



Odin® Cobra 200/100 Specificationⁱ

The compressed air foam system shall be a high-output, engine-driven, module-type design. It shall include all of the following necessary components built into a compact frame assembly.

The CAFS shall be designed to discharge water only, air only, foam solution only or compressed air foam from the same discharge outlet. In addition, the consistency of the compressed air foam (expansion ratio), wet/dry shall be fully adjustable.

Engine

The power to drive the system shall be provided by a *Deutz* model BF4L2011, air/oil-cooled, direct-injection, and pressure lubricated, turbo-charged diesel engine. The heavy-duty rating for this engine is 73 hp @ 2500 rpm. Automotive engines or ratings will not be used. The engine shall have a cylinder head and crankcase of grey cast iron without liners. A cooling blower with a guard shall be provided along with a 14 VDC, 60-amp alternator and engine oil cooler with a thermostatic oil valve.

Water Pump

The water pump shall be a *Darley* model 2-1/2 AGE single-stage, centrifugal pump with a vertically split aluminum case and bronze impeller on a stainless steel shaft. It is designed to provide up to 250 gpm (946.3 L/min) of plain water flow and pressures up to 250 psi (15.5 b). The pump seal shall be of a mechanical design. Helical cut gears shall be utilized in the pump transmission.

Air Compressor

The air compressor shall be of the oil injected rotary screw type, designed and installed to supply a minimum of 125 cfm @ 125 psi (2831.7 L/min @ 8.6 b) of free air at maximum engine rpm. The compressor air/oil receiver shall be built and designed by the compressor manufacturer. A spin-on oil filter shall be integrated into the compressor system. Replacement elements shall be readily available.

A pneumatic modulating inlet valve mounted on the air end inlet shall control the compressor. An *AutoOdin* balancing system shall be provided to automatically maintain the air pressure within plus- Or - minus 5% of the water pump pressure throughout the CAFS operating range.

All air lines shall be rated to a minimum of 250 psi (17.2 b). All control air fittings shall be of brass, stainless steel or chrome construction. Stainless steel or brass check valves shall be utilized at air injection points to prevent water/solution back-flow into air lines.

The cooling water to the heat exchanger shall be supplied through a dedicated, filtered line from the unit's water pump. Water shall flow through the heat exchanger whenever the water pump is operating. The air compressor cooling system shall incorporate a thermostat that maintains the system oil temperature within 168°F (75.6°C) to 225°F (107.2°C) range. The system shall be capable of maintaining recommended operating temperatures throughout the full operational range of ambient temperatures up to 115°F (46.1°C). A dry cartridge type air filter shall be provided on the compressor air intake.

Drive System

The water pump shall be directly driven using a centaflex coupling on an extension shaft in line with the crankshaft of the engine. The compressor shall be mounted to the water pump bell housing and will be belt-driven using a *Gates Poly-Chain*^{®ii} drive system.

Foam Proportioner

The foam proportioner shall be a *FoamPro* model 2001 automatic, 12 VDC, direct-injection system. It will provide push-button control of foam proportioning rates from 0.1% to 9.9%, in 0.1% increments. The pump

ⁱSpecifications are subject to change and improvements without notice.

ⁱⁱ [®] *Gates Poly-Chain* is a registered trademark of the Gates Corporation, dba The Gates Rubber Company



output shall be 2.6 gpm @ 150 psi (9.84 L/min @ 10.3 b). The motor shall be rated at ½ hp with a maximum amp draw of 40 amps. The proportioner shall be capable of using different types of liquid foam concentrates. This complete system will be mounted within the module.

Electrical System

All electrical equipment installed by the manufacturer shall conform to current automotive electrical system standards and the requirements of the applicable NFPA apparatus standards. The wiring shall be individually and permanently color and function coded. The installation shall meet SAE Standard J1128 in its latest edition for GXL or SXL temperature rating.

All exposed wiring shall run in loom with a minimum of 280°F (137.8°C) rating. All wiring loom shall be properly supported and attached to frame members along the entire run. At any point where wire or looms must pass through metal, rubber grommets shall be installed to protect the wire from abrasion.

The main low voltage electrical terminal block and circuit breaker panel shall be provided behind the pump operator's panel in a location providing easy service access. The electrical connections shall be made using heat shrink and/or weatherproof connectors. All electrical circuits shall be protected with ATO blade type fuses.

Engine Compartment Light

An engine compartment light shall be installed in the module. The panel lights switch shall control the engine compartment light.

Priming System

A *Darley* 12 VDC electric, oil-less, rotary-vane priming system shall be utilized. The primer is capable of priming the water pump through 20' of hard suction hose with a 10' lift. Primer controls and instruction plate shall be mounted on the operator's panel.

Relief Valve

The pump shall be equipped with a *Darley* automatic pressure control device.

The relief valve control (pilot valve) shall be protected from malfunction due to sand or other sediment in the water by a strainer, which can be removed, cleaned, and replaced from the operator's panel while the pump is operating.

The relief valve indicator lights shall be provided and mounted on the pump panel adjacent to the pilot valve assembly. The indicator lights are to be amber, marked OPEN to indicate the relief valve is bypassing and green marked CLOSED to indicate the valve is closed.

Plumbing, Hose and Lines

All piping shall be stainless steel. Use of grooved end pipe couplings is required for flexibility and movement of system components on mobile equipment. All air compressor control lines shall be of stainless steel outer braid *Teflon* liner or supplied by the compressor manufacturer. Hydraulic hoses will only be used for air injection lines and not control air lines. Flexible piping may be used where applicable. Check valves are required throughout the system to maintain integrity and shall be placed so that the air, water foam and foam solution do not inadvertently mix. One (1) master drain valve shall be provided on the control panel to completely drain the system to prevent freeze damage.

Tank to Pump

There shall be a 2½" tank-to-pump suction valve fitted in the module and controlled from the operator's panel with a push/pull T-handle control.

Tank to Pump Check Valve

A 2½" check valve shall be installed in the water pump inlet plumbing, between the water tank and the pump inlet.



Inlets

There shall be a 2½” NH connection with cap on the operator’s panel for drafting.

Direct Tank Fill

There shall be a 2½” gated valve with a 2 ½” Female NPT on the operator’s panel for direct tank fill operations with a pressurized water source.

Tank Refill

There shall be a 1.5” tank refill valve, with push pull operator on the panel.

CAFS Outlets

There shall be a minimum of Three (3) mix points. Each mix point will consist of an independent control on the operator’s panel for air injection and an independent control on the operator’s panel for foam solution. Two (2) Crosslay mix points will have 2” plumbing with 1½” discharge outlets. One (1) Panel discharge to be 2” valve, with 2” plumbing. All outlets will be independent mix points for air and foam solution and shall be controlled from the operator’s panel. The CAF mix point controls shall be grouped together on the panel. Locking, push/pull, T-handle controllers inlaid with calibrated wet/dry foam labels shall be used for water and quarter-turn, ball valves for air injection points. Discharge threads are to be 1 ½” NH on crosslays.

Module Frame

The frame shall be constructed of aluminum and designed for rigorous fire service. The top of the module shall be a computer-cut, aluminum diamond-plate material, hinged for a complete service access door. The top access door shall use pneumatic gas shocks to maintain the door in the open position. The cab-side of the module shall be covered with a removable sheet of aluminum diamond plate.

The top of the module shall have two (2) pre-connect hose trays, installed complete with dividers. Both pre-connects shall be CAFS capable. They shall be sized to hold a minimum of 150 ft. of hose. **Discharge threads are to be 1 ½” NH.**

The module lid shall have an engine cooling air exhaust duct, which **MUST** be left open and free to emit hot air from the module.

Corrosion Resistance Treatments

Dielectric tape (laminating type UHMW) is used through out the construction of the module for dissimilar metal contact surfaces. This will include, but not be limited to control panel to frame, engine mounts to frame, and solution injection unit to frame.

All SS screws, which secure the SS panel to the aluminum frame, will be treated with dielectric liquid. The majority of fasteners throughout the module will be SS. All electrical ground connections to the frame will be treated with dielectric silicone compound. Wire ends will have waterproof and corrosion resistant shrink tube, adhesive lined type terminals and connectors.

All electrical plugs in the module will be environmentally sealed Deutsch type. The entire surface of the electric fuse / connection box will be treated with a urethane seal coat, to seal out moisture

Control Panel

A brushed stainless steel, laser-cut control panel shall be provided on the operator’s side of the module. A stainless steel engine control door shall be mounted to the control panel, which shall be of a water resistant design. The following items shall be positioned and clearly marked in a logical manner on the control panel to provide for simple and easy operation.

1. Shielded Control Panel Light Cluster
2. Water Tank Level Gauge



3. Foam Tank Level Gauge A
4. Auxiliary Air Outlet
5. Foam Proportioner System Control
6. 4" Master Water Pressure Gauge
7. 4" Master Air Pressure Gauge
8. 4" Master Inlet Compound Gauge
9. Pump Test Ports
10. Primer Control
11. Vernier Throttle
12. Operation Instruction Placard
13. Master Drain Valve
14. Relief Valve
15. Three (3) Separate Sets of Mix Point Controls
 - a) Water Solution Valve
 - b) Quarter-Turn Air Injection Control Valve
 - c) Quarter-Turn Mix Point Pressure Drain Valve
 - d) Mix Point Pressure Gauge 2½ "
16. 2½" NH Male Suction Inlet with Cap & Lanyard
17. 2½" NH Female Swivel Direct Tank Fill Inlet with Plug & Lanyard
18. Locking, Push/Pull, T-Handle Valve for Direct Tank Fill
19. Locking, Push/Pull, T-Handle Valve for Tank to Pump
20. Locking, Push/Pull, T-Handle Valve for Tank Refill
21. 2½" NH Male CAF with Cap & Lanyard
22. Electrical Door
 - a) Engine Temperature Gauge
 - b) Compressor High Temperature Light
 - c) Compressor Temperature Gauge
 - d) Engine oil
 - e) Voltmeter
 - f) 97dB Audible Alarm
 - g) Panel Light Switch
 - h) Loaf Control Panel

Labels

All controls, inlets and discharges shall be clearly labeled. The labels shall comply with applicable NFPA standards.

Testing

The completed unit shall undergo a manufacturer's run-in test prior to delivery. The engine, pump and air compressor shall be operated for a minimum period of six (6) hours, during which time the test operator shall monitor and record the functions and performance of each system component. Compressed air foam shall be produced during the test.

This testing shall be performed to ensure proper system operation and performance prior to shipment. The manufacturer shall provide written certifications that the tested unit meets all performance criteria contained herein (NFPA). Water flow performance shall be tested in accordance with NFPA 1901. The pump will meet the stated flow as per specifications below, in the performance section. System to meet all Airflow performance shall be measured with a temperature and pressure compensated air flow meter.

Manuals

One (1) copy of the *Operation and Maintenance Manual* and a CD copy shall be provided to the purchaser with each unit. This manual shall include detailed instructions in the operation and maintenance of the overall unit, engine, water pump, and air compressor and foam proportioner.



Dimensions

Length	69"	(175.26 cm)
Width	36"	(91.44 cm)
Height	65"	(165.1 cm)
Weight	2,200 lbs.	

Performance

Water Pump	250 gpm @ 150 psi	(946.3 L/min @ 10.3 b)
Water Pump Performance	175 gpm @ 200 psi 150 gpm @ 250 psi	
Air Compressor	130 cfm @ 125 psi	(3681.2 L/min @ 8.6 b)
Simultaneous Flow (NFPA)	200 gpm & 100 cfm @ 125 psi	
Simultaneous Flow	220 gpm & 125cfm @ 100 psi	
Engine Horsepower	73 hp @ 2500 rpm	
Fuel Use @ Full Load	4.2 gph	(15.9 L/hr)

Warranty

Engine	1 year
Compressor	1 year
Water Pump	3 year / 3000 hours
Chemical Injector	1 year
Water Tank	Lifetime

All fabrication and materials are warranted for a period of two (2) years barring accidents, abuse or negligence. Excluding from warranty are all consumables and parts subject to routine replacement. We will repair or assist in the repair or replacement of the product in its entirety.

Cobra Options

The list of options, which follow, can be added to the standard Cobra module according to your specifications and needs of operation. These options are not included in the base price of the Cobra module.

Water Tank

The water tank shall be rectangular in configuration and shall have a capacity based on the chassis GVW. The tank shall be constructed of ½” polypropylene sheet. All joints and seams are to be nitrogen welded.

The tank cover shall be constructed of ½” polypropylene and shall incorporate hold-downs to assist in keeping the cover rigid under fast filling conditions. The cover shall have a combination vent and manual fill tower. The tower shall have a hinged cover and a ¼“ thick polypropylene screen.



There shall be two (2) standard tank outlets; one for the tank to pump suction line and one for the tank fill line. An anti-swirl plate shall be installed at the tank-to-pump outlet. A manufacturer's warranty shall be included for the tank.

A 25-gallon (94.6 liter) polypropylene foam reservoir shall be provided as an integral part of the booster tank and shall contain a low-level sensor in the bottom of the tank to signal when the foam reservoir needs to be filled. The tank shall be plumbed to supply the foam proportioner pump with a minimum 3/4" hose (size varies per customer specifications).

The tank shall include all fittings, adapters, senders, switches and hoses necessary for tank to module connections.

Remote Start with Throttle Rocker

The remote control panel shall be pre-wired with plug-in connectors for ease of installation. The standard wire harness length is twenty-five feet (25'). The remote start option shall include the throttle rocker actuator mounted to the throttle linkage on the engine. The assembly shall include the following components mounted on a placard with the necessary labels permanently painted on the placard.

- 1) Battery
- 2) Glow plug
- 3) Eng Oil psi
- 4) Eng temp
- 5) Compressor temp
- 6) Low water psi.
- 7) FoamPro Remote On / Off Control (only available w/ FP 2001) **AND/OR**
FRC Tank Vision Mini Water Tank Level Gauge
- 8) Throttle Rocker Switch
- 9) Tachometer
- 10) Hourmeter
- 11) Ignition Switch
- 12) 97dB Audible Alarm

Foam Pro Electronic Dual Tank Valve

A *FoamPro* Electronic Dual Tank Valve System shall be provided. The system shall include a solenoid operated valve assembly, a panel placard with switches and lights, check valves electronic module, strainers and interface cables. This system will shift between a class "A" foam tank and a class "B" foam tank. There will be an automatic water flush cycle to prevent cross contamination of the 2 types of foam.



COBRA CONTROL PANEL

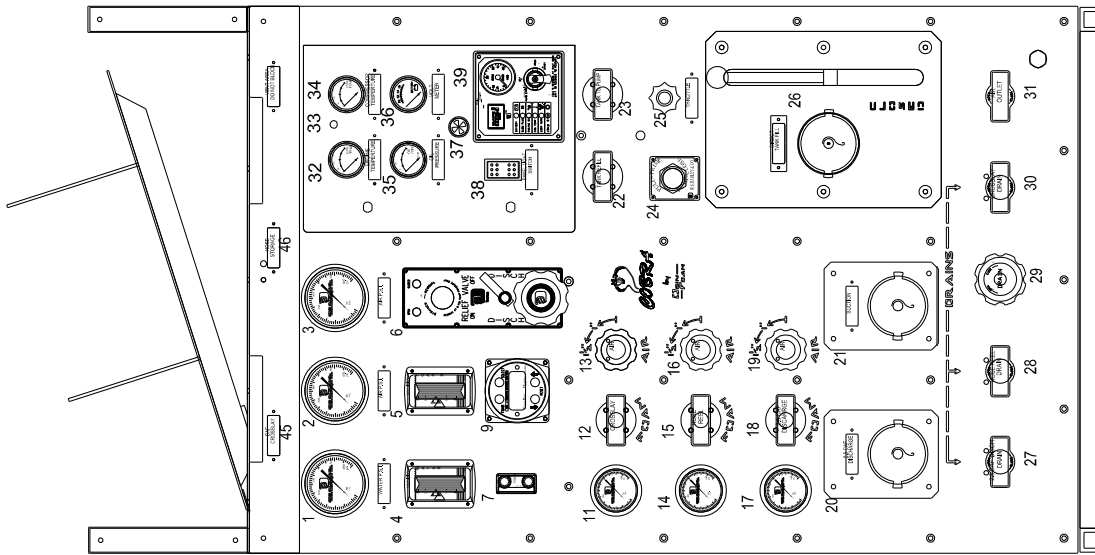
CONTROL PANEL

ELECTRICAL DOOR

- | | | |
|--------------------------------------|--------------------------|---------------------------|
| 1. WATER PRESSURE GAUGE | 19. AIR VALVE | 32. ENGINE TEMP. GAUGE |
| 2. AIR PRESSURE GAUGE | 20. WATER ONLY DISCHARGE | 33. COMPRESSOR TEMP LIGHT |
| 3. INLET PRESSURE GAUGE | 21. SUCTION VALVE | 34. COMPRESSOR TEMP GAUGE |
| 4. WATER LEVEL GAUGE | 22. TANK REFILL VALVE | 35. ENGINE OIL GAUGE |
| 5. FOAM LEVEL GAUGE A | 23. TANK TO PUMP VALVE | 36. VOLTMETER |
| 6. FOAM LEVEL GAUGE B | 24. PRIMER | 37. PANEL LIGHTS |
| 7. RELIEF VALVE | 25. THROTTLE | 38. ALARM |
| 8. PRESSURE TEST PORTS | 26. DIRECT TANK FILL | 39. LOFA CONTROL PANEL |
| 9. FOAMPRO CONTROLLER FOR TANK A,B | 27. 2.5 CAF DISCHARGE | |
| 10. FOAMPRO 2001 | 28. HOSE REEL DRAIN | |
| 11. CROSSLAY PRESSURE GAUGE | 29. MASTER DRAIN | |
| 12. CROSSLAY PUSH/PULL | 30. CROSSLAY DRAIN | |
| 13. AIR VALVE | 31. AIR OUTLET | |
| 14. HOSE REEL PRESSURE GAUGE | | |
| 15. HOSE REEL PUSH/PULL | | |
| 16. AIR VALVE | | |
| 17. 2.5 CAF DISCHARGE PRESSURE GAUGE | | |
| 18. 2.5 CAF DISCHARGE PUSH/PULL | | |

MAIN LID

- | |
|------------------|
| 45. CAF CROSSLAY |
| 46. HOSE STORAGE |



DRIVERS VIEW

NOTES:

ODIN FOAM

TOLEDO, OREGON 97391 - 541.336.5067

COBRA
CONTROL PANEL LEGEND

DATE: 11.15.05	COBRAPANEL
DRWN: HÄGER	
SCALE:	



Odin® Cobra 200/100	Engine Driven C.A.F.S.
Standard Equipment	
<ul style="list-style-type: none"> • Engine – Deutz Model BF4L2011 Air/Oil Cooled, Direct Injected, 73 hp, Turbo Charged Diesel Fueled, 12VDC, Electric Start, Vernier Throttle • Control Panel – Illuminated, Laser Cut, Brushed Stainless Steel Panel with all Engine, Air Compressor, Water Pump and Foam Injection System Controls and Instruments Installed • Water Level Gauge • Foam Level Gauge • Pressure Relief Valve • Air Compressor – Rotary Screw Compressor Assembly, Auto Odin Balance Valve, Stainless Steel Braided Teflon Air Control Lines, Compressor Temperature Gauge with Alarm • Auxiliary Air Outlet 	<ul style="list-style-type: none"> • Pump System – Darley Model 2½AGE with Three (3) Independent CAF Discharge Mix Points One (1) 2-1/2” Tank to Pump Suction Inlet and One (1) 2½” Suction Inlet, with cap, , One 2½” NH Female Swivel Direct Tank Fill Inlet with 2½” Valve, Master Drain Valve, 12-VDC Electric Primer System and Stainless Steel Plumbing • Frame – Lightweight Aluminum Frame, Latched Doors for Engine and Foam Proportioner System Maintenance Access • Lid – Precision Computer Cut, Ventilated, Hinged, Gas Shock Lift Struts, Latched, Fully Assembled Lid • Foam Proportioner System – FoamPro Model 2001 System
Options	
200 to 400 Gallon Water / 25 Gallon Foam Poly Tank with Tank Kit (<i>shipped loose</i>)	
<i>FoamPro</i> Powerfill Foam Refill System (<i>shipped loose</i>)	
<i>FoamPro</i> Electronic Dual Tank System (<i>shipped loose</i>)	
<i>Foam Pro</i> 1601 Proportioner (<i>Replaces FoamPro 2001 proportioner</i>)	
<i>Foam Pro</i> 2002 Proportioner (<i>Replaces FoamPro 2001 proportioner</i>)	
Remote Start with Throttle Rocker – Includes Mini Panel, Ignition Switch, Low Oil Pressure Light, System High Temperature Light, Water Level Indicator, Low Water Pressure Light, Throttle Rocker Switch, Electric Throttle Installed on Linkage, 25’ of Coded Wire with Plug Connectors. Tested (<i>Shipped Loose</i>)	
Shut-down Safety Circuits	