



3D TRASAR™ Boiler Technology Detects, Determines and Delivers the Next Dimension of Boiler Water Management

Nalco's 3D TRASAR Technology helps you meet your goals for water, energy and total cost management for your boiler systems. 3D TRASAR automation and control is now available for all of your boiler water treatment needs for systems operating from low to high pressures and for systems using zeolite softened to high purity boiler feedwater make-up supplies. This premier water treatment control system builds on the Nalco 3D TRASAR platform which has over 30,000+ applications globally. 3D TRASAR boiler programs use proprietary control algorithms and Nalco's patented TRASAR fluorescence technology incorporated into our advanced boiler water treatment chemistries for boiler scale and pre-boiler corrosion control to detect system variation, determine necessary corrective actions, and deliver the optimal results and measureable value.

Nalco continues to expand the 3D TRASAR technology platform to address the varied needs of our customers making it the industry standard for monitoring and control delivering measurable results and a peace of mind that your system is properly protected. The Nalco Corrosion Stress Monitor (NCSM) minimizes pre-boiler corrosion by measuring and reacting to the net oxidation/reduction potential of the water stream at the system's operating temperature conditions providing a measurement of the relative corrosivity of the water in the process stream. The NCSM detects changes in corrosion stresses, determines the corrective action and responds in real-time by changing oxygen scavenger/metal passivator feed to protect the system and minimize metal loss. The Nalco Hardness Response Program incorporates a state of the art hardness analyzer that monitors the process stream; feedwater, condensate, make-up water, for increases in hardness concentrations; calcium and magnesium. Based on the measured results, the 3D TRASAR

system can make treatment program adjustments to provide optimal scale control protection within the boiler system. The 3D TRASAR for High Pressure boiler systems provides "in the box" automated boiler water pH/phosphate control for boiler systems operating at high pressures or with high purity boiler feedwater supplies that utilize a phosphate treatment strategy for boiler water corrosion control.

3D TRASAR boiler technology can also help save energy by maximizing the boiler water cycles of concentration through automated boiler blowdown control to keep the boiler water conductivity levels within the desired control range. The controller can be set up for either intermittent or continuous boiler water sampling. A variety of control options provide the flexibility to optimize system operation. The controller, equipped with the optional relay box, can operate up to four blowdown control valves. For boiler systems that have high purity makeup water where feedwater conductivity levels are too low for accurate measurement, you can use a second 3D TRASAR System or hand held instrument to measure the TRASAR concentration in the cycled up boiler water and use this value to determine and control the necessary blowdown rate preventing other solids, such as silica, from cycling up to unacceptable levels.

The 3D TRASAR Boiler System can also be used to monitor condensate systems. Conductivity and pH are continuously monitored and if the condensate does not meet the user-specified conditions a satellite feed treatment program can be applied to bring the condensate back in spec or a relay can be activated to sewer the contaminated condensate and/or trigger an alarm to help prevent it from contaminating the boiler feedwater system.

3D TRASAR boiler technology is just one more example of how Nalco innovation protects your boiler systems, saves water and energy, increases efficiency and provides our customer operational peace of mind that their boiler systems are being properly cared for 24/7/365.



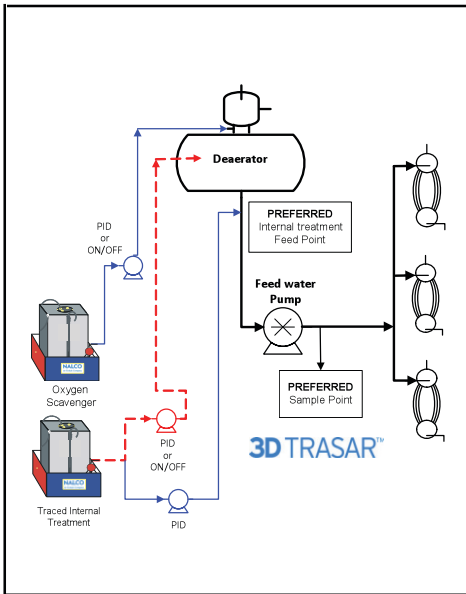
Table 1 - 3D TRASAR boiler technology can be customized and upgraded to ensure your system has the amount of desired control when and where you want it.

3D TRASAR Boiler Technology								
Feature Description	Model BL50XX	Model BL53XX	Model BL54XX	Model BL55XX	Model BL56XX	Model BL57XX	Model BL61XX	Model BL68XX
3D TRASAR Controller & Configurator Software	S	S	S	S	S	S	S	S
Communication for Remote Monitoring and Alarming	S	S	S	S	S	S	S	S
Web Reporting & Data Management	S	S	S	S	S	S	S	S
3D TRASAR Fluorometer for Internal Treatment Control		U	S3	S3	S1	S1	S3	S1
Corrosion Stress Monitor (NCSM) for Preboiler Corrosion Control	U	S	U*	S	U*	S		
Maximum pressure 100 psi (3.4 bar)	S							
Maximum pressure 1500 psi (103 bar)			S	S			S	
Maximum pressure 2000 psi (138 bar)					S	S		S
Maximum pressure 2800 psi (193 bar)		S						
Conductivity-Based Blowdown Control		U**	U**	U**	U**	U**		
TRASAR-Based Blowdown Control			U	U	U	U	S3	S1
pH & Conductivity Monitoring	S	U	S	S	S	S		S
<i>S = Standard feature S1 = Standard (TRASAR #1) S3 = Standard (TRASAR #3) U = Upgrade available</i> <i>* Up to 2 total ** Up to 4 boilers</i>								

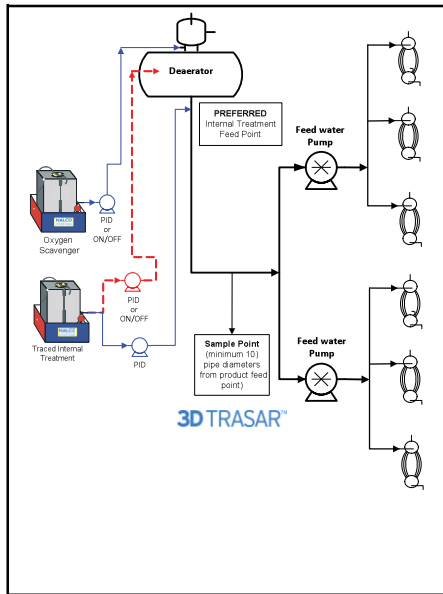
Specifications

The 3D TRASAR boiler technology systems consist of a number of modules. The modules are factory-assembled on a free-standing frame that can also be mounted on a wall. This modular design provides a broad range of monitoring and control capabilities.

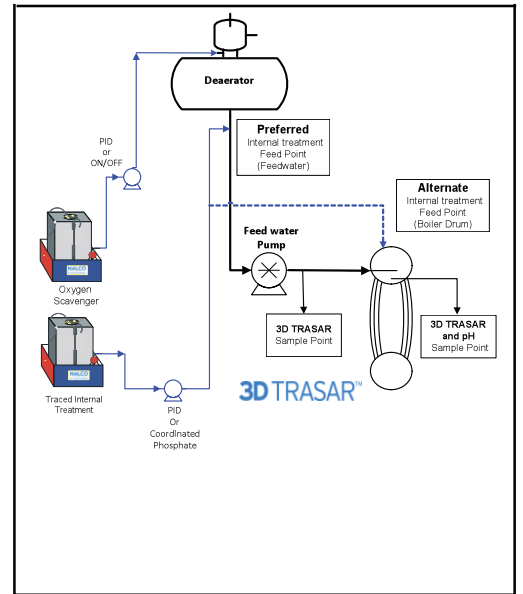
Sample Limits for 3D TRASAR System Modules						
	Feedwater	Sample Conditioning Systems				
		Feedwater			Blowdown	
	NCSM	Very High Pressure	High Pressure	Low Pressure	Very High Pressure	High Pressure
Sample Description	Feedwater	Feedwater	Feedwater	Feedwater	Blowdown	Blowdown
Maximum Sample Pressure	2800 psi (193 bar)	2000 psi (138 bar)	1500 psi (103 bar)	50 psi (3.4 bar)	2000 psi (138 bar)	1500 psi (103 bar)
Minimum Sample Pressure	20 psi (1.4 bar)	50 psi (3.4 bar)	50 psi (3.4 bar)	10 psi (0.7 bar)	50 psi (3.4 bar)	50 psi (3.4 bar)
Maximum Sample Temperature	500°F (260°C)	600°F (315°C)	500°F (260°C)	500°F (260°C)	600°F (315°C)	500°F (260°C)
Maximum Sample Flow	500 cc/min	1500 cc/min	1500 cc/min	1500 cc/min	1000 cc/min	1000 cc/min
Minimum Sample Flow	250 cc/min	250 cc/min	250 cc/min	250 cc/min	250 cc/min	250 cc/min
Notes: 1) The module's sample temperature, pressure and flow limits are defined by the lowest limit of any module included in the system. 2) Maximum sample flow though a Sample Conditioning System may be limited due to cooling water availability.						



(preferred installation)



Low pressure sample point



Proportional phosphate sample points

Feed and Control Methods

Chemical Feed - Scale/Corrosion Inhibitor

- On/Off for PID based on TRASAR signal
- Proportional phosphate based on TRASAR signal and pH
- On/Off based on hardness levels
- Slaved to steam flow
- Timer
- Manual

Chemical Feed - Scavenger/Passivator

- On/Off for PID based on NCSM signal
- On/Off for PID based on TRASAR signal
- Slaved to steam flow or TRASAR signal
- Timer
- Manual

Chemical Feed - Amines

- Slaved to steam flow
- Slaved to scale or corrosion inhibitor
- Timer
- Manual

Blowdown Control

- Based on conductivity or TRASAR measurements
- Continuous or intermittent sampling
- ON/OFF, PID or Time-based proportional control
- Trap sample capability
- High/low demand sampling schedules

Monitoring Functions

Monitored Feedwater Variables

- TRASAR Concentration
- pH
- Conductivity
- Cell Fouling
- Turbidity
- Temperature
- Output Status
- Pulse counter with water meter

Additional Calculated Variables

- Pump Duty
- Product Usage

Condensate Monitor

- pH
- Conductivity
- Temperature
- Corrosivity (Nalco Corrosion Monitor)

NCSM Module:

Maximum Sample Pressure: 2800 psi (193 bar)

Maximum Sample Temperature: 500°F (260°C)

Sample Flow: 250-500 cc/min

Inlet/Outlet Connection: 1/4" SS tubing

Wetted Materials: 316 SS, Teflon, Zirconia, Platinum, PEEK

Sensor Protection:

Indoor Model: Lexan shield

Enclosed Model: Vented SS enclosure

Mounting Holes: 7/16" diameter

Cable with signal booster:

Ambient Conditions: 40°F (4°C) to 140°F (60°C)

Note: Allow at least 8-10 inches below the NCSM sensor for servicing the reference electrode.

Fluorometers:**TRASAR Chemistry Measured: TRASAR #3**

Lower Detection Limit: 0.05 ppb as TRASAR #3
(0.2 ppm if Product Factor is 40)

Upper Measurement Limit: 150 ppb as TRASAR #3
(600 ppm if Product Factor is 40)

Sample Temperature Limit: 40-120°F (4-50°C)

TRASAR Chemistry Measured: TRASAR #1

Lower Measurement Limit: 3 ppb as TRASAR #1
(0.7 ppm if Product Factor is 90.9)

Upper Measurement Limit: 10 ppm as TRASAR #1
(2400 ppm if Product Factor is 90.9)

Sample Temperature Limit: 40-120°F (4-50°C)

pH Probe (Feedwater and Condensate):

Maximum Pressure: 50 psi (3.4 bar)

Maximum Temperature: 167°F (75°C)

Electrode Mounting: 1" (install in 1" FNPT cross w/1" tube to NPT adapter)

Electrode Cable: 2-wire, 4-ft (1.2 m)

Applications: Samples with 5-500 µS conductivity

Conductivity Probe (Blowdown):

Maximum Pressure: 250 psi (17.2 bar)

Maximum Temperature: 392°F (200°C)

Electrode Mounting: 3/4" MNPT, install in 3/4" NPTF cross

Electrode Cable: 4-conductor, shielded, 22 AWG min.

Electrode Leads: Teflon coated, 8" (0.2 m)

Temperature Compensation: Optional

Range: 100-10,000 µS/cm

Conductivity Probe (Feedwater & Condensate)

Max. Pressure: 200 psi (13.8 bar)

Max. Temperature: 158°F (70°C)

Electrode Mounting: 3/4" MNPT, install in 3/4" FNPT tee

Electrode Cable: 4-conductor, shielded, 22 AWG min.

Electrode Leads: PVC coated, 48" (1.2 m)

Range: 5-500 µS/cm

Blowdown Relay Box:

Electrical Power: 115 VAC, 60 Hz, 10 Amps (separate line required)

Power Cable: 15 ft (no receptacle plug)

Enclosure: Nema 4X

Number of Relays: 4

Relay Type: SPDT (single pole double throw), 115 VAC, 60 Hz

Condensate Monitor System:

Maximum Pressure: 50 psi (3.4 bar)

Minimum Temperature: 200°F (93°C) only if model with optional NCM is ordered

Maximum Temperature: 250°F (122°C)

Sample Flow: 250-1000 ml/min

Sample Inlet Connection: 1/4" SS tubing

Sample Outlet Connection: 1/2" FNPT

Cooling Water Connections: 1/2" FNPT

Wetted Materials: 316 SS, PTFE, Viton® synthetic rubber

Note: Sample must be cooled to below 158°F (70°C) downstream of the sample cooler (included).

Analog Input Module:

Electrical Power: 115 VAC, 60 Hz, 5 Amps (separate line required)

Power Cable: 6 ft (no receptacle plug)

Connection to controller: RS-485 (cable not supplied)

Number of Inputs: 8

Input Type: 4-20 mA, non-isolated (powered or unpowered)

Resolution: 16 bits

24 VDC Power Source: +24 VDC @ 500 mA
(maximum draw) regulated power source

Enclosure: Nema 4X

Sample Conditioning System:**Very High Pressure Feedwater System**

Maximum Sample Pressure: 2000 psi (138 bar)

Minimum Sample Pressure: 50 psi (3.4 bar)

Maximum Sample Temperature: 600°F (315°C)

Sample Flow: 250-1500 ml/min

High Pressure Feedwater System

Maximum Sample Pressure: 1500 psi (103 bar)

Minimum Sample Pressure: 50 psi (3.4 bar)

Maximum Sample Temperature: 500°F (260°C)

Sample Flow: 250-1500 cc/min

Low Pressure Feedwater System

Maximum Sample Pressure: 50 psi (3.4 bar)

Minimum Sample Pressure: 10 psi (0.7 bar)

Maximum Sample Temperature: 250°F (122°C)

Sample Flow: 250-1500 cc/min

Very High Pressure Blowdown System

Maximum Sample Pressure: 2000 psi (138 bar)

Minimum Sample Pressure: 50 psi (3.4 bar)

Maximum Sample Temperature: 600°F (315°C)

Sample Flow: 250-1000 ml/min

High Pressure Blowdown System

Maximum Sample Pressure: 1500 psi (103 bar)

Minimum Sample Pressure: 50 psi (3.4 bar)

Maximum Sample Temperature: 500°F (260°C)

Sample Flow: 250-1000 cc/min

Cooling-Depressurizing System

Maximum Pressure: 2800 psi (193 bar)

Maximum Temperature: 500°F (260°C)

Sample Flow: 250-500 cc/min

Note: Use only for cooling and depressurizing the sample before discharging it directly to a suitable drain. **DONOT** install upstream of instrumentation.

All Sample Conditioning Systems

Inlet Connection: 1/4" SS tubing

Outlet Connection: 1/4" MNPT

Wetted Materials: 316 SS, PTFE, Acrylic, PVC, Polyethylene, Nylon, Polypropylene, Viton synthetic rubber

3D TRASAR Controller

Electrical

90 to 240 VAC, 50/60 Hz, 15/8 Amps

Inputs

- (4) Analog inputs, non-isolated, 4-20mA or 0-10V (user-selectable), powered or non-powered
- (1) Interlock input (contact closure)
- (4) Digital inputs (contact closure or transistor) discrete or low frequency water meter counts
- (2) pH/NCSM user selectable, individually isolated
- (6) Contacting conductivity inputs (2 or 4 wire)
- (3) Temperature (RTD, PT1000) inputs (4 wire)
- (2) Fluorometer inputs (Modbus)
- Modbus RS-232 or RS-485 (choose one) RTU SCADA port

Outputs

- (5) control relay outputs rated 2/1 amp each (larger loads require external motor starters)
- (8) 4-20mA outputs, powered, non-isolated, 600 ohms

Alarms

- (1) Alarm output relay (rated 1.0 amp max)

Enclosure

Nema 4X

Ambient temperature

40-120°F (4-50°C)

Relative Humidity

0-95% non-condensing

Display/Keypad

Numeric keypad plus specialty keys

Security

Password protected (user assignable)

Communications

- (2) Ethernet port for direct PC connection, network or wireless gateway
- USB memory stick (approved devices only)
- Wireless gateway with access to Nalco website.

Approvals

CE, UL (NEMA 4x-Indoor)

Software

- 3D TRASAR Configurator for system configuration and data transfer
- Optional Vantage™ 100 SPC software for comprehensive data management and analysis.

System Dimensions

Universal Frame System:

Dimensions: 29" D x 33" W x 66" H (74 cm x 84 cm x 168 cm)

Material: PVC back panel on SS frame

Note: All models now have a universal frame with removable feet for wall mounting.

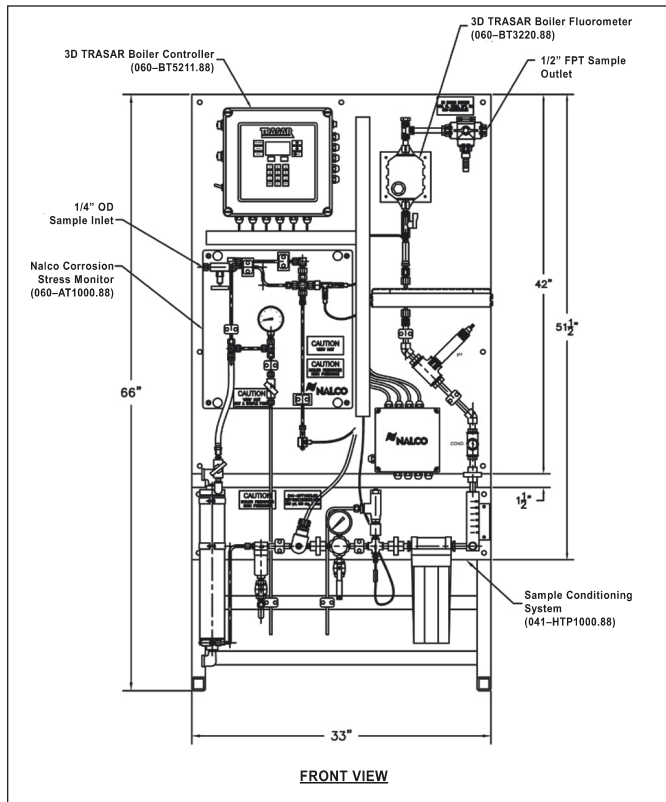
Support

Please contact your local Nalco Sales Engineer if you have any questions. In North America, you can also contact the Nalco Equipment Solutions Technical Support Group at 1-800-323-8483.

3D TRASAR System Diagrams

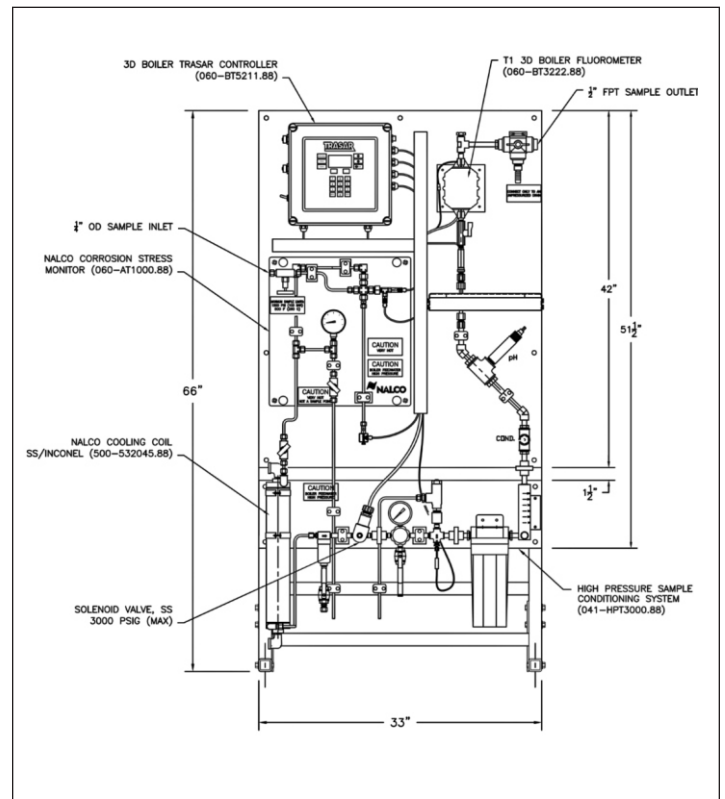
The following diagrams are representative of the systems in each model series. They have been selected to illustrate the broad variety of possible configurations. The actual equipment included in each system is dependent on the specific model number.

060-BLx55xxxx.88 Series



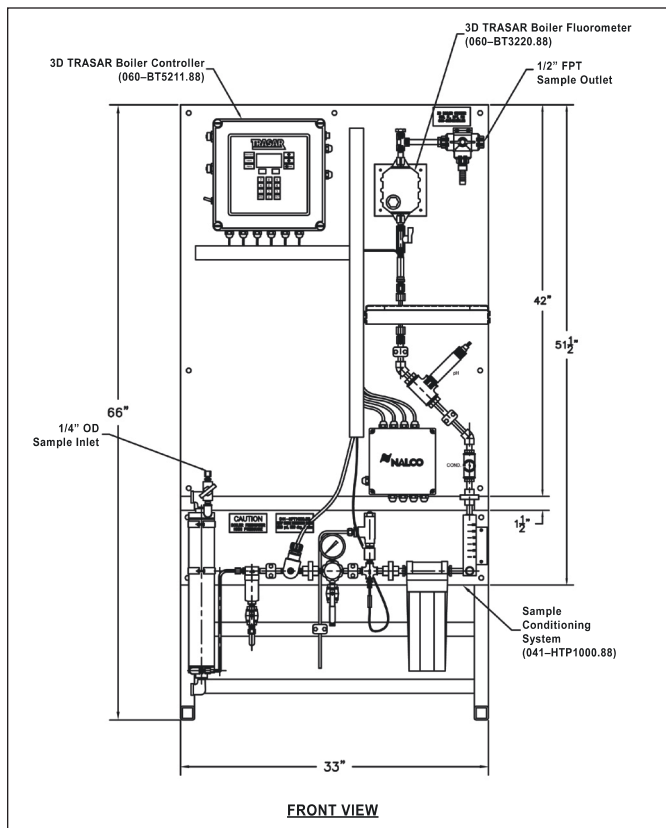
Part Number 060-BL5521BH.88

060-BLx57xxxx.88 Series



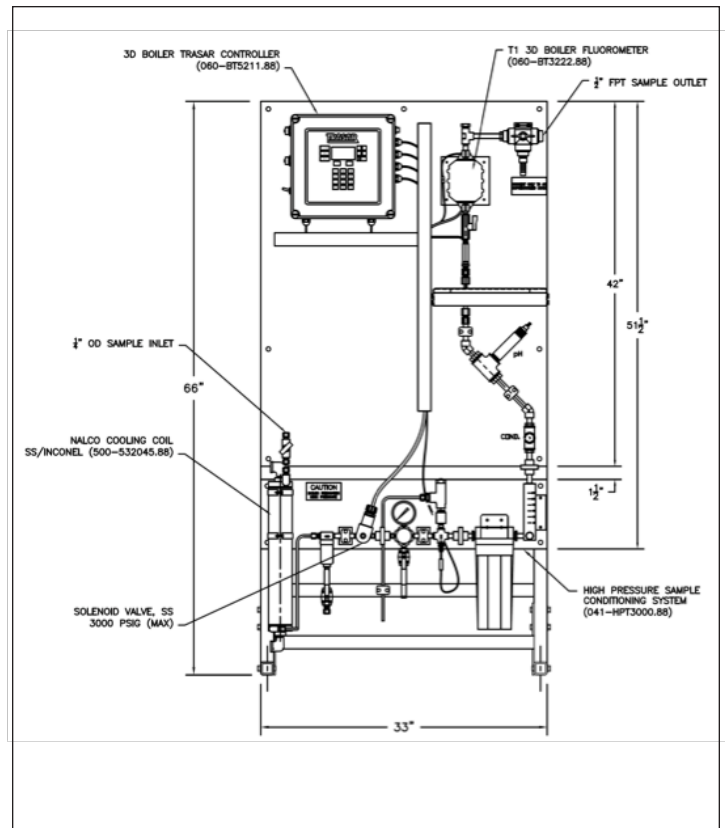
Part Number 060-BL5721OH.88

060-BLx54xxxx.88 Series



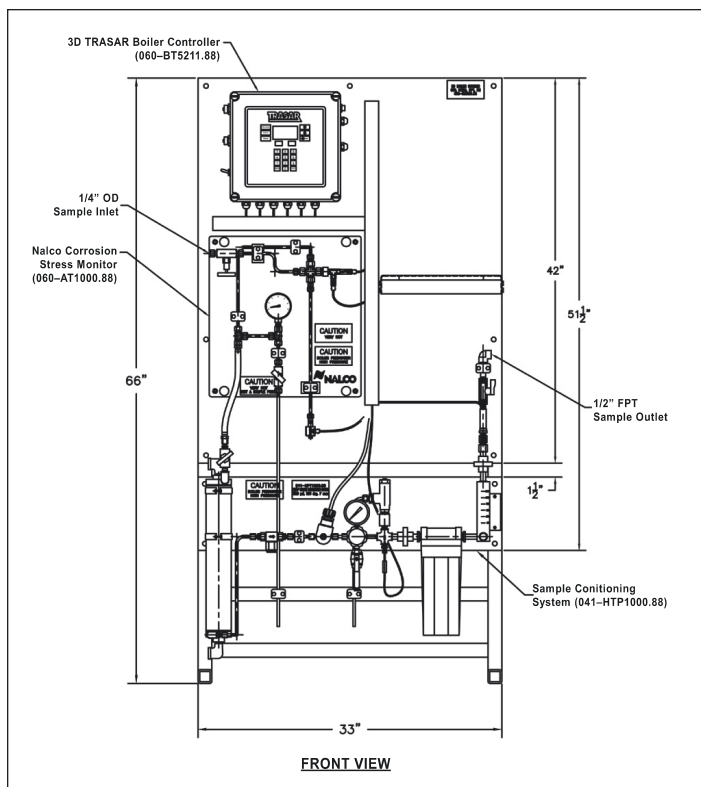
Part Number 060-BL5421BH.88

060-BLx56xxxx.88 Series



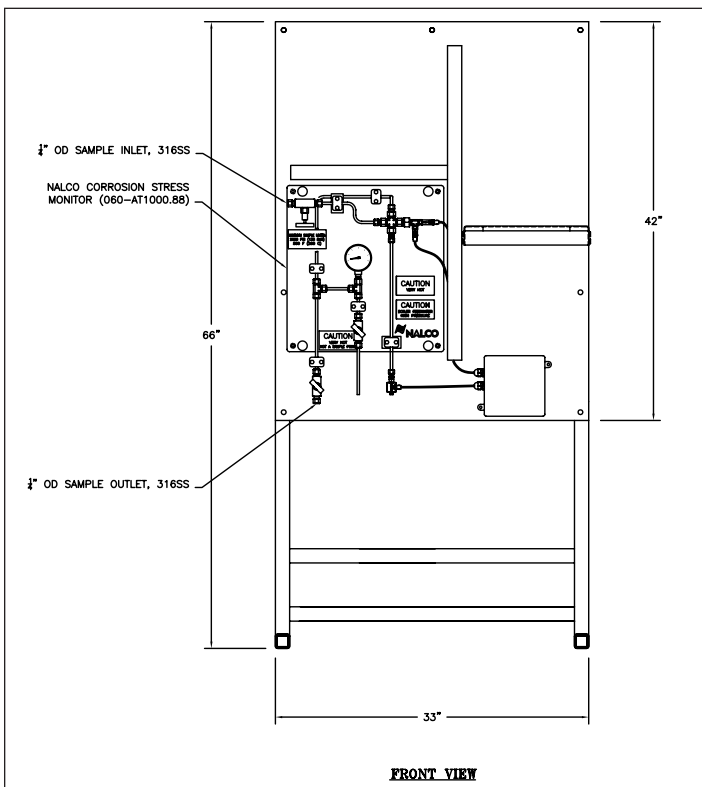
Part Number 060-BL5621OH.88

060-BLx53xxxx.88 Series



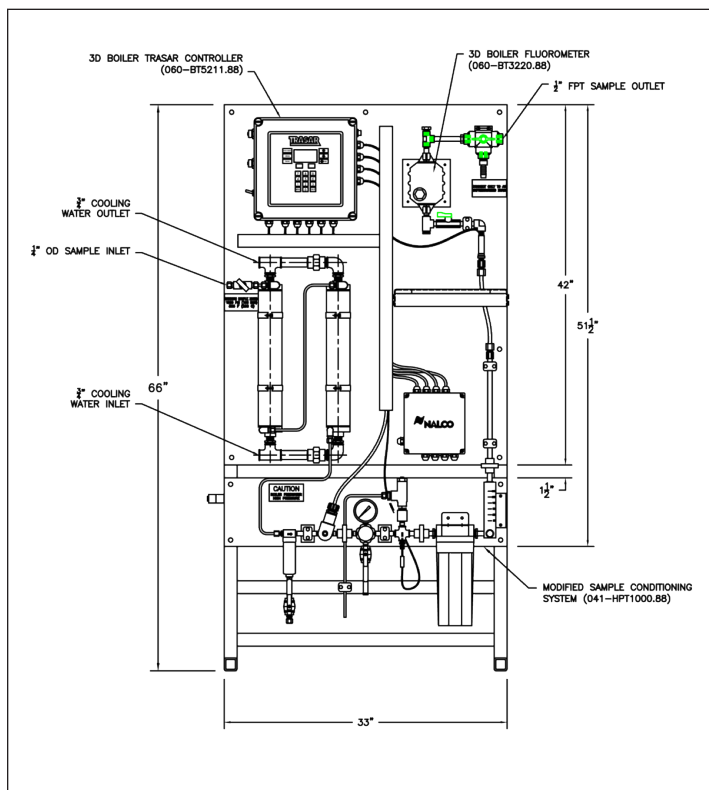
Part Number 060-BL5321.88

060-BLx52xxxx.88 Series



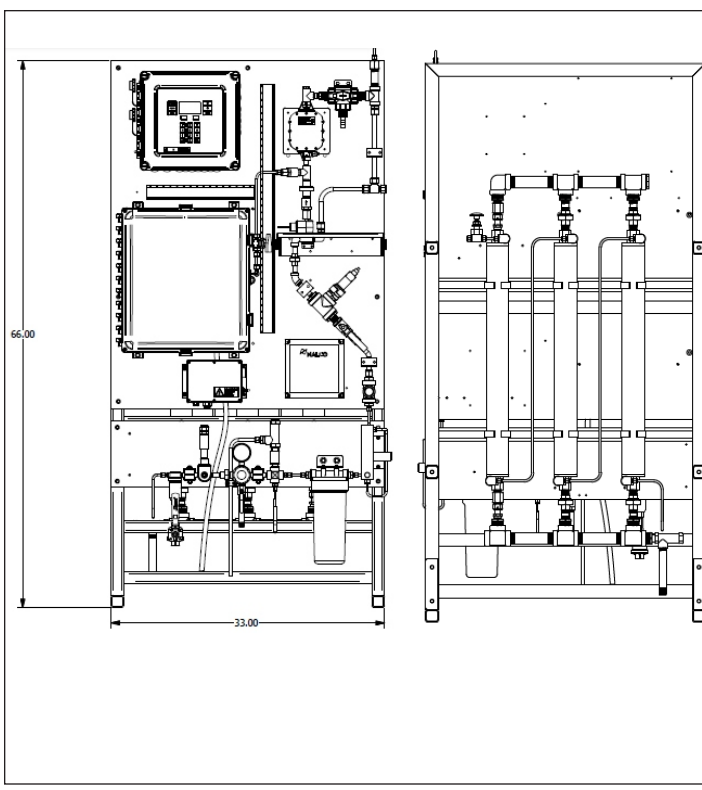
Part Number 060-BL5201.88

060-BLx61xxxx.88 Series



Part Number 060-BL6131B.88

060-BLx68xxxx.88 Series



Part Number 060-BL6841BL.88

3D BOILER TRASAR CONTROLLER
(060-BT5211.88)

42"

33"

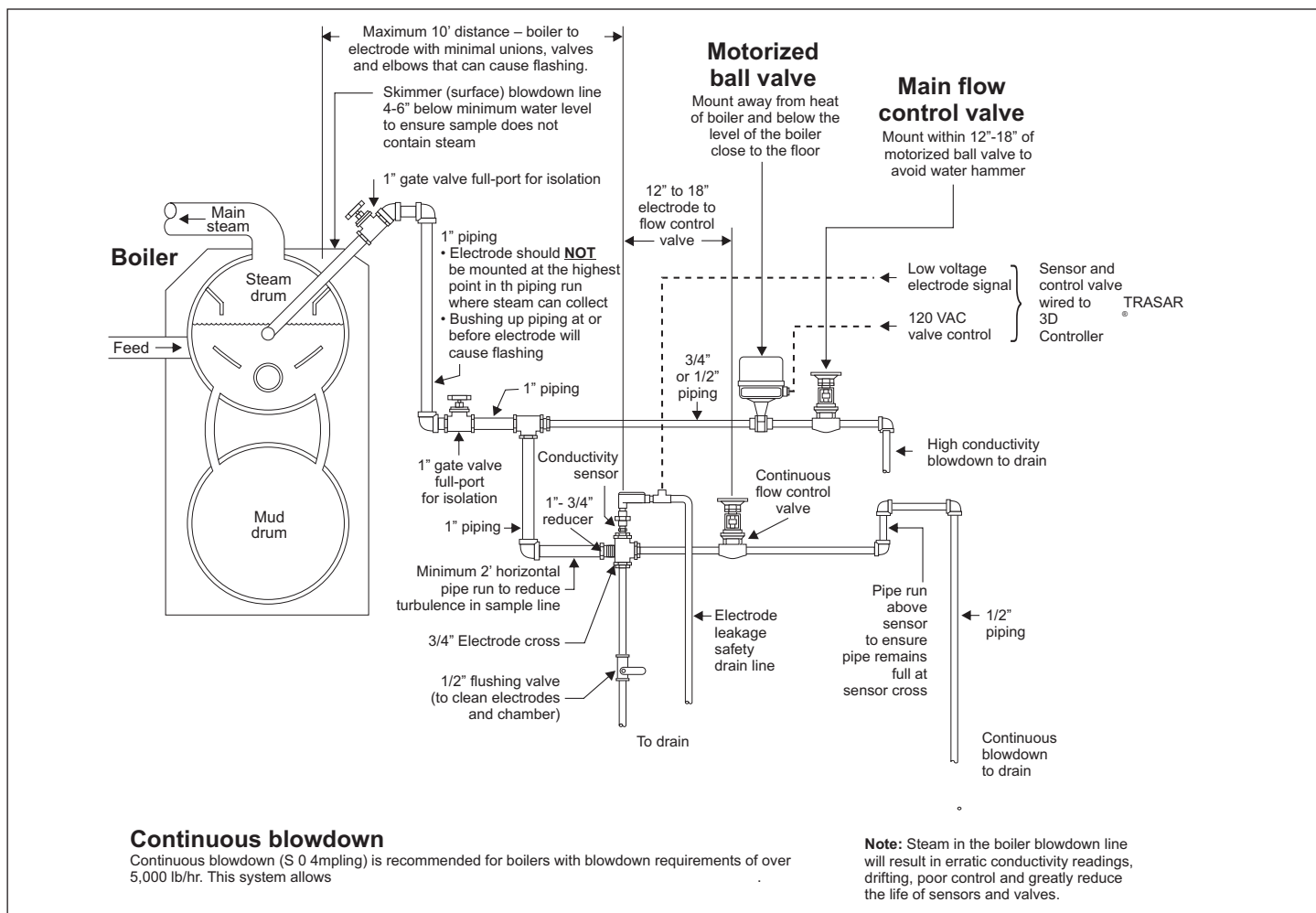
The diagram shows a rectangular control panel with a width of 33 inches and a height of 42 inches. Inside the panel, there is a square controller unit with a digital display and buttons. To the right of the controller is a vertical terminal block with several wires connected to it. Below the terminal block is a rectangular component labeled "NIVALCO" with four wires connected to it. The panel has mounting holes at the corners and along the edges.

The diagram illustrates a boiler blowdown system. A boiler with a steam drum is shown on the left. A blowdown line with a 1" gate valve full-port for isolation connects the steam drum to a piping system. Key components and labels include:

- Boiler**: The main vessel with a **Steam drum**.
- Maximum 10' distance**: Boiler to electrode with minimal unions, valves, and elbows that can cause flashing.
- Skimmer (surface) blowdown line**: 4-6" below minimum water level to ensure sample does not contain steam.
- 1" gate valve full-port for isolation**: Located at the boiler connection.
- 1" piping**: Initial section of the blowdown line.
- Conductivity sensor**: Mounted on the piping.
- 1" - 3/4" reducer**: Transition point in the piping.
- 1" gate valve full - port for isolation**: Second isolation valve.
- Minimum 2' horizontal pipe run**: To reduce turbulence in sample line.
- 3/4" Electrode cross**: Temperature sensor probe.
- 1/2" flushing valve (to clean electrodes and chamber)**: For sensor maintenance.
- To drain**: Outlet for the blowdown.
- 12" to 18" electrode to flow control valve**: Temperature sensor for the control valve.
- Motorized ball valve**: For flow control, mounted away from heat and below boiler level.
- Main flow control valve**: Mounted within 12"-18" of motorized ball valve to avoid water hammer.
- Low voltage electrode signal** and **120 VAC valve control**: Signals from the sensors to the **Sensor and control valve wired to 3D TRASAR Controller**.
- Pipe run above sensor to ensure pipe remains full at sensor cross**: A vertical riser for the conductivity sensor.
- 1/2" piping**: The riser pipe for the conductivity sensor.
- High conductivity blowdown to drain**: Final destination of the blowdown.
- Electrode leakage safety drain line**: A line for sensor leakage.

Timed blowdown
Timed blowdown (Sampling) is recommended for smaller boilers with blowdown requirements of less than 5,000 lb/hr. The boiler water is periodically sampled for conductivity. This is done in order to maintain the boiler water level and not 'over blow' the boiler.

Note: Steam in the boiler blowdown line will result in erratic conductivity readings, drifting, poor control and greatly reduce the life of sensors and valves.



Continuous boiler blowdown sampling

3D TRASAR Technology for Pre-Boiler Control – 060-BL55XXX.88 / 060-BL57xxx.88

Scale Control and Corrosion Stress Control

Controller	Fluorometer	Corrosion Stress Monitor		Sample Conditioning System			Universal Frame	Blowdown Relay Box	Feedwater pH & Conductivity	Nalco Part Number (USA)
		Lexan Shield	SS Enclosure	High-High Pressure < 2000 psig	High Pressure < 1500 psig	Low Pressure < 50 psig				
Y	T3	Y			Y		Y	Y	Y	060-BL5521BH.88
Y	T3		Y		Y		Y	Y	Y	060-BL5523BH.88
Y	T3	Y				Y	Y	Y	Y	060-BL5511BH.88
Y	T3		Y			Y	Y	Y	Y	060-BL5513BH.88
Y	T1	Y		Y			Y		Y	060-BL57210H.88
Y	T1		Y	Y			Y		Y	060-BL57230H.88
Y	T1	Y				Y	Y		Y	060-BL57110H.88
Y	T1		Y			Y	Y		Y	060-BL57130H.88

3D TRASAR Technology for Pre-Boiler Control – 060-BL54xxx.88 / 060-BL56xxx.88

Scale Control

Controller	Fluorometer	Corrosion Stress Monitor		Sample Conditioning System			Universal Frame	Blowdown Relay Box	Feedwater pH & Conductivity	Nalco Part Number (USA)
		Lexan Shield	SS Enclosure	High-High Pressure < 2000 psig	High Pressure < 1500 psig	Low Pressure < 50 psig				
Y	T3	NA	NA		Y		Y	Y	Y	060-BL5421BH.88
Y	T3	NA	NA			Y	Y	Y	Y	060-BL5411BH.88
Y	T1	NA	NA	Y			Y		Y	060-BL56210H.88
Y	T1	NA	NA			Y	Y		Y	060-BL56110H.88

3D TRASAR Technology for Pre-Boiler Control - 060-BL53xxxx.88

Corrosion Stress Control

Controller	Fluorometer	Corrosion Stress Monitor		Sample Conditioning System				Universal Frame	Blowdown Relay Box	Feedwater pH & Conductivity	Nalco Part Number (USA)
		Lexan Shield	SS Enclosure	High Pressure	Low Pressure	Cool & Depressurize	None				
Y	NA	Y		Y				Y	NA	NA	060-BL5321.88
Y	NA		Y	Y				Y	NA	NA	060-BL5323.88
Y	NA	Y			Y			Y	NA	NA	060-BL5311.88
Y	NA		Y		Y			Y	NA	NA	060-BL5313.88
Y	NA	Y					Y	Y	NA	NA	060-BL5301.88
Y	NA		Y				Y	Y	NA	NA	060-BL5303.88
Y	NA	Y				Y		Y	NA	NA	060-BL5341.88
Y	NA		Y			Y		Y	NA	NA	

Corrosion Stress Sensor Module – 060-BL52xxx.88

Controller	Fluorometer	Corrosion Stress Monitor		Sample Conditioning System				Universal Frame	Blowdown Relay Box	Feedwater pH & Conductivity	Nalco Part Number (USA)
		Shield	SS Enclosure	High Pressure	Low Pressure	Cool & Depressurize	None				
NA	NA	Y					Y	Y	NA	NA	060-BL5201.88
NA	NA		Y				Y	Y	NA	NA	060-BL5203.88
NA	NA	Y				Y		Y	NA	NA	060-BL5241.88
NA	NA		Y			Y		Y	NA	NA	060-BL5243.88

3D TRASAR Technology for Boiler Blowdown Control - 060-BL61xxxx.88 / 060-BL6841BL.88

Boiler Control

Controller	Fluorometer	Corrosion Stress Monitor		Blowdown Sample Conditioning System			Universal Frame	Blowdown Relay Box	pH & Conductivity	Automated Chemical Cleaning	Nalco Part Number (USA)
		Lexan Shield	SS Enclosure	High-High Pressure < 2000 psig	High Pressure < 1500 psig	Low Pressure < 50 psig					
Y	T3	NA	NA		Y		Y				060-BL61310.88
Y	T3	NA	NA		Y		Y	Y			060-BL6131B.88
Y	T1			Y			Y	Y	Y	Y	060-BL6841BL.88

Boiler Control Fluorometer Module - 060-BL60xxxx.88

Controller	Fluorometer	Corrosion Stress Monitor		Blowdown Sample Conditioning System		Universal Frame	Blowdown Relay Box	Nalco Part Number (USA)
		Lexan Shield	SS Enclosure	High Pressure	Low Pressure			
NA	T3	NA	NA	Y		Y		060-BL60310.88
NA	T3	NA	NA	Y		Y	Y	060-BL6031B.88

3D TRASAR Technology for Boiler Condensate Control - 060-BL50xxxx.88 / 060-BL53x3BH.88

Condensate Monitor

Controller	Fluorometer	Nalco Corrosion Monitor	Condensate Sample Conditioning System	Universal Frame	Blowdown Relay Box	Condensate pH & Conductivity	Nalco Part Number (USA)
Y	NA		Y	Y	Y	Y	060-BL50101.88
Y	NA	Y	Y	Y	Y	Y	060-BL50201.88
Y	NA	NCSM (Enclosed)	Low Pressure SCS	Y	Y	Y	060-BL5313BH.88
Y	NA	NCSM (Enclosed)	High Pressure SCS	Y	Y	Y	060-BL5323BH.88

3D TRASAR Hardness Response Program

Hardness Analyzer	Controller	Sample Conditioning System	Universal Power Supply	System Mounting			Nalco Part Number (USA)
				Frame	Wall	Back of Frame	
Y	NA	NA	Y	Y			060-HMF100.88
Y	NA	NA	Y		Y		060-HMW100.88
Y	NA	NA	Y			Y	060-HMB100.88

3D TRASAR Boiler System Numbering Convention					
Model Series	USA	Canada	Latin America		Asia-Pacific
	110 VAC/60 Hz	110 VAC/60 Hz	110 VAC/60 Hz	220 VAC/50 Hz	220 VAC/50 Hz
	AT&T Domestic	AT&T Global	AT&T Global	AT&T Global	NGG Supplied Locally
BL50xxx	060-BL50xxx.88	060-BLC50xxx.88	060-BLL50xxx.88	060-BLLC50xxx.88	060-BLPC50xxx.88
BL52xxx	060-BL52xx.88	060-BL52xx.88	060-BL52xx.88	060-BL52xx.88	060-BL52xx.88
BL53xxx	060-BL53xx.88	060-BLC53xx.88	060-BLL53xx.88	060-BLLC53xx.88	060-BLPC53xx.88
BL54xxx	060-BL54xx.88	060-BLC54xx.88	060-BLL54xx.88	060-BLLC54xx.88	060-BLPC54xx.88
BL55xxx	060-BL55xx.88	060-BLC55xx.88	060-BLL55xx.88	060-BLLC55xx.88	060-BLPC55xx.88
BL56xxx	060-BL56xx.88	060-BLC56xx.88	060-BLL56xx.88	060-BLLC56xx.88	060-BLPC56xx.88
BL57xxx	060-BL57xx.88	060-BLC57xx.88	060-BLL57xx.88	060-BLLC57xx.88	060-BLPC57xx.88
BL6xxxx	060-BL6xxx.88	060-BLC6xxx.88	060-BLL6xxx.88	060-BLLC6xxx.88	060-BLPC6xxx.88
Note: BL52xxx models do not require a power supply.					

Kits included with the 3D TRASAR Boiler System model numbers listed below. (North America only)											
	Part Number	BL50	BL52	BL53	BL54	BL56	BL55	BL57	BL60	BL61	BL68
Fluorometer Startup Kit (T3) *	500-BTSRKITLA.88				✓		✓		✓	✓	
Fluorometer Startup Kit (T1) *	500-BTSR1KITLA.88					✓		✓			✓
NCSM Accessory Kit	6018909		✓	✓			✓	✓			
* For shipping purposes the Fluorometer Start-up Kits included with the designated models do not contain acid. If acid is desired for use in periodic cleaning of the fluorometer flow cell then order 460-S0726.75 (HCl) or 460-S0355.88 (N2623 -oxalic acid) separately.											

Calibration Solutions and Reagents included in kits	
500-BTSRKITLA.88 Fluorometer Startup Kit (T3)	
460-S0980.75	TRASAR 3 Calibration solution, 1L bottle
460-S0299.75	Conductivity standard solution, 40 µS, 1L bottle
460-S0743.75	Conductivity standard solution, 200 µS, 1L bottle
460-S0407.75	pH standard solution, pH 7 buffer, 1L bottle
460-S0408.75	pH standard solution, pH 10 buffer, 1L bottle
500-BTSR1KITLA.88 Fluorometer Startup Kit (T1)	
460-S0910.75	TRASAR 1 calibration solution, 1L bottle
460-S0299.75	Conductivity standard solution, 40 µS, 1L bottle
460-S0407.75	pH standard solution, pH 7 buffer, 1L bottle
460-S0408.75	pH standard solution, pH 10 buffer, 1L bottle
6018909 NCSM Accessory Kit	
6018914	Grease, high-vacuum, 5.3 oz. tube
6018930	0.1 N KCl Refill solution, 250 ml bottle
6018931	3.8 M KCl Test solution, 250 ml bottle

3D TRASAR Technology for Boiler - Blowdown & Condensate Accessories

Supplemental Boiler Controllers

Controller	Relay Box	Nalco Global Gateway	Region	Power	Nalco Part Number (USA)
Y	Y	Y	US	115 VAC	060-BDC100.88
Y	Y	Y	CA	115 VAC	060-BDCC100.88
Y	Y	N	US + CA	115 VAC	060-BDC100A.88
Y	Y	Y	LA	230 VAC	060-BDCL100.88
Y	Y	Y	LA	115 VAC	060-BDCLL100.88
Y	Y	Y	AP+GC	230 VAC	060-BDCP100.88

Remote Conductivity Probe Assemblies

Application	5-500µS/cm	100-10,000µS/cm	Temperature Compensating	Probe Connection	Process Connection	Maximum Temperature & Pressure	Nalco Part Number (USA)
Condensate	Y	N	Y	3/4"	3/4"	250 psig@392°F (17.2 bar@200°C)	060-BCP100.88
Blowdown	N	Y	N	3/4"	3/4"	250 psig@392°F (17.2 bar@200°C)	060-BDP100.88
Blowdown	N	Y	Y	3/4"	3/4"	250 psig@392°F (17.2 bar@200°C)	060-BDP100C.88
Blowdown	N	Y	N	3/4"	1"	250 psig@392°F (17.2 bar@200°C)	060-BDP200.88
Blowdown	N	Y	N	3/4"	1-1/2"	250 psig@392°F (17.2 bar@200°C)	060-BDP300.88
Blowdown	N	Y	N	3/4"	3/4"	600 psig@482°F (41.4 bar@252°C)	060-BDP600.88
Blowdown	N	Y	Y	3/4"	3/4"	600 psig@482°F (41.4 bar@252°C)	060-BDP600C.88

Motorized Blowdown Valve & Flow Control Valve Packages

Motorized Blowdown Valve	Flow Control Valve	Process Connection	Maximum Temperature & Pressure	Nalco Part Number (USA)
Y	Y	1/2"	250 psig@313°F (17.2 bar@156°C)	041-BLR012.88
Y	Y	3/4"	250 psig@313°F (17.2 bar@156°C)	041-BLR034.88
Y	Y	1"	250 psig@313°F (17.2 bar@156°C)	041-BLR100.88
Y	Y	1/2"	600 psig@550°F (41.4 bar@287°C)	041-BLR012H.88
Y	Y	3/4"	600 psig@550°F (41.4 bar@287°C)	041-BLR034H.88

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Replacement Parts and Accessories

Replacement Probes	
Part Number	Description
6035385	Conductivity, low purity feedwater, replacement probe only with 4-ft cable (158°F/70°C)
6035386	Conductivity, high purity feedwater, replacement probe only with 4-ft cable (158°F/70°C)
6035384	Conductivity, blowdown, replacement probe only (392°F/200°C)
6034004	Conductivity, blowdown, compensating, replacement probe only (392°F/200°C)
6039154	Conductivity, blowdown, replacement only (X-long, to mount in 1" tee w/1" x 3/4" reducer) (392°F/200°C)
041-BP600.88	Conductivity, blowdown, replacement probe only (482°F/250°C)
041-BP600C.88	Conductivity, blowdown, compensating, replacement probe only (482°F/250°C)
060-BT3222.8	Fluorometer only (T1)
060-BT3220.88	Fluorometer only (feedwater) (T3)
060-BT3221.88	Fluorometer only (blowdown) (T3)
060-TR5227.88	Luer-lockfitting(fluorometer)
741-C00743.88	CapwithLuer-lockfitting(cleaningsolution)
991-05058542.88	NCSM ORP/RTD Replacement probe only
991-05058543.88	NCSM Reference probe
6050754	NCSM Reference probe tip (w/frit)
6035381	pH Replacement probe only, high-purity
060-TR5411.88	pH Replacement probe only, low-purity

Spares & Replacement Parts	
Part Number	Description
60446622	Adapter, 316 SS, 1" TFE ferrules (for pH probe)
991-05061451.88	Bracket,SS(SCS10"PP filter)
991-05061321.88	Bracket,SS(SCSflowmeter)
991-P01141.88	Clamp, pipe, 1/4" OD, SS (C-plate only)
991-C00745.88	Clamp, pipe, 1/4", black-PA (body only)
991-05059701.88	Clamp, tube, 1/4"OD, alum/SS (complete)
991-05048871.88	Clamp, tube, 1/4"OD, blue-PP/SS (complete)
6059682	Coil, 24 VDC (for 3-way solenoid valve)
991-19699314.88	Cross, SS, 1/4, FPT, 150# (SCS)
060-TR5226.88	Desiccant canister and indicator (fluorometer)
991-19010819.88	Ferrule (TFE) for HP pH probe tee (need 991-19010820.88)
991-19010820.88	Ferrule (TFE) for HP pH probe tee (need 991-19010819.88)
991-05061051.88	Filter housing, PP, 10" (SCS)
991-05061055.88*	Filter, 5 micron, PP, 10" (SCS)
991-05061056.88	Filter housing, PP, 5" (SCS-optional)
991-05061057.88	Filter, 5 micron, PP, 5" (SCS-optional)
991-05061711.88	Filter complete, 200 m, SS, 2800 psi, (feedwater)
991-05061713.88	Filter complete, 200 m, SS, 2800 psi, (blowdown)
991-05061712.88	Filter, element, 40 micron, SS, 2-1/4" (feedwater)
991-05061715.88*	Filter, element, 200 micron, SS, 2-1/4" (feedwater)
991-05061714.88	Filter, element, 200 micron, SS, 3-1/4" (blowdown)
991-05043142.88	Flow meter, 100-1500 cc/min
991-05060101.88	Flow switch
991-50554318.88*	Fuse, 2.5 A, 250V (output relay fuse)
6037161	Gauge, pressure gauge, 0-100 psi (SCS)

Part Number	Description
991-50588212.88	Gauge, pressure gauge, 0-2000 psi (NCSM)
6037162	Gauge, pressure gauge, 0-3000 psi (NCSM)
6039191	Tubing Kit, SS, 1/4" T x 12" LG (NCSM to SCS)
6044662	Nut (SS) and ferrule (TFE) set (for HP pH probe tee)
991-05061053.88*	O-Ring,PP filter
991-05043242.88	Pressure regulator (SCS)
991-01960681.88	Relay, SPDT, 120 VAC, 10A (for blowdown relay box)
991-19070215.88	Reducing coupling 1" x 3/4" NPT, black iron
991-01970443.88	RTD adapter, 1/8" OD tubing x 1/4" MNPT, (SCS)
991-05059831.88	RTD (SCS) (Requires adapter 991-01970443.88)
500-531062.88	Sample cooler, 1-ft ² , all SS (T3 systems)
500-532045.88	Sample cooler, 1-ft ² , Inconel coil/SS shell (T1 feedwater systems)
500-532047.88	Sample cooler, 2-ft ² , Inconel coil/SS shell (T1 blowdown system)
991-01868611.88	Union, PVC, 1/4" Socket (for SCS)
6059671	Union, 1/2" male VCO x 1/2" MNPT
6059672	Union, 1/2" female VCO x 1/2" FNPT
6009052	Valve, ball, PVC, 1/2", FNPT, Viton synthetic rubber,T-port(fluorometeroutlet)
991-05045141.88	Valve, ball, SS, 1/4" (SCS sample tap)
6036191	Valve,ball,SS,PEEK(SCSSSfilter)
991-05059691.88	Valve, check, PTFE, 1/4"
991-05043791.88	Valve, labcock, PVC, 1/4" FPT, EPDM, (fluorometerinlet)
991-05060032.88	Valve, needle valve, SS, (sample inlet)
991-01841381.88	Valve, relief valve, SS, (set @ 65 psi/4.5 bar)
6053142	Valve, relief, SS (set @ 100 psi/6.9 bar)
991-05043157.88	Valve, solenoid, 3000 psi, 120 VAC
991-05043151.88	Valve, solenoid, 1500 psi, 120 VAC
991-05043155.88	Valve, solenoid, 500 psi, 120 VAC
991-50431511.88	Valve, solenoid, 3000 psi, 240 VAC
991-05043156.88	Valve, solenoid, 1500 psi, 240 VAC
991-50431510.88	Valve, solenoid, 500 psi, 240 VAC
991-50431513.88	Valve, solenoid, 3-way (no coil)
991-05061052.88	Wrench,PP filter
6060294	Valve, solenoid, 3-way, complete with coil (for Chem-Clean)

NCSM Parts and Accessories	
Part Number	Description
6034335*	Battery, NCSM pre-amp cable
6026028*	Insulation wrap, ceramic, 2" x 50' (1 roll supplied with NCSM)
6037008	Junction box (for remote NCSM)
991-05060581.88	Knob (for NCSM Lexan shield)
6033766 *	NCSM calibrator
991-05060623.88	Shield, LEXAN (for NCSM)
6018909**	NCSM Accessory Kit, complete – includes parts listed below
6018911*	Syringe, 10 cc plastic
6018912	Hypodermic needle, special 14" SS
6018913	Electrode, 1/2" cell, with BNC, for calibration (sat. KCl, Ag/AgCl)
6018914	Grease, high-vacuum, 5.3 oz. tube
6018930*	0.1NKCIRefillsolution,250mlbottle
6018931	3.8 M KCl Test solution, 250 ml bottle
6031275	BNC BA80 Adapter

Notes:

*Recommended spare part

** Needed for Fluorometer, NCSM or conductivity calibration.

Add to initial system order.

Fluorometer Parts and Accessories

Part Number	Description
500-BTSRKIT.88 **	3D TRASAR T3 Boiler Startup Kit – includes the parts listed below
460-S0980.75 *	TRASAR 3 Calibration solution, 1L bottle
460-S0726.75	Hydrochloric Acid, 1:1, 1L bottle
460-S0299.75 *	Conductivity standard solution, 40 µS, 1L bottle
460-S0743.75*	Conductivity standard solution, 200 µS, 1L bottle
460-S0407.75 *	pH standard solution, pH 7 buffer, 1L bottle
460-S0408.75 *	pH standard solution, pH 10 buffer, 1L bottle
500-P2817.88	Flow cell brush, 16"
500-P0116.88	Beaker, 800 ml, plastic (3 each)
500-P2147.88 *	Syringe, 60cc, plastic (2 each)
500-BTSRKITLA.88	3D TRASAR T3 Boiler Startup Kit, less acid
500-BTSR1KITLA.88	3D TRASAR T1 Boiler Startup Kit - includes the parts listed below
460-S0910.75 *	TRASAR 1 calibration solution, 1L bottle
460-S0299.75 *	Conductivity standard solution, 40 µS, 1L bottle
460-S0407.75 *	pH standard solution, pH 7, 1L bottle
460-S0408.75 *	pH standard solution, pH 10, 1L bottle
500-P0116.88	Beaker, 800 ml, plastic (3 each)
500-P0118.88	Beaker, 250 ml, plastic (4 each)
500-P2817.88	Flow cell brush, 16"
500-P2147.88 *	syringe, 60cc, plastic (2 each)

Cables

Part Number	Description
060-TR546088	Cable, 1 ft., Ethernet internal jumper
6026390	Cable, 6 ft, NCSM, REF, stripped & tinned
6031277	Cable, 6 ft, NCSM, REF, w/pre-amp, stripped & tinned
991-05058545.88	Cable, 6 ft, NCSM, RTD
6035382	Cable, 4 ft, pH, high purity
060-TR5412.88	Cable, 6 ft, pH, low purity
060-TR0001.88	Cable adapter, USB to RS232
991-03509170.88	Cable, 2-conductor, 20 AWG, shielded, for 4-20 mA pumps (per ft)
6036776	Cable, 2-pair, 22 AWG, shielded, for conductivity probes. (per ft)
6033734	Cable, 3-pair, 22 AWG, shielded, for remote NCSM (per ft)
6033777	Cable, 4-pair, 22 AWG, shielded, for conductivity with RTD (per ft)
991-05047661.88	Ethernet crossover cable, 6' (2 m), orange
060-BT3231.88	Fluorometer cable, 4 ft. (1.2 m) (T1)
060-TR5221.88	Fluorometer cable, 4 ft. (1.2 m) (T3)
060-BT3230.88	Fluorometer cable, 10 ft. (3 m) (T3)
6059743	Fluorometer cable, 10 ft. (3 m) (T1)
991-05053481.88	Pigtail, 16/3 SJOW, 18" w/US plug
991-01928722.88	Service cord, 12/3 SJOW (no termination) 8 ft (2.4 m)

Optional Accessories

Part Number	Description
060-BT8000.88	Analog Input Module, 8-input, 120 VAC/60 Hz
060-BT8002.88	Analog Input Module, 8-input, 230 VAC/50 Hz
060-BDRB04.88	Relay box, 4-relay, 120 VAC/60 Hz
060-BDRBE4.88	Relay box, 4-relay, 230 VAC/50 Hz
060-HCP100.88	Feedwater conductivity & pH module, high-purity (Cond < 500 µS/cm)
060-TR5270.88	LAN router
521-OM021188	Manual, Installation and Operation
521-OM0290.88	Manual, addendum for TRASAR T1 system
AV-1091	DVD, Nalco 3D TRASAR Boiler Technology – Installation
AV-1092	DVD, Nalco 3D TRASAR Boiler Technology – Blowdown Conductivity Control
AV-1093	DVD, Nalco 3D TRASAR Boiler Technology – Assembly, Start-up and Control
TK-187	DVD, Nalco 3D TRASAR Boiler Technology – Demonstration of Nalco Corrosion Stress Monitor Fundamentals
041-LPT1000.88	Feedwater Sample Conditioning System, 50 psi, 500°F, 120 VAC/60 Hz
041-LPT2000.88	Feedwater Sample Conditioning System, 50 psi, 500°F, 230 VAC/50 Hz
041-HPT1000.88	Feedwater Sample Conditioning System, 1500 psi, 500°F, 120 VAC/60 Hz
041-HPT2000.88	Feedwater Sample Conditioning System, 1500 psi, 500°F, 230 VAC/50 Hz
041-HPT3000.88	Feedwater Sample Conditioning System, 2000 psi, 600°F, 120 VAC/60 Hz (Inconel/SS cooler)
041-HPT4000.88	Feedwater Sample Conditioning System, 2000 psi, 600°F, 230 VAC/50 Hz (Inconel/SS cooler)
041-HPT5000.88	Blowdown Sample Conditioning System, Tri-Cooler, 2000 psi, 600°F, 120 VAC/60 Hz (Inconel/SS coolers)
041-HPT5001.88	Blowdown Sample Conditioning Module, 2000 psi, 600°F, 120 VAC/60 Hz (no sample coolers)
041-HPT5002.88	Tri-Cooler Assembly (3 x 2-ft ² Inconel/SS coolers)
041-CD0100.88	Sample Cooling-Depressurizing System, 2800 psi (post instrument)

Part Number	Description
6042711	Sample Quill, 4" Quill, 304SS, 1/2" FNPT
6042712	Sample Quill, 6" Quill, 304SS, 1/2" FNPT

Notes:

*Recommended spare part

** Needed for Fluorometer, NCSM or conductivity calibration.
Add to initial system order.

Conductivity and pH Standard Solutions

Part Number	Description
001-H07641.88**	Conductivity standard solution, 10,000µS/cm, 500mL
001-H07642.88**	Conductivity standard solution, 5000µS/cm, 500mL
460-S0297.75**	Conductivity standard solution, 3000µS/cm, 1L
460-S0298.75**	Conductivity standard solution, 600µS/cm, 1L
460-S0300.75**	Conductivity standard solution, 500µS/cm, 1L
460-S0743.75**	Conductivity standard solution, 200µS/cm, 1L
460-S0299.75**	Conductivity standard solution, 40µS/cm, 1L
460-S0408.75**	pH standard solution, pH 10 buffer, 1L
460-S0407.75**	pH standard solution, pH 7 buffer, 1L

Boiler NCM100 Probe and Accessories

Part Number	Description
400-NCMP6.88	Boiler NCM100 probe assembly w/ 3/4" compression fitting
400-NCMAC11.88	Boiler NCM100 probe tee (1" x 3/8")
400-NCMAC12.88	Boiler NCM100 probe reducer (1" x 3/4")
400-NCMAC13.88	Boiler NCM100 probe housing kit (tee and reducer)
400-NCMAC14.88	Boiler NCM100 probe cable (6 ft.)
500-P6113.88	Boiler NCM100 probe O-ring (ea.)
500-P6116.88	Boiler NCM100 probe MS tips (2 ea.)

Notes:

*Recommended spare part

** Needed for Fluorometer, NCSM or conductivity calibration. Add to initial system order.

Hardness Analyzer

Part Number	Description
060-HMABOX1.88	Hardness analyzer module
060-HM24VDC1.88	Power supply, 24VDC, 115/230 VAC, 50/60 HZ
060-HMSVA10.88	Sample inlet by-pass valve assembly
060-HMVCA10.88	Sample discharge vent-cross assembly
060-HMWA10.88	Weir assembly
6057828	Basket Strainer, 1/4" MPT, 10 micron
991-05043143.88	Flow meter, 1/8" FPT, 40660 mL/min
460-S0355.88	Nalco 2623, 2L bottle (Iron cleaning solution)

Note: Solution bags are only available as "sets".

Part No.	Description	Replace Reagent Bags
460-S5048.88	Hardness Analyzer Reagent Set (460-S5040.88 & 460-S5041.88 bags)	8 weeks (measurement every 30 minutes) 4 weeks (measurement every 15 minutes)
460-S5049.88	Hardness Analyzer Calibration Set (460-S5042.88 & 460-S5043.88 bags)	7 months (monthly calibrations)

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