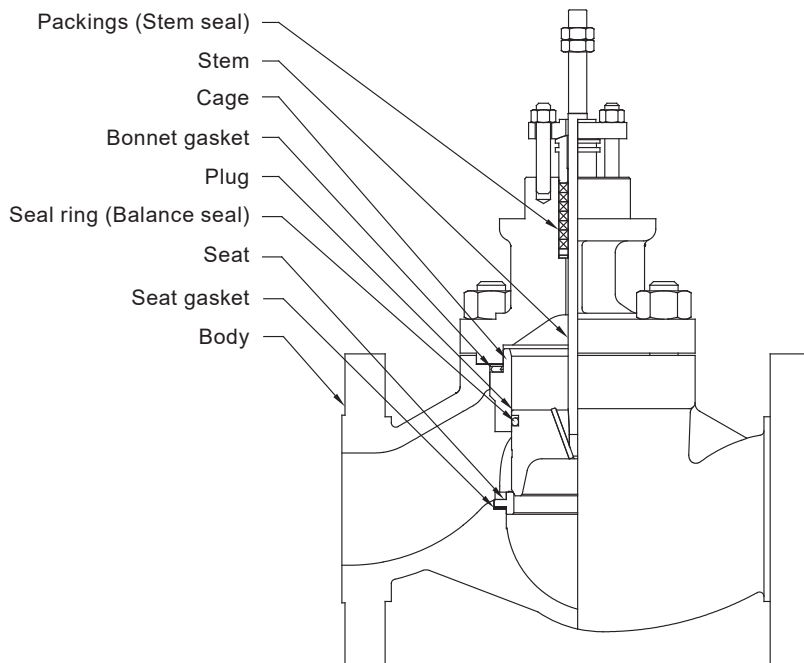
Technical specifications

	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)

Series 85 main components



Trim materials

	Plug/ Seat		Cage	Seal ring	Max. ΔP.	Temperature range
Type 85-51	316 stainless steel		17.4 PH stainless steel hardened		300 psi (20,68 bar)	-20.2 °F to 578 °F (-29 °C to 275 °C)
ASME B16.34 CL 150 to 600	410 stainless steel hardened		410 stainless steel hardened	See seal ring table above	300 psi (20,68 bar)	20.2 °F to 788 °F (-29 °C to 420 °C)
	316 stainless steel with Stellite coating		Nitrided Cr-Mo Alloy steel		1500 psi (103,42 bar)	790 °F to 1,050 °F (421 °C to 566 °C)
	Plug	Seat	Cage	Seal ring	Max. ΔP.	Temperature range
Type 85-61	316 stainless steel	316 stainless steel (CF8M) with PTFE	17-4PH stainless steel hardened	See seal ring table above	300 psi (20,68 bar)	-20.2 °F to 392 °F (-29 °C to 200 °C)
ASME B16.34 CL 150 to 600						
	Plug/ Seat		Cage		Max. ΔP.	Temperature range
Type 85-70	316 stainless steel		17.4 PH stainless steel hardened		1400 psi (96,53 bar)	-20.2 °F to 578 °F (-29 °C to 275 °C)
ASME B16.34 CL 150 to 600	410 stainless steel hardened		410 stainless steel hardened		300 psi (20,68 bar)	20.2 °F to 788 °F (-29 °C to 420 °C)
	316 stainless steel with Stellite coating		Nitrided Cr-Mo Alloy steel		1500 psi (103,42 bar)	790 °F to 1,050 °F (421 °C to 566 °C)
	Plug/ Seat		Cage		Max. ΔP.	Temperature range
Type 85-71	316 stainless steel		17.4 PH stainless steel hardened		1400 psi (96,53 bar)	-150 °F to 600 °F (-101 °C to 316 °C)
	410 stainless steel hardened		410 stainless steel hardened		1500 psi (103,42 bar)	-20.2 °F to 788 °F (-29 °C to 420 °C)
	316 stainless steel with Stellite coating	316 stainless steel Stellite coating with Stellite face and seat bore	Nitrided Cr-Mo Alloy steel		1500 psi (103,42 bar)	790 °F to 1,050 °F (421 °C to 566 °C)
ASME B16.34 CL 150 to 600						
	Plug/ Seat		Bushing guide		Max. ΔP.	Temperature range
Type 85-52 and 85-58	316 stainless steel		17.4 PH stainless steel hardened		1400 psi (96,53 bar)	-150 °F to 600 °F (-101 °C to 316 °C)
	316 stainless steel with Stellite coating	316 stainless steel Stellite coating with Stellite face and seat bore	316 stainless steel Stellite coating with Stellite face		1500 psi (103,42 bar)	20.2 °F to 788 °F (-29 °C to 420 °C)
	410 stainless steel hardened		410 stainless steel hardened		1500 psi (103,42 bar)	790 °F to 1,050 °F (421 °C to 566 °C)
ASME B16.34 CL 150 to 600						
	Plug	Seat	Bushing guide		Max. ΔP.	Temperature range
Type 85-62 and 85-68	316 stainless steel with Stellite coating	316 stainless steel with PTFE	17.4 PH stainless steel hardened		300 psi (20,68 bar)	128 °F to 392 °F (-89 °C to 200 °C)
ASME B16.34 CL 150 to 600						

Flow coefficients

Flow Characteristic
 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	Body size (inch)	Flow characteristic									
		LV	PV	MV	1R	2R	3R	4R	1K	2K	3K
Types 85-51 85-61 85-71	1"	19	17	11	18				11	4-6	
	1½"	38-23	34-22	20-12	18-33	13-25			12-20	5-10	3-7
	2"	63-30	52-26	40-12	22-63	17-50	10-26		14-35	8-23	2-16
	3"	130-88	118-57	120-32	38-125	50-85	20-57	24-32	20-90	27-45	21-35
	4"	215-105	200-95	150-20	52-190	65-143	57-125	14-72	52-170	53-80	37-56
	6"	410-155	390-140	310-64	350-104	242-85	212-96	120-72	176-51	138-69	95-48
	8"	870-260	820-210	820-118	665-400	415-186	365-125	212-94	215-104	210-105	130-68

Flow coefficient - C_v	Body size (inch)	Flow characteristic									
		LV	PV	MV	1R	2R	3R	4R	1K	2K	3K
Types 85-51 85-61 85-71	1"	19	17	11	18				11	4-6	
	1½"	38-23	34-22	20-12	18-33	13-25			12-20	5-10	3-7
	2"	63-30	52-26	40-12	22-63	17-50	10-26		14-35	8-23	2-16
	4"	130-88	118-57	120-32	38-125	50-85	20-57	24-32	20-90	27-45	21-35
	6"	215-105	200-95	150-20	52-190	65-143	57-125	14-72	52-170	53-80	37-56
	8"	410-155	390-140	310-64	350-104	242-85	212-96	120-72	176-51	138-69	95-48

Flow characteristic
 PC – Equal percentage
 MV – Modified parabolic
 LC - Linear

Flow coefficient - C_v	Body size (inch)		Flow characteristic	Orifice code	LC	PC	MV	
	1", 1½" and 2"	¾"						
Types 85-52 85-62		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	8
					M9	13	13	10

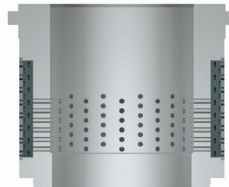
Flow characteristic	LC - Linear PC - Equal percentage MV - Modified Parabolic		
Flow coefficient - C_v Types 85-58 85-68	Body size (inch)	Flow characteristic	
		LC	PC
	1½"	17-23	
	2"	15-41	26-41
	3"	44-115	20-115
	4"	73-195	
Seat leakage class			
Leakage Class ANSI FCI 70-2	Valve type	Leakage class	Note
	85-51	IV or V	With balance seal ring in elastomer
	85-52	IV or V	Metal seat
	85-71	IV or V	
	85-58	IV	Metal seat
	85-61	VI	PTFE seat
	85-62		
85-68			

Special trims

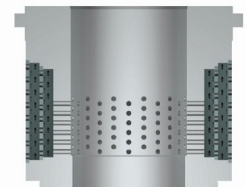
Noise control (R)



1R - 1 stage

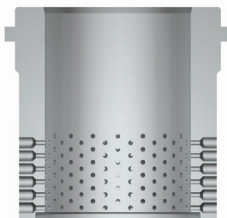


2R - 2 stages

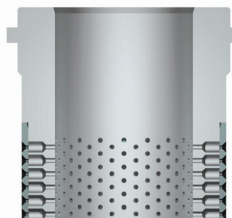


3R - 3 stages

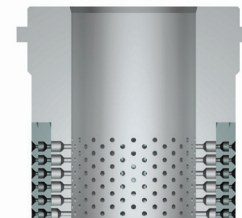
Cavitation control (K)



1K - 1 stage

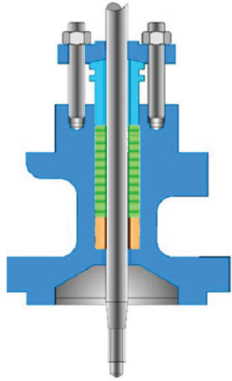


2K - 2 stage

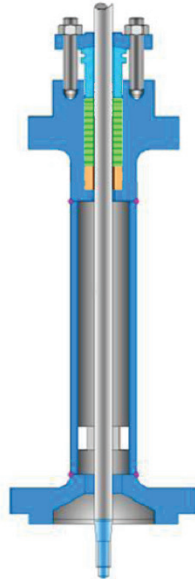


3 stage

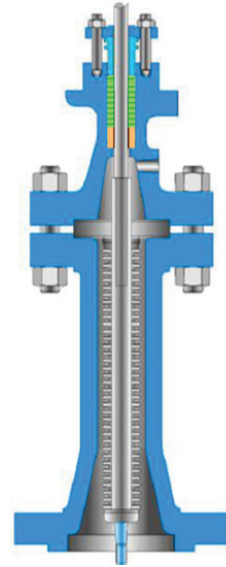
Bonnet types



CE-1 standard



CE-3 extended



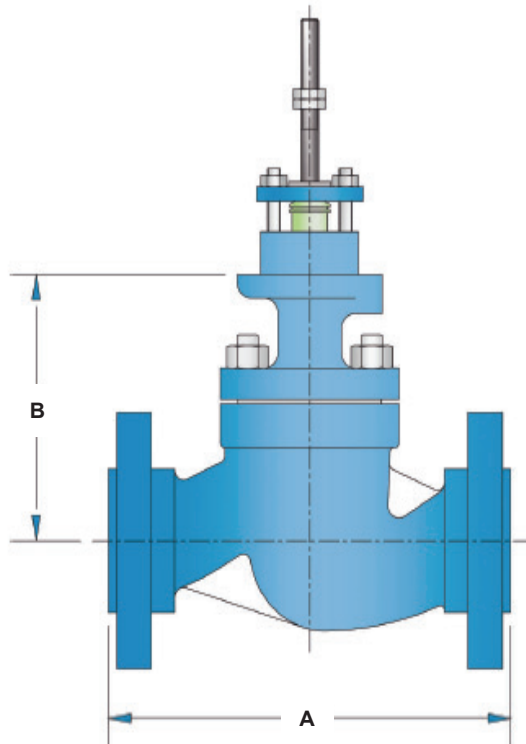
CE-4 extended with bellows

Sizes and weights

Valve size	ASME Class 150/300		ASME Class 600	
	FLG	BW/SW/THRD	FLG	BW/SW/THRD
1/2"	12 kg (26 lb)	10 kg (22 lb)	16 kg (36 lb)	14 kg (31 lb)
3/4"	16 kg (36 lb)	12 kg (26 lb)	17 kg (37 lb)	14 kg (31 lb)
1"	16 kg (36 lb)	12 kg (26 lb)	17 kg (37 lb)	14 kg (31 lb)
1 1/2"	22 kg (49 lb)	16 kg (36 lb)	24 kg (53 lb)	16 kg (36 lb)
2"	30 kg (66 lb)	22 kg (49 lb)	30 kg (66 lb)	22 kg (49 lb)
3"	60 kg (132 lb)	38 kg (84 lb)	60 kg (132 lb)	45 kg (99 lb)
4"	95 kg (209 lb)	60 kg (132 lb)	100 kg (220 lb)	65 kg (143 lb)
6"	170 kg (375 lb)	110 kg (242 lb)	210 kg (463 lb)	120 kg (265 lb)

Dimensions (approximate) in mm and in

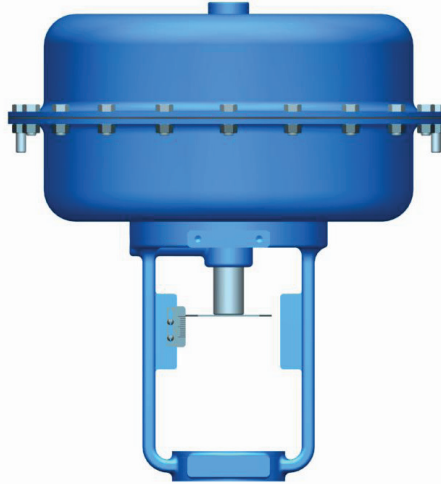
Valve Size	A - Flanged body (mm/in)			B (mm/in)		
	ANSI/ISA-S75.08.01			Bonnet type		
	150 Class	300 Class	600 Class	CE1	CE3	CE4
1/2"	184 (7 1/4")	190 (7 31/64")	203 (8")	136 (5 3/8")	232 (9 1/8")	360 (14 3/16")
3/4"	184 (7 1/4")	194 (7 41/64")	206 (8 7/64")	136 (5 3/8")	232 (9 1/8")	360 (14 3/16")
1"	184 (7 1/4")	197 (7 3/4")	210 (8 1/4")	136 (5 3/8")	232 (9 1/8")	308 (12 1/8")
1 1/2"	222 (8 3/4")	235 (9 1/4")	251 (9 7/8")	149 (5 7/8")	302 (11 7/8")	310 (12 3/16")
2"	254 (11 3/4")	267 (10 1/2")	286 (11 1/4")	171 (6 3/4")	479 (18 7/8")	450 (17 3/4")
3"	298 (11 3/4")	317 (12 1/2")	337 (13 1/4")	198 (7 3/4")	506 (19 15/16")	545 (21.46")
4"	352 (13 13/16")	368 (14 1/2")	394 (15 1/2")	218 (8 5/8")	525 (20 5/8")	712 (28")
6"	450 (17 3/4")	473 (18 5/8")	508 (20")	334 (13 1/8")	591 (23 1/4")	835 (32 7/8")



Series 85 pneumatic actuators

The Spirax Sarco Hiter 85 Series control valves are normally actuated by a Spirax Sarco Hiter DC spring and diaphragm actuator or Hiter PP piston actuator.

Series 85 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 85 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	85	85
Types	51, 52, 61, 62, 58, 68, 71	51
Valve size	½", 1", ¾" 1½", 2", 3", 4", 6", 8"	4"
Class	150, 300 and 600	150
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	316
Bonnet type	CE1 CE3 CE4	
Stem seal material	Braided PTFE Graphite	Graphite

Order example

85	51	4"	150#	WCB	316	CE1	Graphite
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