

# PFI-750

## Precision Fluid Injection

Gas extraction from drilling fluid and its analysis remain a crucial source of information for drilling any well, serving to continually enhance both operational safety and reservoir evaluation. Through several decades, the gas extraction device (gas trap) has seen some improvements in efficiency and consistency of agitation and minimizing of inconsistent ambient air dilution - implemented in the QGM™\* gas trap.

Constant Volume Trap (CVT) implementation, largely by controlled pump rate of mud into a non-immersed gas trap, was introduced more recently to address the open bottom gas trap issues such as inconsistent fluid refresh rate, eddy mud resampling, and inconsistent mud level or volume. Additionally, it allowed mud to be sampled further upstream of the flowline improving early detection and quantification by capturing volatile hydrocarbons before they full escape into the atmosphere.

Unfortunately, many CVT manufacturers did not integrate QGM™ design characteristics into the system and thus still failed to deliver consistent gas extraction benefits. Furthermore, excessive number of moving parts in the popular designs, coupled with poor pump hose material leading to more rapid cuttings build up caused by finer filter mesh, and frequent agitator blade failures all contributed to minimal adoption of CVT-QGM type gas extraction.

PFI-750 is designed to deliver identical benefits as with a QGM™ trap and uses high performance hose material for much longer CVT service life. With integration of a variable frequency drive and precision gear speed reducers, constant fluid injection rate is assured, regardless of motor power / voltage variations.

With precisely maintained mud sample refresh rate, industry-proven mud agitation effectiveness and minimal maintenance, PFI-750 offers the most viable path for CVT-QGM to become the gas extraction standard device used in every rig by the operator, drilling contractor and service company.

\* Quantitative Gas Measurement gas trap was jointly developed by Texaco Inc. and Gas Research Institute.



## Specifications

### **Model**

PFI-750

### **Application**

Liberation of gaseous content entrained in drilling fluid via agitation; constant drilling fluid sample volume and sample refresh rate selectable

### **Implementation**

Constant volume injection rate is via a Variable Frequency Drive (VFD) precisely controlling a fixed volume transfer pump speed

Constant volume in gas trap chamber is maintained via bottom inlet and overflow arrangement  
Constant agitation RPM is maintained via VFD

### **Agitation and Fluid Injection Rate Range**

Agitation: 1500 to 2700 RPM

Fluid Injection: 0.9 to 1.5 gpm (3.4 to 5.7 lpm)

### **Precision**

Motor RPM: 1 RPM

Volume Injection:  $\approx$  0.03 gpm (0.11 lpm)

### **Power Requirement**

230 VAC  $\pm$ 10%, 2.5A (820 VA) max

### **Controls**

Start / Stop Switch

Direction (Normal Sampling or Backflush) Switch

Speed and Volume Injection 10-turn Adjustment

### **Operating Temperatures**

Pump Hose: -20 to 100°C (-5 to 212°F)

Motor (Surface)<sup>1</sup>: -25 to 160°C (-13 to 320°F)

VFD Box: -10 to 55°C (-14 to 131°F)

### **Dimensions**

PFI System (w/o transport platform):

23"L x 25"W x 42 1/2"H (58.5 x 63.5 x 108 cm)<sup>2</sup>

VFD Box: 12"L x 9"W x 7 1/2"H

### **Weights**

PFI System: 89.5 lbs (40.6 kg)

Suction Filter: 13.5 lbs (6.1 kg)

VFD Box: 8 lbs (3.6 kg)

### **Approvals / Certification**

Motor: UL/CSA Class I, Zone 1 (Div 1), Group D,  
Class I, Group F & G, T3C

VFD Box: UL/ULC, CE IP 66

## Features

- PFI trap incorporates proven characteristics such as tripod agitator blade design with minimum clearance, internal baffles to increase agitation persistency, and submerged mud exit port to prevent gaseous contamination
- Hose material – reinforced EPDM<sup>3</sup> - specifically made to withstand high-temperature OBM/WBM<sup>4</sup> slurry with abrasive solids (e.g., fine cuttings), allows long unattended operation of cuttings filter tube
- Peristaltic type pump with r-EPDM allows extended dry-running of PFI to handle pumps-off (e.g., making connections) and other no return flow events
- Diagonal layout of cuttings filter screen maximizes mesh area for maximum service life between cleanouts
- Quick-connect reversible design allows rapid tool-less removal; with full bore construction, even cleaning without use of liquid (i.e., by shaking off tube) removes significant amount of cuttings
- Built-in soft ramp start-stop functions protect motor, gear connections and agitator blade from damaging high initial torque, achieving longest MTBF possible for a CVT system
- Reverse pumping direction with a simple flick of a switch for preliminary flushing of PFI trap and cuttings filter - further reduces the interruptions due to manual cleanouts



NOTES: **1** – Ambient heat exchange with motor body is the more dominant effect affecting this limit; agitation is minimal load to motor **2** – L x W footprint measurement includes hose connections operation-ready installation **3** – Ethylene Propylene Diene Monomer hose reinforced to improve resistance against hydrocarbon oils **4** – Oil and Water Based Mud