



STEAM COMPRESSOR

MODEL SC CARBON STEEL (DUCTILE CAST IRON)

STEAM COMPRESSOR THAT RECOVERS LOW PRESSURE STEAM AT HIGHER PRESSURE FOR REUSE

Features

Maximizes steam utilization by recovering excess low pressure steam at a higher pressure resulting in reduced energy costs and CO₂ emissions.

1. Reuses energy from excess steam by increasing it to low/medium pressure.
2. No electricity required, so suitable for explosion-proof areas (with COS pressure control valve).
3. Condensate recovery tank unnecessary with optional condensate recovery package: condensate is first reduced to atmospheric pressure, then repressurized to mid-pressure steam for reuse.
4. Utilizes a proprietary high-efficiency steam compressor.
5. Pressure control valve has a built-in separator and steam trap, maintaining dry motive steam, thereby ensuring high long-term efficiency and stable discharge pressure.



Specifications

Model*	SC1-1	SC1-2	SC1-3	SC2-1	SC2-2	SC2-3	SC7-1	SC7-3
Pressure Control Valve	COS	CV-COS	CV10	COS	CV-COS	CV10	COS	CV10
Connection	Motive Inlet	DN 25 PN 25/40		DN 50 PN 25/40			DN 80 PN 25/40	
	Discharge Outlet	DN 80 PN 25/40		DN 100 PN 25/40			DN 150 PN 25/40	
	Suction Inlet	DN 80 PN 25/40					DN 100 PN 25/40	
Maximum Operating Pressure (barg) PMO	16		20	16	10	20	16	20
Motive Steam Pressure Range (barg)	6 - 16		6 - 20	6 - 16	6 - 10	6 - 20	6 - 16	6 - 20
Maximum Operating Temperature (°C) TMO	220							
Maximum Steam Suction Capacity	See "Model Selection and Performance Graphs" on third page							
Discharge Steam Pressure (Attainable Pressure)	Varies depending on relevant conditions such as Motive Steam Pressure/Volume, Steam Suction Pressure/Volume, etc. Contact TLV for assistance.							
Applicable Fluid	Saturated Steam							

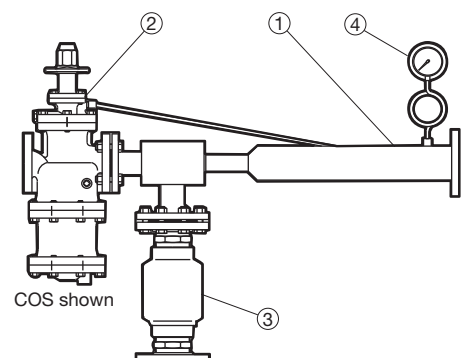
* Products exceeding specifications shown above may be able to be supplied depending on conditions. 1 bar = 0.1 MPa
PRESSURE SHELL DESIGN CONDITIONS (**NOT** OPERATING CONDITIONS): Maximum Allowable Pressure (barg) PMA: 16 (COS/CV-COS), 20 (CV10)
Maximum Allowable Temperature (°C) TMA: 220









To avoid abnormal operation, accidents or serious injury, DO NOT use this product outside of the specification range. Local regulations may restrict the use of this product to below the conditions quoted.

No.	Description	Material	DIN ¹⁾	ASTM/AISI ¹⁾
①	Ejector	Carbon Steel S25C	1.1158	AISI1025
②	Pressure Control Valve	COS	Ductile Cast Iron GGG40.3 ²⁾	0.7043 A395
		CV-COS	Ductile Cast Iron GGG40.3 ²⁾	0.7043 A395
		CV10	Cast Steel	— A216 WCC
③	Check Valve ^{3), 4)}	Cast Stainless Steel A351 Gr.CF8	1.4312	—
④	Pressure Gauge / Pressure Transmitter ⁵⁾	—	—	—

¹⁾ Equivalent materials ²⁾ Option: Cast Stainless Steel ³⁾ Check Valve for SC1/SC2 has screwed-in flange
⁴⁾ SC7 comes with connecting bolts, nuts, and gaskets. ⁵⁾ CV10 only



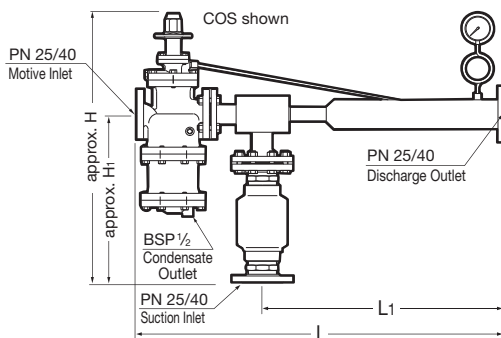
System Configuration

Steam Compressor Unit SC1/SC2/SC7		Examples of Connecting Equipment*
Pressure Control Valve	 <p>COS Self-actuating Control Valve</p> <ul style="list-style-type: none"> • Built-in separator and steam trap • No electric instrumentation required 	 <p>Non-electric Condensate Recovery Pump System Package</p> <ul style="list-style-type: none"> • Steam recovery at atmospheric pressure • Explosion-proof areas <hr/>  <p>Flash Tank</p> <ul style="list-style-type: none"> • Pressurized flash steam recovery <hr/>  <p>Condensate Recovery Pump</p> <ul style="list-style-type: none"> • High pressure condensate recovery
	 <p>CV-COS Pneumatic Control Valve</p> <ul style="list-style-type: none"> • Built-in separator and steam trap • High-precision control with no off-set 	
	 <p>CV10 Pneumatic Control Valve</p> <ul style="list-style-type: none"> • High-precision control with no off-set 	

*Actual available products may differ from those shown. Please consult TLV for details.

Dimensions

SC1-1

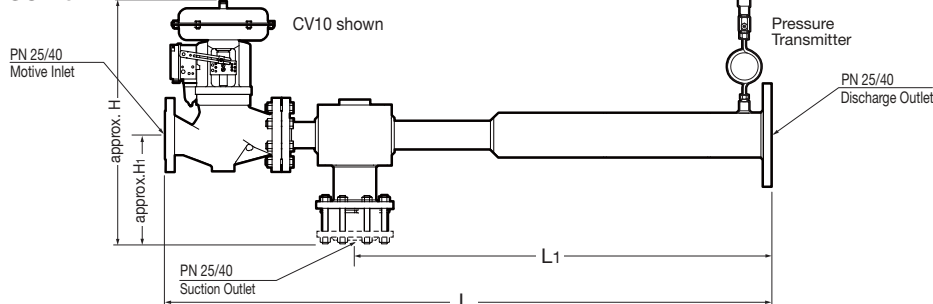


SC

Model	DN			L	L ₁	H	H ₁	Weight (kg)
	Motive Inlet	Suction Inlet	Discharge Outlet					
SC1-1	25	80	80	836	545	780	500	50
SC1-2						860		
SC1-3						785		
SC2-1	50	100	100	1121	734	850	530	100
SC2-2						920		
SC2-3						835		
SC7-1	80	150	100	1725	1140	710	300	155
SC7-3						670		

Screwed connections are BSP; other standards available

SC7-3

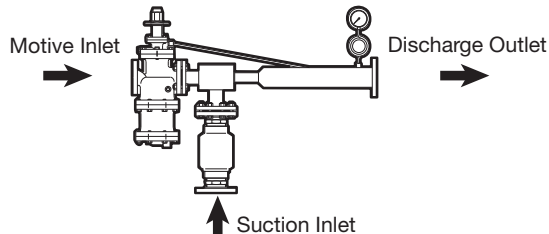


Model Selection and Performance Graphs

● Model Selection

Sample Selection Conditions

Motive Steam Pressure: 9 barg Suction Steam Pressure: 1 barg
 Discharge Steam Pressure: 3 barg Suction Steam Capacity: 300 kg/h



Using Model Selection Graph ① for 9 barg motive steam pressure, point A represents the sample suction steam pressure and capacity conditions for the desired discharge steam pressure (P_3) of 3 barg.

In the 3 barg discharge steam pressure range, point A falls slightly below the SC2 line, therefore Model SC2 or SC7 should be chosen.

For suction steam capacities greater than that of SC7, contact TLV.

● Capacity Check (Motive Steam Quantity and Discharge Steam Quantity)

At 9 barg motive steam pressure, according to Performance Graph ①, the entrainment ratio is approximately 3.9*. The motive steam quantity and discharge steam quantity can be calculated using the formulas A) and B) below.

*Entrainment Ratio = Motive Steam Quantity (kg/h) / Suction Steam Quantity (kg/h)

If motive steam pressure is between those given in Performance Graphs ① - ③, calculate using the higher and lower pressure graphs and estimate using the mean entrainment ratio.

Sample Calculation (For motive steam pressure of 10 barg)

At 9 barg motive steam pressure, according to Performance Graph ①, the entrainment ratio is approximately 3.9. At 12 barg motive steam pressure, according to Performance Graph ②, the entrainment ratio is approximately 2.8. The calculation in C) gives an approximate entrainment ratio of 3.5.

A) Motive steam quantity = Entrainment ratio × Suction steam quantity
 $= 3.9 \times 300 \text{ kg/h}$
 $= 1170 \text{ kg/h}$

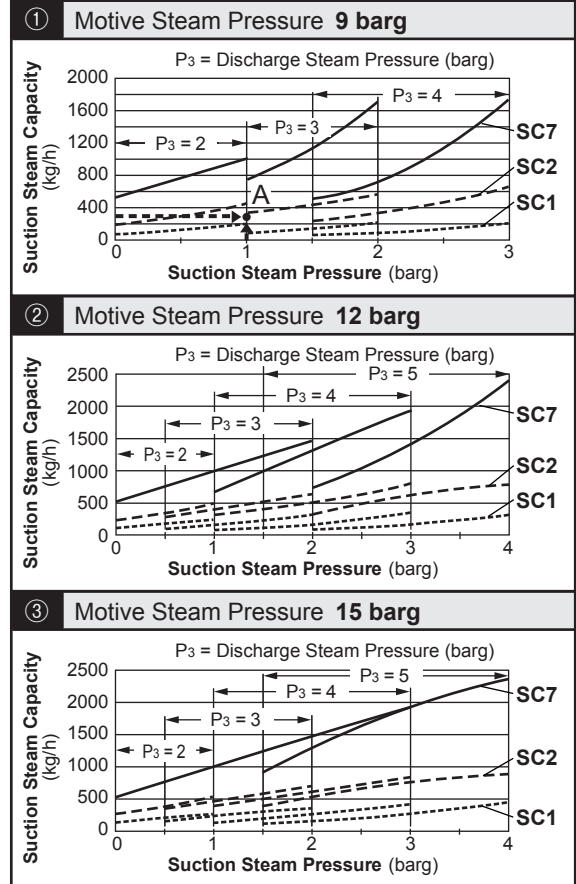
B) Discharge steam quantity = Motive steam quantity + Suction steam quantity
 $= 1170 \text{ kg/h} + 300 \text{ kg/h}$
 $= 1470 \text{ kg/h}$

C) Sample Calculation (For motive steam pressure of 10 barg)

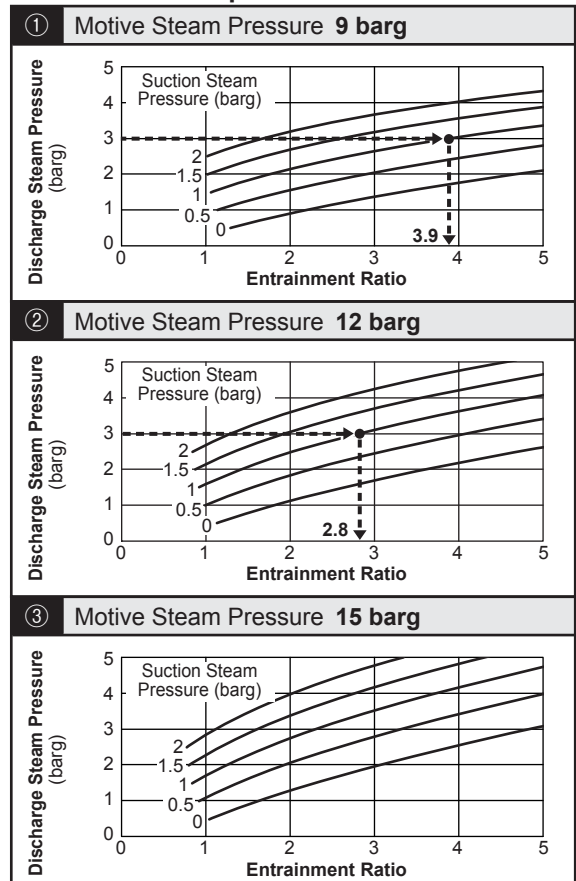
$$3.9 - \frac{(10 - 9 \text{ barg})}{(12 - 9 \text{ barg})} \times (3.9 - 2.8) = 3.5$$

NOTE: If using COS control valve (SC1-1, SC2-1, SC7-1), the Discharge Steam Pressure range is restricted to between 1 - 3 barg. The type-selection and capacity values from the above procedures are only approximations. Contact TLV for actual selection and performance data.

Model Selection Graphs



Performance Graphs



Memo:

Manufacturer

ISO 9001/ISO 14001

TLV® CO., LTD.
Kakogawa, Japan

is approved by LRQA Ltd. to ISO 9001/14001

