aerospace
climate control
electromechanical
filtration
fluid & gas handling
hydraulics
pneumatics
process control
sealing & shielding

Electric Expansion Valves

SER-AA, -A

RACE Catalogue 100-20-1, April 2012

ENGINEERING YOUR SUCCESS.

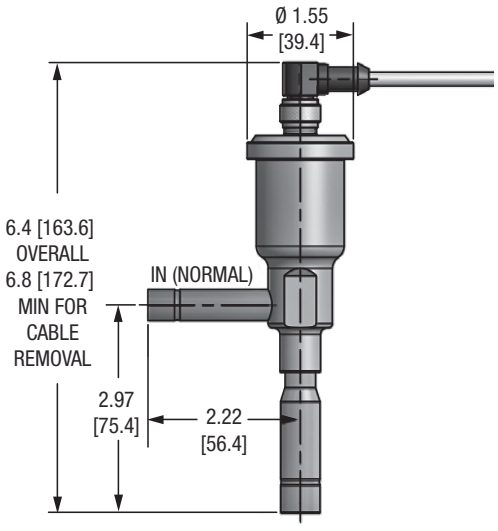
SER-AA, -A ELECTRIC EXPANSION VALVES

Features and Benefits

- 2nd Generation SER Electric Expansion Valves
- Bi-flow
- MOPD 40 bar in both dirctions
- MWP / PS: 70 barg
- Ideal for subcritical CO2 (R744) and small HFC and HCFC applications
- Low power consumption
- Solenoid tight seating
- High linear force output
- Corrosion resistant materials used throughout
- High resolution under lightest load conditions
- Metric connection available
- M12 removable cable connections (IP67)

SPECIFICATIONS	
Motor Type	2 phase, bipolar wet motor
Compatible refrigerant	All common HCFC and HFC refrigerants, including R-410A and subcritical R-744 (CO_2)
Compatible oil	All common mineral, polyester and alkybenzene oils
Supply voltage	12 volts DC, -5% +10% (L/R)
Cable type	IP67 removable M12 connection
Phase resistance	100 ohms ± 10%
Stepping Current	120 ma/winding (L/R)
Holding Current	Not recommended
Step rate	200/second (L/R), up to 400/second (properly configured current chopper)
Number of steps	2500 full steps
MOPD	580 psid (40 bar)
MWP (PS)	1015 psig (70 bar)
Max internal leakage	100 cc/min @ 100 psid (6.9 bar), dry air
Max external leakage	.10 oz/yr at 300 psig (2.8 gram/yr @ 20 bar)
Operating temp range (TS)	-50°F to 155°F (-45°C to 68°C)
Certification	Comply with PED 97/23/EC

REFERENCE DIMENSIONS



NOMENCLATURE

SER	-	AA A	3/8" 10mm	x	1/2" 12mm	ODF
Valve Family		Valve Model	Inlet Fitting		Outlet Fitting*	Fitting Type

Valve Ordering

Type	Connections	Body Configuration	Part Number
SER-AA	3/8" x 1/2" ODF	Angle - Less Cable	805221
	10mm x 12 mm ODF		805262
SER-A	3/8" x 1/2"	Angle - Less Cable	805237
	10mm x 12mm		805263

Cable Assembly Kit
for Electric Expansion Valves (With Stripped and Tinned Cable Ends)

Valve Type	Cable Length	Part Number
SER -AA,-A	3 meter	805194
	6 meter	805195

PSD4 Superheat Controller for SER-AA ,-A Electric Expansion Valves

Please note that full warranty and support will be provided only by using a Parker PSD4 driver or a driver which has been tested and approved by Parker Sporlan Division.

Order Selection Guide PSD4

	Vac. c.	Hz	A/I	D/I	D/O	SO	BS	PP	SP	CB	RS	DP
PSD4 Super Heat Controllers NO DISPLAY												
PSD4BX3	24	50/60	4	3	1-5A	1	✔	1	1	-	-	-
PSD4BM3	24	50/60	4	3	1-5A	1	✔	1	2	-	✔	-
PSD4BF3	24	50/61	4	3	1-5A	1	✔	1	3	✔	✔	-
PSD4 Super Heat Controllers DISPLAY												
PSD4DF3	24	50/60	4	3	1-5A	1	✔	1	3	✔	✔	✔

Key:
A/I = Analogue Input - **D/I** = Digital Output - **SO** = Stepper Output - **BS** = Battery Back Up - **PP** = Programming Port - **SP** = Serial Port - **CB** = CANBus - **IN** = INTRABUS - **RS** = Modibus RS-485 - **DP** = Display Fitted (LED)* LED.

For more information please refer to ''Race catalogue PSD4-2/UK''

Full Stroke Capacity in kW (at Evaporator Temperature °C)

R-134a Capacities in kW (at Evaporator Temperature °C)

R-134a

Valve Type	10°C								5°C								0°C							
	Pressure Drop Across Valve (bar)																							
	2.5	4	5.5	7	8.5	10	11.5	13	2.5	4	5.5	7	8.5	10	11.5	13	2.5	4	5.5	7	8.5	10	11.5	13
SER-AA	1.21	1.53	1.8	2.03	2.23	2.42	2.6	2.76	1.19	1.5	1.76	1.99	2.19	2.38	2.55	2.71	1.17	1.47	1.73	1.95	2.15	2.33	2.5	2.66
SER-A	2.63	3.33	3.9	4.4	4.85	5.26	5.64	6	2.58	3.26	3.83	4.32	4.76	5.16	5.53	5.88	2.53	3.2	3.75	4.23	4.66	5.06	5.43	5.77

Valve Type	-5°C								-10°C								-20°C							
	Pressure Drop Across Valve (bar)																							
	2.5	4	5.5	7	8.5	10	11.5	13	2.5	4	5.5	7	8.5	10	11.5	13	2.5	4	5.5	7	8.5	10	11.5	13
SER-AA	1.14	1.44	1.69	1.91	2.1	2.28	2.45	2.6	1.12	1.41	1.66	1.87	2.06	2.23	2.4	2.55	1.07	1.35	1.58	1.79	1.97	2.14	2.29	2.44
SER-A	2.48	3.14	3.68	4.15	4.57	4.96	5.32	5.65	2.43	3.07	3.6	4.06	4.47	4.85	5.2	5.53	2.32	2.93	3.44	3.88	4.28	4.64	4.98	5.29

R-404A Capacities in kW (at Evaporator Temperature °C)

R-404A

Valve Type	5°C								-5°C								-10°C							
	Pressure Drop Across Valve (bar)																							
	4	6	8	10	12	14	16	18	4	6	8	10	12	14	16	18	4	6	8	10	12	14	16	18
SER-AA	1.04	1.27	1.47	1.64	1.8	1.94	2.08	2.21	0.993	1.22	1.4	1.57	1.72	1.86	1.99	2.11	0.969	1.19	1.37	1.53	1.68	1.81	1.94	2.05
SER-A	2.26	2.76	3.19	3.57	3.91	4.22	4.51	4.79	2.16	2.64	3.05	3.41	3.74	4.03	4.31	4.57	2.1	2.58	2.97	3.33	3.64	3.93	4.21	4.46

Valve Type	-20°C								-30°C								-40°C							
	Pressure Drop Across Valve (bar)																							
	4	6	8	10	12	14	16	18	4	6	8	10	12	14	16	18	4	6	8	10	12	14	16	18
SER-AA	0.917	1.12	1.3	1.45	1.59	1.72	1.83	1.95	0.864	1.06	1.22	1.37	1.5	1.62	1.73	1.83	0.809	0.991	1.14	1.28	1.4	1.51	1.62	1.72
SER-A	1.99	2.44	2.82	3.15	3.45	3.73	3.98	4.23	1.88	2.3	2.65	2.97	3.25	3.51	3.75	3.98	1.76	2.15	2.48	2.78	3.04	3.29	3.51	3.73

R-407C Capacities in kW (at Evaporator Temperature °C)

R-407C

Valve Type	10°C								5°C								0°C							
	Pressure Drop Across Valve (bar)																							
	4	6	8	10	12	14	16	18	4	6	8	10	12	14	16	18	4	6	8	10	12	14	16	18
SER-AA	1.54	1.89	2.18	2.43	2.67	2.88	3.08	3.27	1.52	1.86	2.15	2.4	2.63	2.84	3.03	3.22	1.49	1.83	2.11	2.36	2.59	2.79	2.99	3.17
SER-A	3.34	4.09	4.73	5.28	5.79	6.25	6.68	7.09	3.29	4.03	4.66	5.21	5.71	6.16	6.59	6.99	3.24	3.97	4.59	5.13	5.62	6.07	6.49	6.88

Valve Type	-5°C								-10°C								-20°C							
	Pressure Drop Across Valve (bar)																							
	4	6	8	10	12	14	16	18	4	6	8	10	12	14	16	18	4	6	8	10	12	14	16	18
SER-AA	1.47	1.8	2.08	2.32	2.55	2.75	2.94	3.12	1.44	1.77	2.04	2.28	2.5	2.7	2.89	3.06	1.39	1.71	1.97	2.2	2.41	2.6	2.78	2.95
SER-A	3.19	3.91	4.51	5.05	5.53	5.97	6.38	6.77	3.14	3.84	4.44	4.96	5.43	5.87	6.27	6.65	3.02	3.7	4.28	4.78	5.24	5.66	6.05	6.41

Liquid Temperature Correction Factors

°C	-18	-12	-7	-1	4	10	16	21	27	32	38	43	49	54	60
R-134a	1.70	1.63	1.56	1.49	1.42	1.36	1.29	1.21	1.14	1.07	1.00	0.93	0.85	0.78	0.71
R-404A	2.04	1.94	1.84	1.74	1.64	1.54	1.43	1.33	1.22	1.11	1.00	0.89	0.77	0.65	0.53
R-407C	1.69	1.62	1.55	1.49	1.42	1.35	1.28	1.21	1.14	1.07	1.00	0.93	0.85	0.77	0.69

R-410A Capacities in kW (at Evaporator Temperature °C)

R-410A

Valve Type	10°C								5°C								0°C							
	Pressure Drop Across Valve (bar)																							
	5	8	11	14	17	20	23	26	5	8	11	14	17	20	23	26	5	8	11	14	17	20	23	26
SER-AA	1.69	2.14	2.51	2.83	3.12	3.39	3.63	3.86	1.68	2.12	2.49	2.81	3.1	3.36	3.6	3.83	1.66	2.11	2.47	2.79	3.07	3.33	3.57	3.8
SER-A	3.68	4.65	5.45	6.15	6.78	7.35	7.88	8.38	3.65	4.61	5.41	6.1	6.73	7.3	7.82	8.32	3.62	4.57	5.36	6.05	6.67	7.23	7.75	8.24

Valve Type	-5°C								-10°C								-20°C							
	Pressure Drop Across Valve (bar)																							
	5	8	11	14	17	20	23	26	5	8	11	14	17	20	23	26	5	8	11	14	17	20	23	26
SER-AA	1.65	2.08	2.44	2.76	3.04	3.3	3.53	3.76	1.63	2.06	2.42	2.73	3.01	3.26	3.5	3.72	1.59	2.01	2.36	2.66	2.93	3.18	3.41	3.62
SER-A	3.58	4.53	5.31	5.99	6.6	7.16	7.68	8.16	3.54	4.48	5.25	5.92	6.53	7.08	7.59	8.07	3.45	4.36	5.12	5.77	6.36	6.9	7.4	7.87

R-407A Capacities in kW (at Evaporator Temperature °C)

R-407A

Valve Type	5°C								-5°C								-10°C							
	Pressure Drop Across Valve (bar)																							
	4	6	8	10	12	14	16	18	4	6	8	10	12	14	16	18	4	6	8	10	12	14	16	18
SER-AA	1.39	1.71	1.97	2.21	2.42	2.61	2.79	2.96	1.35	1.65	1.91	2.13	2.34	2.52	2.7	2.86	1.32	1.62	1.87	2.09	2.29	2.48	2.65	2.81
SER-A	3.03	3.71	4.28	4.79	5.25	5.67	6.06	6.43	2.93	3.59	4.14	4.63	5.07	5.48	5.86	6.21	2.87	3.52	4.06	4.54	4.98	5.38	5.75	6.1

Valve Type	-20°C								-30°C								-40°C							
	Pressure Drop Across Valve (bar)																							
	4	6	8	10	12	14	16	18	4	6	8	10	12	14	16	18	4	6	8	10	12	14	16	18
SER-AA	1.27	1.56	1.8	2.01	2.2	2.38	2.54	2.7	1.22	1.49	1.72	1.93	2.11	2.28	2.44	2.58	1.16	1.42	1.64	1.84	2.01	2.17	2.32	2.46
SER-A	2.76	3.38	3.91	4.37	4.78	5.17	5.52	5.86	2.64	3.24	3.74	4.18	4.58	4.95	5.29	5.61	2.52	3.09	3.57	3.99	4.37	4.72	5.05	5.35

R-407F Capacities in kW (at Evaporator Temperature °C)

R-407F

Valve Type	5°C								-5°C								-10°C							
	Pressure Drop Across Valve (bar)																							
	4	6	8	10	12	14	16	18	4	6	8	10	12	14	16	18	4	6	8	10	12	14	16	18
SER-AA	1.53	1.88	2.17	2.42	2.65	2.86	3.06	3.25	1.49	1.82	2.1	2.35	2.58	2.78	2.98	3.16	1.46	1.79	2.07	2.32	2.54	2.74	2.93	3.11
SER-A	3.33	4.07	4.7	5.26	5.76	6.22	6.65	7.05	3.23	3.96	4.57	5.11	5.6	6.04	6.46	6.85	3.18	3.9	4.5	5.03	5.51	5.95	6.36	6.75

Valve Type	-20°C								-30°C								-40°C							
	Pressure Drop Across Valve (bar)																							
	4	6	8	10	12	14	16	18	4	6	8	10	12	14	16	18	4	6	8	10	12	14	16	18
SER-AA	1.42	1.73	2	2.24	2.45	2.65	2.83	3	1.36	1.67	1.93	2.16	2.36	2.55	2.73	2.89	1.31	1.6	1.85	2.07	2.27	2.45	2.62	2.78
SER-A	3.07	3.77	4.35	4.86	5.32	5.75	6.15	6.52	2.96	3.63	4.19	4.68	5.13	5.54	5.92	6.28	2.84	3.48	4.02	4.5	4.93	5.32	5.69	6.03

Liquid Temperature Correction Factors

°C	-18	-12	-7	-1	4	10	16	21	27	32	38	43	49	54	60
R-407A	1.76	1.68	1.61	1.53	1.46	1.39	1.31	1.24	1.16	1.08	1.00	0.92	0.83	0.74	0.64
R-407F	1.74	1.66	1.6	1.52	1.45	1.37	1.3	1.23	1.15	1.08	1	0.93	0.84	0.77	0.68
R-410A	1.61	1.55	1.49	1.43	1.39	1.31	1 .23	1.17	1.12	1.06	1.00	0.94	0.88	0.82	0.76

Capacity is calculated at full stroke, with no reserve capacity.
Valve should be selected with consideration given to entire range of potential system conditions.

R-744 Capacities in kW (at Evaporator Temperature °C)

R-744

Valve Type	10°C								5°C								0°C							
	Pressure Drop Across Valve (bar)																							
	5	8	11	14	17	20	23	26	5	8	11	14	17	20	23	26	5	8	11	14	17	20	23	26
SER-AA	2.49	3.15	3.69	4.16	4.59	4.97	5.33	-	2.53	3.21	3.76	4.24	4.67	5.07	5.44	5.78	2.57	3.25	3.81	4.3	4.74	5.14	5.51	5.86
SER-A	5.4	6.83	8.01	9.04	9.96	10.8	11.6	-	5.5	6.96	8.16	9.21	10.1	11	11.8	12.6	5.58	7.06	8.28	9.34	10.3	11.2	12	12.7

Valve Type	-5°C								-10°C								-20°C							
	Pressure Drop Across Valve (bar)																							
	5	8	11	14	17	20	23	26	5	8	11	14	17	20	23	26	5	8	11	14	17	20	23	26
SER-AA	2.6	3.28	3.85	4.34	4.79	5.19	5.57	5.92	2.61	3.31	3.88	4.37	4.82	5.23	5.61	5.96	2.63	3.33	3.9	4.41	4.85	5.27	5.65	6
SER-A	5.64	7.13	8.36	9.43	10.4	11.3	12.1	12.9	5.68	7.18	8.42	9.5	10.5	11.4	12.2	12.9	5.72	7.23	8.48	9.57	10.5	11.4	12.3	13

Valve Type	-30°C								-40°C							
	Pressure Drop Across Valve (bar)															
	5	8	11	14	17	20	23	26	5	8	11	14	17	20	23	26
SER-AA	2.63	3.33	3.9	4.4	4.85	5.26	5.64	6	2.62	3.31	3.88	4.38	4.82	5.23	5.61	5.97
SER-A	5.71	7.23	8.48	9.56	10.5	11.4	12.3	13	5.68	7.19	8.43	9.51	10.5	11.4	12.2	13

Liquid Temperature Correction Factors

°C	-18	-12	-7	-1	4	10	16	21	27	32	38	43	49	54	60
R-744	1.13	1.07	1	0.93	0.86	-	-	-	-	-	-	-	-	-	-

Parker Sporlan reserves the right to change this document without notice.

WARNING - USER RESPONSIBILITY

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- This document and other information from Parker-Hannifin Corporation, its subsidiaries and authorized distributors provide product or system options for further investigation by users having technical expertise.
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Aerospace

Key Markets

Aftermarket services
Commercial transports
Engines
General & business aviation
Helicopters
Launch vehicles
Military aircraft
Missiles
Power generation
Regional transports
Unmanned aerial vehicles

Key Products

Control systems & actuation products
Engine systems & components
Fluid conveyance systems & components
Fluid metering, delivery & atomization devices
Fuel systems & components
Fuel tank inerting systems
Hydraulic systems & components
Thermal management
Wheels & brakes

Climate Control

Key Markets

Agriculture
Air conditioning
Construction Machinery
Food & beverage
Industrial machinery
Life sciences
Oil & gas
Precision cooling
Process
Refrigeration
Transportation

Key Products

Accumulators
Advanced actuators
CO_2 controls
Electronic controllers
Filter driers
Hand shut-off valves
Heat exchangers
Hose & fittings
Pressure regulating valves
Refrigerant distributors
Safety relief valves
Smart pumps
Solenoid valves
Thermostatic expansion valves

Electromechanical

Key Markets

Aerospace
Factory automation
Life science & medical
Machine tools
Packaging machinery
Paper machinery
Plastics machinery & converting
Primary metals
Semiconductor & electronics
Textile
Wire & cable

Key Products

AC/DC drives & systems
Electric actuators, gantry robots & slides
Electrohydrostatic actuation systems
Electromechanical actuation systems
Human machine interface
Linear motors
Stepper motors, servo motors, drives & controls
Structural extrusions

Filtration

Key Markets

Aerospace
Food & beverage
Industrial plant & equipment
Life sciences
Marine
Mobile equipment
Oil & gas
Power generation & renewable energy
Process
Transportation
Water Purification

Key Products

Analytical gas generators
Compressed air filters & dryers
Engine air, coolant, fuel & oil filtration systems
Fluid condition monitoring systems
Hydraulic & lubrication filters
Hydrogen, nitrogen & zero air generators
Instrumentation filters
Membrane & fiber filters
Microfiltration
Sterile air filtration
Water desalination & purification filters & system

Fluid & Gas Handling

Key Markets

Aerial lift
Agriculture
Bulk chemical handling
Construction machinery
Food & beverage
Fuel & gas delivery
Industrial machinery
Life sciences
Marine
Mining
Mobile
Oil & gas
Renewable energy
Transportation

Key Products

Check valves
Connectors for low pressure fluid conveyance
Deep sea umbilicals
Diagnostic equipment
Hose couplings
Industrial hose
Mooring systems & power cables
PTFE hose & tubing
Quick couplings
Rubber & thermoplastic hose
Tube fittings & adapters
Tubing & plastic fittings

Hydraulics

Key Markets

Aerial lift
Agriculture
Alternative energy
Construction machinery
Forestry
Industrial machinery
Machine tools
Marine
Material handling
Mining
Oil & gas
Power generation
Refuse vehicles
Renewable energy
Truck hydraulics
Turf equipment

Key Products

Accumulators
Cartridge valves
Electrohydraulic actuators
Human machine interfaces
Hybrid drives
Hydraulic cylinders
Hydraulic motors & pumps
Hydraulic systems
Hydraulic valves & controls
Hydrostatic steering
Integrated hydraulic circuits
Power take-offs
Power units
Rotary actuators
Sensors

Pneumatics

Key Markets

Aerospace
Conveyor & material handling
Factory automation
Life science & medical
Machine tools
Packaging machinery
Transportation & automotive

Key Products

Air preparation
Brass fittings & valves
Manifolds
Pneumatic accessories
Pneumatic actuators & grippers
Pneumatic valves & controls
Quick disconnects
Rotary actuators
Rubber & thermoplastic hose & couplings
Structural extrusions
Thermoplastic tubing & fittings
Vacuum generators, cups & sensors

Process Control

Key Markets

Alternative fuels
Biopharmaceuticals
Chemical & refining
Food & beverage
Marine & shipbuilding
Medical & dental
Microelectronics
Nuclear Power
Offshore oil exploration
Oil & gas
Pharmaceuticals
Power generation
Pulp & paper
Steel
Water/wastewater

Key Products

Analytical Instruments
Analytical sample conditioning products & systems
Chemical injection fittings & valves
Fluoropolymer chemical delivery fittings, valves & pumps
High purity gas delivery fittings, valves, regulators & digital flow controllers
Industrial mass flow meters/ controllers
Permanent no-weld tube fittings
Precision industrial regulators & flow controllers
Process control double block & bleeds
Process control fittings, valves, regulators & manifold valves

Sealing & Shielding

Key Markets

Aerospace
Chemical processing
Consumer
Fluid power
General industrial
Information technology
Life sciences
Microelectronics
Military
Oil & gas
Power generation
Renewable energy
Telecommunications
Transportation

Key Products

Dynamic seals
Elastomeric o-rings
Electro-medical instrument design & assembly
EMI shielding
Extruded & precision-cut, fabricated elastomeric seals
High temperature metal seals
Homogeneous & inserted elastomeric shapes
Medical device fabrication & assembly
Metal & plastic retained composite seals
Shielded optical windows
Silicone tubing & extrusions
Thermal management
Vibration dampening

ENGINEERING YOUR SUCCESS.

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