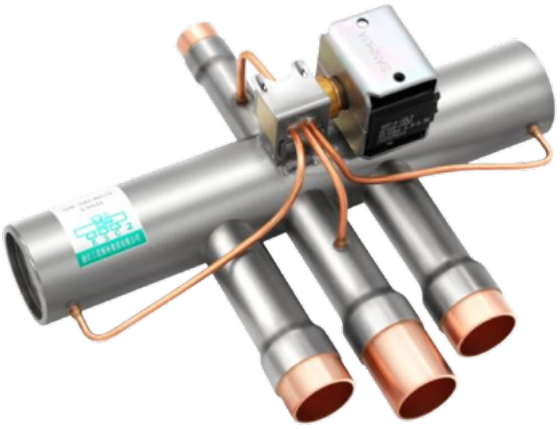
SHF-G *SERIES*

4 WAY REVERSING VALVE



SHF-G series four-way reversing valves are applicable for heat pump systems such as central, unitary air conditioners to realize switching between cooling mode and heating mode by changing the flow path of refrigerant. The main body in stainless steel guarantees an increased robustness with a design pressure suitable for all the refrigerant types and the certainly of a lead-free material. A Sanhua patent is related to the bi-metal joint of the four main connections: the pipes material is stainless steel, but the terminal of each connection is in pure copper to allow an easy brazing procedure.

FEATURES

- FULLY STAINLESS-STEEL VALVE BODY AND CONNECTION TUBE MAIN PART, HIGH PRESSURE STRENGTH, LOW WEIGHT AND BETTER ANTI-VIBRATION PERFORMANCE
- LOWER HEAT TRANSFER LOSS THAN BRASS VALVE, ENERGY EFFICIENT
- BRASS CONNECTOR FOR EASY WELDING
- SUITABLE FOR COOLING CAPACITIES FROM 4.2 TO 77.3 KW (R410A, CONDITION 2, ΔP: 0.1 BAR)

GENERAL SPECIFICATION

- Applicable for all common HCFC, HFC, HFO, HC refrigerants such as: R22, R134a, R404A, R407A/C/F, R410A, R507A, R448A, R449A, R450A, R452A, R513A, R32, R1234yf, R1234ze, R454A/B/C, R455A, R290, R1270, R600a, R744
- Ambient temperature range: from -30°C to +50°C
- Medium temperature TS min./max.: -30°C / +135°C
- Relative humidity: 0 to 95% RH
- Max. operating pressure - PS: 4.9 MPa (49 bar) for sizes 4, 7, 13; PS: 4.7 MPa (47 bar) for remaining sizes
- Installation position:
  - Coil upwards or with body axis in horizontal alignment
  - Flow direction according to installation instruction
- Certifications:
  - Declaration of conformity according to LVD and PED
  - Certification issued by Notify Body according to EN60730 and EN60335-2-24/40/89
  - UL/CSA certification (including A2L and A3 refrigerants)

4 WAY REVERSING VALVE

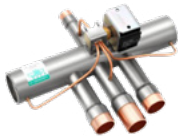


TABLE 1: MODELS SUITABLE FOR USAGE ON SYSTEM WITH VARIABLE SPEED (INVERTER)

General Characteristics											
Valve Model	Product Number	Type of System [Variable or Fixed Speed]	Ø Port	Kv	Connections ODF		MOP	OPD		PED Category	
					ØD	ØE/S/C		Max.	Min.	Fluid	Fluid
			[mm]	[m³/h]	[inch]	[inch]	[MPa]	[MPa]	[MPa]	Group 2	Group 1
SHF(G)-4H-23U-AE	10180963602	UNIVERSAL	8	1.54	1/4"	3/8	4.9	4	0.1	Art.4.3	Art.4.3
SHF(G)-7H-34U-AE	10180963502	UNIVERSAL	10.4	3.17	3/8	1/2	4.9	4	0.1	Art.4.3	Art.4.3
SHF(G)-13H-45-E	10180960302	UNIVERSAL	12.5	4.97	1/2	5/8	4.9	4	0.1	Art.4.3	Art.4.3
SHF-20D-46G36	10325083202	Variable	16.9	9.9	1/2	3/4	4.7	4	0.1	Art.4.3	Art.4.3
SHF-20D-47G36	10325091802	Variable	16.9	9.9	1/2	7/8	4.7	4	0.1	Art.4.3	Art.4.3
SHF-35B-67G48	10325098602	Variable	21	14.7	3/4	7/8	4.7	4	0.15	Art.4.3	Art.4.3
SHF-35B-79G48	10325088902	Variable	21	14.7	7/8	1 1/8	4.7	4	0.15	Art.4.3	Art.4.3
SHF-50-79G44	10325088302	Variable	23	18.3	7/8	1 1/8	4.7	4	0.15	Art.4.3	Art.4.3
SHF(L)-70-810G34	10325084902	Variable	28.6	28.5	1	1 1/4	4.7	4	0.15	Cat.II	Art.4.3
SHF(L)-70-910G34	10325089302	Variable	28.6	28.5	1 1/8	1 1/4	4.7	4	0.15	Cat.II	Art.4.3
SHF(L)-70-911G34	10325090902	Variable	28.6	28.5	1 1/8	1 3/8	4.7	4	0.15	Cat.II	Art.4.3

TABLE 2: MODELS OPTIMIZED FOR USAGE ON SYSTEM WITH FIXED SPEED (ON/OFF COMPRESSORS)

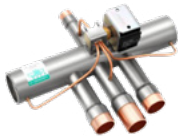
General Characteristics											
Valve Model	Product Number	Type of System [Variable or Fixed Speed]	Ø Port	Kv	Connections ODF		MOP	OPD		PED Category	
					ØD	ØE/S/C		Max.	Min.	Fluid	Fluid
			[mm]	[m³/h]	[inch]	[inch]	[MPa]	[MPa]	[MPa]	Group 2	Group 1
SHF-20D-46G35	10325084302	FIXED	16.9	9.9	1/2	3/4	4.7	4	0.1	Art.4.3	Art.4.3
SHF-20D-47G35	10325091702	FIXED	16.9	9.9	1/2	7/8	4.7	4	0.1	Art.4.3	Art.4.3
SHF-35B-67G49	10325098702	FIXED	21	14.7	3/4	7/8	4.7	4	0.15	Art.4.3	Art.4.3
SHF-35B-79G49	10325098402	FIXED	21	14.7	7/8	1 1/8	4.7	4	0.15	Art.4.3	Art.4.3
SHF-50-79G45	10325087302	FIXED	23	18.3	7/8	1 1/8	4.7	4	0.15	Art.4.3	Art.4.3
SHF(L)-70-810G35	10325084802	FIXED	28.6	28.5	1	1 1/4	4.7	4	0.15	Cat.II	Art.4.3
SHF(L)-70-910G35	10325092702	FIXED	28.6	28.5	1 1/8	1 1/4	4.7	4	0.15	Cat.II	Art.4.3
SHF(L)-70-911G35 x	10325100102	FIXED	28.6	28.5	1 1/8	1 3/8	4.7	4	0.15	Cat.II	Art.4.3

NOMINAL OPERATING CONDITIONS

Nominal Operating Conditions	Condition 1	Condition 2
Condensing Temperature t_c	38°C	54.4°C
Evaporating Temperature t_o	5°C	7.2°C
Superheat Δt_{sh}	5K	5K
Subcooling Δt_{sc}	0K	5K

Notes for Capacity Selection Tables: 1) Pressure drop is valid for flow from ØC to ØS or from ØE to ØS
2) R407C data based on dew point conditions

4 WAY REVERSING VALVE



CAPACITY TABLES AT CONDITION 1 [ΔP: 0.1 BAR]

Capacity Selection Table (1/4)								
Valve Model	Nominal Cooling Capacity [kW] (condition 1) - ΔP: 0.1 bar							
	R407C[2)]	R404A / R507	R134a	R410A	R290	R1270	R600a	R32
SHF 4G	3.2	2.9	2.7	4.2	4.2	4.6	2.6	5.4
SHF 7G	6.7	6.0	5.5	8.6	8.7	9.5	5.4	11.1
SHF 13G	10.5	9.4	8.6	13.5	13.6	14.9	8.5	17.3
SHF 20G	20.9	18.8	17.2	26.8	27.1	29.8	16.9	34.5
SHF 35G	31.0	27.9	25.5	39.8	40.2	44.2	25.1	51.2
SHF 50G	38.5	34.8	31.7	49.6	50.1	55.0	31.3	63.8
SHF 70G	60.0	54.2	49.4	77.3	78.0	85.7	48.8	99.4

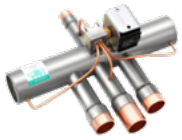
Capacity Selection Table (2/4)								
Valve Model	Nominal Cooling Capacity [kW] (condition 1) - ΔP: 0.1 bar							
	R1234yf	R1234ze	R454B	R454C	R455A	R452A	R448A	R449A
SHF 4G	2.3	2.2	4.5	2.9	3.0	2.8	3.3	3.2
SHF 7G	4.7	4.5	9.2	6.0	6.2	5.8	6.7	6.6
SHF 13G	7.4	7.1	14.4	9.3	9.6	9.1	10.5	10.4
SHF 20G	14.7	14.2	28.8	18.6	19.2	18.2	20.9	20.7
SHF 35G	21.9	21.1	42.7	27.7	28.5	27.0	31.1	30.8
SHF 50G	27.3	26.2	53.2	34.4	35.5	33.6	38.7	38.3
SHF 70G	42.4	40.9	82.9	53.6	55.3	52.4	60.2	59.7

CAPACITY TABLES AT CONDITION 1 [ΔP: 0.2 BAR]

Capacity Selection Table (3/4)								
Valve Model	Nominal Cooling Capacity [kW] (condition 1) - ΔP: 0.2 bar							
	R407C[2)]	R404A / R507	R134a	R410A	R290	R1270	R600a	R32
SHF 4G	4.6	4.1	3.8	5.9	6.0	6.5	3.7	7.6
SHF 7G	9.4	8.5	7.8	12.2	12.3	13.5	7.7	15.6
SHF 13G	14.8	13.4	12.2	19.1	19.2	21.1	12.0	24.5
SHF 20G	29.5	26.6	24.3	38.0	38.3	42.1	23.9	48.8
SHF 35G	43.8	39.5	36.0	56.4	56.9	62.5	35.6	72.5
SHF 50G	54.5	49.2	44.9	70.2	70.8	77.8	44.3	90.2
SHF 70G	84.9	76.6	69.9	109.3	110.3	121.2	68.9	140.5

Capacity Selection Table (4/4)								
Valve Model	Nominal Cooling Capacity [kW] (condition 1) - ΔP: 0.2 bar							
	R1234yf	R1234ze	R454B	R454C	R455A	R452A	R448A	R449A
SHF 4G	3.2	3.1	6.3	4.1	4.2	4.0	4.6	4.6
SHF 7G	6.7	6.4	13.0	8.4	8.7	8.2	9.5	9.4
SHF 13G	10.5	10.1	20.4	13.2	13.6	12.9	14.9	14.7
SHF 20G	20.9	20.1	40.7	26.3	27.2	25.7	29.6	29.3
SHF 35G	31.0	29.8	60.4	39.1	40.3	38.2	43.9	43.6
SHF 50G	38.5	37.1	75.2	48.7	50.2	47.6	54.7	54.2
SHF 70G	60.0	57.8	117.2	75.8	78.2	74.1	85.2	84.4

4 WAY REVERSING VALVE



CAPACITY TABLES AT CONDITION 2 [ΔP: 0.1 BAR]

Capacity Selection Table (1/4)								
Valve Model	Nominal Cooling Capacity [kW] (condition 2) - ΔP: 0.1 bar							
	R407C[2)]	R404A/R507	R134a	R410A	R290	R1270	R600a	R32
SHF 4G	3.0	2.6	2.5	3.8	3.9	4.3	2.5	5.0
SHF 7G	6.2	5.3	5.1	7.8	8.0	8.8	5.1	10.4
SHF 13G	9.7	8.3	8.0	12.2	12.5	13.8	8.0	16.3
SHF 20G	19.2	16.5	16.0	24.3	24.9	27.5	15.9	32.4
SHF 35G	28.6	24.5	23.7	36.1	36.9	40.8	23.7	48.1
SHF 50G	35.6	30.4	29.5	45.0	46.0	50.8	29.5	59.8
SHF 70G	55.4	47.4	45.9	70.0	71.6	79.1	45.9	93.2

Capacity Selection Table (2/4)								
Valve Model	Nominal Cooling Capacity [kW] (condition 2) - ΔP: 0.1 bar							
	R1234yf	R1234ze	R454B	R454C	R455A	R452A	R448A	R449A
SHF 4G	2.1	2.0	4.1	2.6	2.7	2.5	3.0	2.9
SHF 7G	4.3	4.2	8.5	5.4	5.6	5.1	6.1	6.1
SHF 13G	6.7	6.6	13.4	8.5	8.7	8.0	9.6	9.5
SHF 20G	13.3	13.1	26.6	16.9	17.4	16.0	19.1	18.9
SHF 35G	19.7	19.5	39.5	25.0	25.8	23.8	28.3	28.1
SHF 50G	24.5	24.3	49.2	31.2	32.1	29.6	35.2	34.9
SHF 70G	38.2	37.8	76.6	48.6	50.0	46.2	54.9	54.4

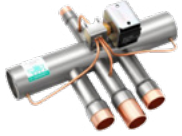
CAPACITY TABLES AT CONDITION 2 [ΔP: 0.2 BAR]

Capacity Selection Table (3/4)								
Valve Model	Nominal Cooling Capacity [kW] (condition 2) - ΔP: 0.2 bar							
	R407C[2)]	R404A/R507	R134a	R410A	R290	R1270	R600a	R32
SHF 4G	4.2	3.6	3.5	5.4	5.5	6.0	3.5	7.1
SHF 7G	8.7	7.5	7.2	11.0	11.3	12.4	7.2	14.7
SHF 13G	13.7	11.7	11.3	17.3	17.7	19.5	11.3	23.0
SHF 20G	27.2	23.3	22.6	34.4	35.2	38.9	22.6	45.8
SHF 35G	40.4	34.6	33.5	51.1	52.2	57.7	33.5	68.0
SHF 50G	50.3	43.1	41.7	63.6	65.0	71.9	41.7	84.6
SHF 70G	78.3	67.1	65.0	99.0	101.3	111.9	64.9	131.8

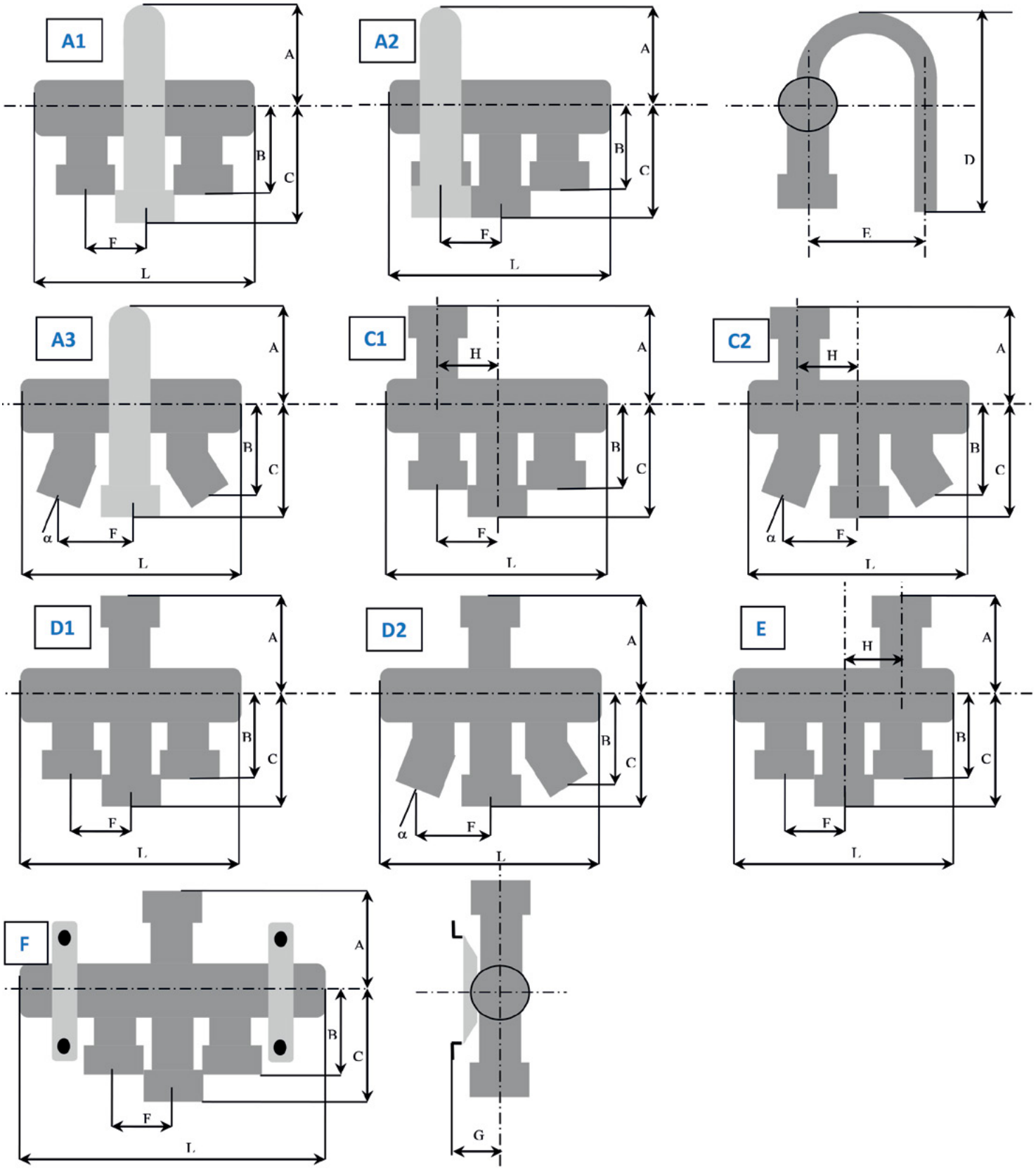
Capacity Selection Table (4/4)								
Valve Model	Nominal Cooling Capacity [kW] (condition 2) - ΔP: 0.2 bar							
	R1234yf	R1234ze	R454B	R454C	R455A	R452A	R448A	R449A
SHF 4G	2.9	2.9	5.9	3.7	3.8	3.5	4.2	4.2
SHF 7G	6.0	5.9	12.0	7.6	7.9	7.3	8.6	8.6
SHF 13G	9.4	9.3	18.9	12.0	12.3	11.4	13.5	13.4
SHF 20G	18.8	18.6	37.6	23.9	24.6	22.7	27.0	26.7
SHF 35G	27.9	27.6	55.9	35.4	36.5	33.7	40.0	39.7
SHF 50G	34.7	34.3	69.6	44.1	45.4	41.9	49.8	49.4
SHF 70G	54.1	53.4	108.3	68.7	70.7	65.3	77.6	77.0

Note: 1) The selection capacity of the four-way valve for R32 systems should be ≥60%. It is not recommended to use the fourway valve in systems with a capacity less than 60% of the nominal capacity. When used in R32 systems, it is essential to ensure the reliability of low-pressure commutation under extreme conditions.

4 WAY REVERSING VALVE



DIMENSIONS - VALVES



4 WAY REVERSING VALVE

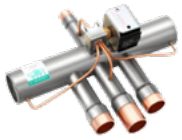


TABLE 3: DIMENSIONS AND WEIGHTS

Dimensions - Valves												
Valve Model	Valve Style	L	A	B	C	D	E	F	G	H	Angle α	Weight
		[mm]	[mm]	[mm]	[mm]	[mm]	[mm]	[mm]	[mm]	[mm]	[°]	[kg]
SHF(G)-4H-23U-AE	A1	92	43	50	62	105	43	12	-	-	-	0.15
SHF(G)-7H-34U-AE	A1	110.3	51	50	62	113	52	16	-	-	-	0.2
SHF(G)-13H-45-E	D1	131.5	52	50	62	-	-	20	-	-	-	0.24
SHF-20D-46Gxx	D1	184.6	67	81	93	-	-	28.6	-	-	-	0.52
SHF-20D-47Gxx	D1	184.6	67	81	93	-	-	28.6	-	-	-	0.52
SHF-35B-67Gxx	D1	208.6	78.2	82.3	95.3	-	-	33	-	-	-	0.84
SHF-35B-79Gxx	D1	208.6	78.2	84	97	-	-	33	-	-	-	0.84
SHF-50-79Gxx	D1	230.6	86.1	90.8	103.6	-	-	37	-	-	-	0.96
SHF(L)-70-810Gxx	D1	290	111	117	131	-	-	46	-	-	-	2.48
SHF(L)-70-910Gxx	D1	290	115	117	131	-	-	46	-	-	-	2.48
SHF(L)-70-911Gxx	D1	290	115	122	136	-	-	46	-	-	-	2.48

4 WAY REVERSING VALVE

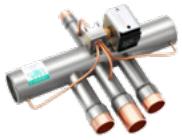


TABLE 4: ELECTRICAL COILS

Coil Characteristics												
Coil Model [1]	Winding Code	Part Number	Electrical Function/ Connection Type	Cable Length	Power Supply	Rated Voltage	Power Consumption AC 50Hz	Power Consumption AC 60Hz	Power Consumption DC	Protection Clas	Insulat. Class	Max. Op. Temp.
				[mm]	[-]	[V]	[W]	[W]	[W]	[-]	[-]	[°C]
SQ-A37024-000004	SHF-4-10L25	10805357502	Lead Wires	500	AC	24	4.5	3.5	-	IP54	F[2]	155
SQ-A37100-000001	SHF-4-10L21	10805357602	Lead Wires	500	AC	100	4.5	3.5	-			
SQ-A37115-000013	SHF-4-10L24	10805358302	Lead Wires	500	AC	115	4.5	3.5	-			
SQ-A37200-000001	SHF-4-10L22	10805357702	Lead Wires	500	AC	200	4.5	3.5	-			
SQ-A3720D-000001	SHF-4-10L34	10805357902	Lead Wires	500	AC	208-230	/	4.5	-			
SQ-A37220-000001	SHF-4-10L17	10805341402	Lead Wires	500	AC	220	6	5.0	-			
SQ-A3722G-000001	SHF-4-10L3	10805341302	Lead Wires	500	AC	220-240	4.5	3.5	-			
SQ-A3726H-000003	SHF-4-10L26	10805359202	Lead Wires	500	AC	265-277	4.5	3.5	-			
SQ-A3722G-000057	SHF-4-10L3	10805349102	Lead Wires	1500	AC	220-240	4.5	3.5	-			
SQ-A37115-000028	SHF-4-10L24	10805372902	Lead Wires	1500	AC	115	4.5	3.5	-			
SQ-A37024-000001	SHF-4-10L25	10805355602	Lead Wires	1550	AC	24	4.5	3.5	-			
SQ-A5022G-000001	SQ-A5022G	10805356002	Spade (Fast-on) [3]	-	AC	220-240	4.5	3.5	-	IP00	F	155
SQ-A5011A-000001	SQ-A5011A	10805355902	Spade (Fast-on) [3]	-	AC	110-120	4.5	3.5	-			
SQ-A50024-000001	SQ-A50024	10805355802	Spade (Fast-on) [3]	-	AC	24	4.5	3.5	-			
SQ-D44 012-00 00015)	SHF-4-10FA8	10805231802	Spade (Fast-on) [3]	-	DC	12	-	-	10			
SQ-D44 024-00 00015)	SHF-4-10FA9	10805070102	Spade (Fast-on) [3]	-	DC	24	-	-	11			
SQ-A27 100-00 0001	SQ-A27100	10805063202	Bi-stable/Lead W.	500	AC	100	18	18	-	IP54	B	130
SQ-A27 200-00 0001	SQ-A27200	10805063802	Bi-stable/Lead W.	500	AC	200	18	18	-			
SQ-A27 20K-00 0001	SQ-A2720K	10805222902	Bi-stable/Lead W.	500	AC	200-240	18	18	-			
SQ-D27 012-00 0001	SQ-D27012	10805069302	Bi-stable/Lead W.	500	DC	12	-	-	20			

Note: Max ambient temperature up to + 50°C

1) Every coil is applicable to all above specified valve models

2a) SQ-A37: insulation class according to UL is "B". Max Operating temperature: +130°C

2b) SQ-A37: insulation class according to VDE is "F". Max Operating temperature: +155°C

3) Wire Harness for coil with Fast-on connector available as accessory

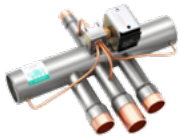
4) SQ-A27 coils can be used only with SHF valves from size 3 to size 100

5) SQ-D44 cannot be used in combination with SHF valves installed in systems operating with A2L and A3 refrigerants.

ACCESSORY

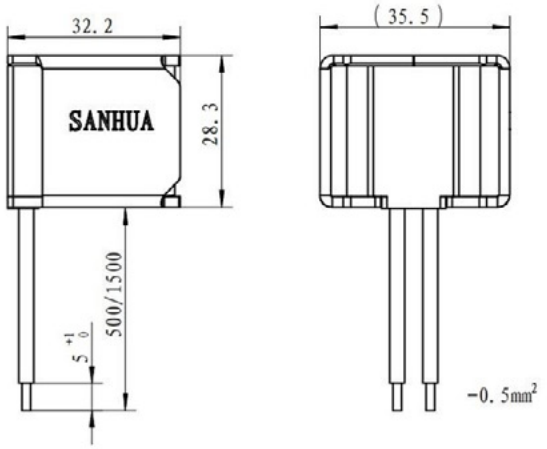
Wire Harness		
Model	Part Number	Cable Length [mm]
SQ-000000-090028	20805136301	1200
SQ-000000-090029	20805149201	2000

4 WAY REVERSING VALVE

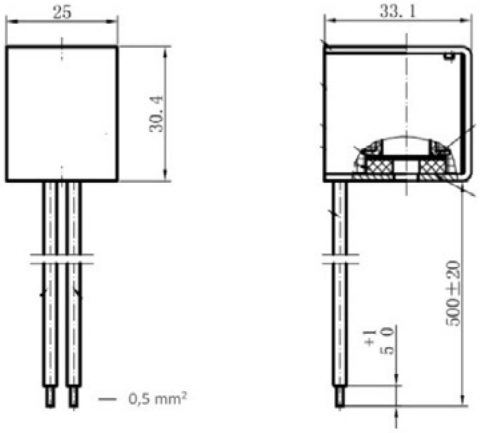


DIMENSIONS - COILS

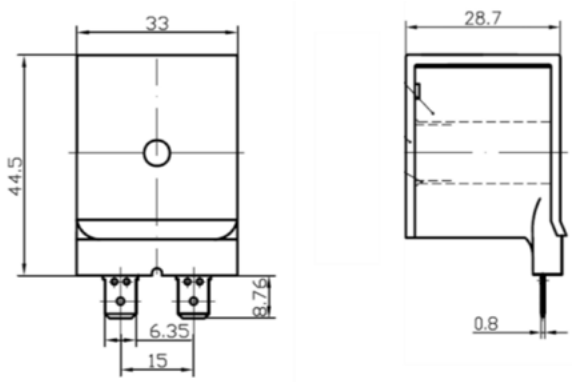
Coils with Lead Wires (SQ-A37 Series)



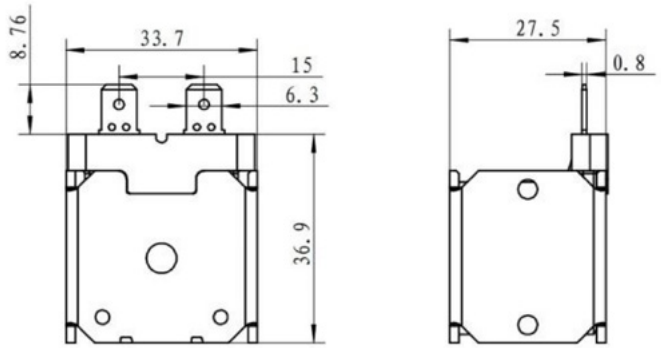
Bistable Coils (SQ-A/D27 Series)



Coils with Spade Connections (SQ-D44 Series)



Coils with Spade Connections (SQ-A50 Series)



Wire Harness (SQ-000000-0900xx)