# **Steam and Water Analysis System** SWAS







In any Power plant running on steam, the purity of boiler feed water and steam is crucial; especially to steam turbines, steam boilers, superheaters, condensers, and other steam equipment. To prevent damage to the steam turbine, steam boiler, and other equipment due to scaling and corrosion, online steam and water analysis of critical parameters such as pH, Conductivity, Dissolved Oxygen, Silica, Sodium, Hydrazine, and Phosphate, etc is a must. Steam can be as hot as 560°C. Pressures can be as high as 250 bar. To keep the power plant up and running with minimum erosion and corrosion of the steam turbine, steam boiler, and condenser, we have developed a fully integrated Steam and Water Analysis System (SWAS) that provides exact, precise measurements of all these critical parameters. Samples are at high temperatures & pressure. Sample conditioning is required to bring down the temperature & pressure to the desired level.

# FOLLOWING MEASUREMENT ARE DONE WITH THE HELP OF SWAS

- » pH
- Conductivity
- » Dissolved Oxygen
- » Silica
- » Sodium
- » Hydrazine
- » Phosphate



AXIS has designed SWAS –Steam and Water Analysis System to keep you in power.

### SWAS PACKAGE HAS TWO TYPES OF PANELS.

#### 1. Wet Panel:

Sample coming from different points are fed to this panel. Contains sample conditioning components like a Thermal shut off valve (TSV), Cooler, Back pressure regulator(BPR), Pressure regulating valve(PRV), SOV, Temperature switch, Pressure & Temperature gauges, Rotameters, etc. The sensor is in the same panel, and the output of the sensor goes to the dry panel.

#### 2. Dry Panel:

It contains Analysers, Transcontrol matters, Annunciator, indicators, etc. All remote signals go from this panel to the control room.

# Single Line SWAS System

![](_page_2_Picture_1.jpeg)

SINGLE LINE SWAS WITH **COMPOSITE MANIFOLD** 

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**FEATURES** 

### **APPLICATIONS**

Power plant

- Economical »
- Self-Standing (Optional) »
- Ease of maintenance »
- Ease of Installation »
- Compact Design »
- Chemical Pharmaceutical »

Refinery

Food & Beverages »

## **ADVANTAGES**

- Add an analyzer or other analysis product »
- Create a complete sample system with analyzers and conditioning » on the same rack
- Use the back side of a freestanding floor rack to mount analysis » equipment
- Combine critical conditioning and analysis on a portable skid »
- Effective Temperature & Pressure reduction with constant flow » regulation to improve analyzer reliability
- Efficient cooler design suitable to all industry conditions »
- Sampling system with ASME PTC-19.11 STANDARD »
- Automatic High Temp. Shut-off valves are used for high-temperature » protection
- The composite manifold used in SWAS can reduce the size of the » rack

![](_page_2_Picture_22.jpeg)

SINGLE LINE SWAS WITHOUT **COMPOSITE MANIFOLD** 

## DESCRIPTION

Axis single-line SWAS systems are pre-tubed assemblies used to simplify the conditioning of steam, water, or non-hazardous process samples. With the addition of cooling water, safe and representative samples can be obtained from individual sampling sites that are remotely located throughout the plant or from a small number of samples in a central location.

There are two versions of Axis single-line SWAS systems — one for grab samples only and the other for both grab samples and to condition the sample for online analysis. These two versions are available for four types of the stream. 1) HPHT 2) HPLT 3) LPLT 4) LPHT. Axis single-line panels can be mounted on a variety of walls and come with full-width workable sinks and pre-piped cooling water headers to reduce installation time and cost.

Whether an individual single-line sample mounting plates solutions are completely engineered to meet the application requirement

#### ORDERING INFORMATION

SLSW				9					
Stream Type	Stream Type								
0	HPHT*								
1				HPLT*					
2			LPHT*						
3				LPLT*					
Indication Instrum	Indication Instruments & accessories								
0	Process Header								
1				Composite manifold					
Auto Shut-off \	Auto Shut-off Valve								
0				With alarm contact					
1				Without alarm contact					
2				Not required (low temp					
	stream)								
Temperatu	Temperature Indicator								
0	,			Dial Size: 63mm**					
1			Dial Size: 100mm						
Make o	of To	emp	erat	ature Indicator					
0	Baumer			Baumer					
		WIKA							
Pre	ssu	ire ii	ndic	ator					
0			Dial Size: 63mm**						
1			Dial Size: 100mm						
	Ma	ake of Pressure Indicator							
	0			Baumer					
	1			WIKA					
		Cat	tion	Column***					
		0		Yes					
		1		No					
			Мс	ounting					
		0		SS 304, wall mounting plate					
			1	SS 304, wall mounting					
				rack					

## ADITIONAL ACCESSORIES

Accessories	Model No.	Quantity		
Sample cooler	HBRIX	1 No.		
Strainer – STR14	ASPL2993	1 No.		
Strainer filter element : 40 Micron	ASPL3426	1 No.		
Direct acting pressure reducing valve	APRV1	1 No.		
KNOB	ASPL6955	1 No.		
Clamp for APRV1	ASPL5459	1 No.		
Back pressure regulator	BPR1	1 No.		
Sight flow indicator — SFI12	ASPL2385	1 No.		
PTFE Seating	ASPL3425	1 No.		
Glass window	ASPL3436	1 No.		
Auto shut off valve	ASV1	1 No.		
Clamp for ASV	ASPL5458	1 No.		
Composite manifold	CMF1	1 No.		
Normal Cation Column with Refill	CTN1-N	1 No.		
Long Cation Column with Refill	CTN1-L	1 No.		
Mounting Bracket	ASPL3408	1 No.		
Filter wire mesh ring	ASPL3409	1 No.		
Transparent body for CTN1-N	ASPL3412	1 No.		
Transparent body for CTN1-L	ASPL3411	1 No.		
Resin refill pack for CTN1-N	ASPL3415	1 No.		
Resin refill pack for CTN1-L	ASPL3414	1 No.		
"O" ring set	ASPL3410	1 Set		
Free standing rack				
Flow meter 0-25 LPH				
Flow meter 0-45 LPH				

**Note :** (\*) Please find Technical specifications of different streams in general Technical specifications table on page no. 4

- (\*\*) For composite manifold dial size must be 63 mm.
- ( \*\*\* ) Mounting plate size will be increased in the case of cation column

![](_page_4_Figure_0.jpeg)

#### SCHEMATIC OF SINGLE LINE SWAS SYSTEM

**HIGH/LOW PRESSURE HIGH TEMPERATURE SWAS SYSTEM** 

![](_page_4_Figure_3.jpeg)

**HIGH/LOW PRESSURE LOW TEMPERATURE SWAS SYSTEM** 

- 6. COOLING WATER OUTLET

#### TYPICAL TECHNICAL SPECIFICATIONS

OPTIONS	НРНТ	HPLT	LPLT	LPHT	
Sample Temperature	537 Dec °C (MAX)	50 Dec °C (MAX)	35 Dec °C (MAX)	200 Dec °C (MAX)	
Sample Pressure	393 bar g (MAX)	150 barg (MAX)	10 bar g (MAX)	30 barg (MAX)	
Sample Flow (Grab Sample)	25 LPH	25 LPH	25 LPH	25 LPH	
Sample Flow	50 LPH	50 LPH	50 LPH	50 LPH	
Strainer (Filter) Retention Rate	40 Micron	40 Micron	40 Micron	40 Micron	
Flow Meter	2.5-25 LPH	2.5-25 LPH	2.5-25 LPH	2.5-25 LPH	
Sample Cooler*	HBRIX MM	HBRIX MM	HBRIX MM	HBRIX MM	
Sample inlet connections	1/4" OD tube	1/4" OD tube	1/4" OD tube	1/4" OD tube	
Sample outlet connections	1/4" OD tube	1/4" OD tube	1/4" OD tube	1/4" OD tube	
Cooling water inlet connections**	3/4" NPT (F)	3/4" NPT (F)	3/4" NPT (F)	3/4" NPT (F)	
Cooling water outlet connections**	1/2" NPT (F)	1/2" NPT (F)	1/2" NPT (F)	1/2" NPT (F)	
Pressure Gauge Size	63 mm, 100 mm Press Range (0-7 Bar)	63 mm, 100 mm Press Range  (0-7 Bar)	63 mm, 100 mm Press Range  (0-7 Bar)	63 mm, 100 mm Press Range (0-7 Bar)	
Temperature Gauge Size	63 mm, 100 mm temp range (0-100 °C)	63 mm, 100 mm temp range (0-100 °C)	63 mm, 100 mm temp range (0-100 °C)	63 mm, 100 mm temp range (0-100 °C)	
APRV1	Min. 35 bar & Max. 350 bar	Min. 35 bar & Max. 350 bar	Min. 35 bar & Max. 350 bar	Min. 35 bar & Max. 350 bar	
BPR	1.4 Bar g	1.4 Bar g	1.4 Bar g	1.4 Bar g	
ASV set point	50°C ± 2°C	50°C ± 2°C	50°C ± 2°C	50°C ± 2°C	
Fittings	SS, double compression type	SS, double compression type	SS, double compression type	SS, double compression type	
Mounting Plate	SS-304	SS-304	SS-304	SS-304	

Note : (  $^{\ast}$  ) Please contact AXIS SOLUTIONS for cooler selection

(\*\*) Cooler connections will be changed as per the model, please check the Sample cooler data sheet for the connections details.

![](_page_5_Picture_1.jpeg)

GENERAL ARRANGEMENT DRAWINGS FOR SINGLE LINE SWAS WITH AND WITHOUT MANIFOLD

SINGLE LINE SWAS SYSTEM WITH MANIFOLD

![](_page_5_Picture_4.jpeg)

SINGLE LINE SWAS SYSTEM WITHOUT MANIFOLD

### **GA DRAWING**

SR.NO.		HPHT/QTY		HPLT/QTY		LPHT/QTY		LPLT/QTY	
	SLSW XXXXXXXXX	001111110 011000110		100111110 110000110		201111110 211000010		300111110 310000110	
1	Mounting Plate (MM)	W = 5 5 0 H= 800	W=450 H=800	W=500 H=700	W=350 H=700	W=550 H=800	W = 4 5 0 H=800	W=500 H=700	W=350 H=700
2	2 Way Ball Valve (BV2)	1	1	NA	NA	1	1	NA	NA
3	Sight Flow Indicator (SFI12)	1	1	NA	NA	1	1	NA	NA
4	Sample Cooler (HE)	1	1	NA	NA	1	1	NA	NA
5	3 Way Ball Valve (BV3)	1	1	NA	NA	1	1	NA	NA
6	Isolation Valve (IV)	2	2	2	2	2	2	2	2
7	Direct Acting Pressure Reducing Valve (APRV1)	1	1	1	1	NA	NA	NA	NA
8	Needle Valve (NV)	NA	NA	NA	NA	1	1	1	1
9	Composite Manifold (CMF1)	NA		NA	- 1	NA	- 1	1	- 1
10	Strainer (STR14)	1	4	1		1		NA	
11	Temperature Indicator (TI)	1	I	1		1		1	
12	Pressure Indicator (PI)	1		1		1		1	
13	Auto Shut-Off Valve (ASV1)	1	1	NA	NA	1	1	1	NA
14	Flow Indicator (FIN)	1	1	1	1	1	1	1	1
15	Back Pressure Regulator (BPR1)	1	1	1	1	1	1	1	1
16	Grab Sample	1	1	1	1	1	1	1	1
17	Double Compression Type Fitting	AR	AR	AR	AR	AR	AR	AR	AR
18	SS 304 Tubing	AR	AR	AR	AR	AR	AR	AR	AR