

OPTIFLOW

DATA SHEET

Description

This is a recent concept for liquid fuel systems offering unbeatable cost effectiveness for medium-sized gas turbine applications.

A metering pump is a high-pressure pump with a positive displacement characteristic which can be varied by a control mechanism to provide both pumping and throttle functionality in one unit. Because only the turbines' fuel flow requirements are delivered by the metering pump, there is no need for a recycle regulator as in the case of a conventional liquid fuel throttle valve system.

The HEINZMANN metering pump is based on an axial piston pump where the piston stroke is adjusted by means of a swash plate whose angle is controlled by a HEINZMANN positioning actuator. The pump delivery is approximately $C \times n \times \alpha$ where C is the pump size constant, n is the pump speed and α is the swash plate angle.

Simple systems are run at a fixed speed with electric motor drive and in these systems the pump delivery is directly proportional to swash plate angle irrespective of discharge pressure. It is possible to drive the pump mechanically from the auxiliary gearbox of a gas turbine where a more sophisticated controller can be used to compensate the delivery for pump speed changes. This type of system is very cost effective for black start applications.

Because the metering pump only delivers the fuel demanded by the turbine to meet the load, no recycling of fuel is required so that the pump consumes a minimum amount of power and therefore imparts no heat energy to the fuel supply. The pump therefore runs cool so maintaining the lubricity of the fuel which extends the wear life of the pump and fuel system.

HEINZMANN actuators used in metering pump systems are independently certified for application in hazardous areas to ATEX and CSA standards permitting their use in almost all turbine applications

Metering pumps are available in a large range of sizes to suit most medium-sized gas turbines.

Metering pumps are tolerant to typical contaminants present in liquid fuel supplies which might interfere with sensitive components in traditional fuel systems.



Features

Cost effective, replaces three parts with one

Electric or mechanical drive options

Suitable for black start of emergency generators

Suitable for low viscosity fuel

Accurate and responsive

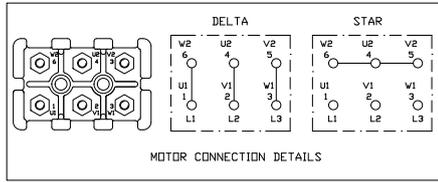
Technical data

Designation	OMPS-01-XY X= M (mechanical drive) or E (Electric motor drive) Y= Displacement in cc/revolution
Electronic controller	
Power supply voltage range	18 through 32 VDC
Power supply current range	< 1A (steady state) through 6 A (accelerating)
Environmental rating	IP00
Hazardous area certification	Safe area installation
Signal demand	4 ... 20 mA scaleable to heat (kW thermal), mass (kg/min) or volume (l/min) flow units
Position achieved feedback	4 ... 20 mA isolated equivalent to 0 ... 100 % actuator position
Final drive type	Four quadrant pulse width modulated
Servo actuator	
Maximum torque	3.75 Nm (StG 2040/68E) or 5.5 Nm (StG 2080/68E) or 13 Nm (StG 2120/68E) other sizes available to special order
Maximum power	4 J, 7 J, 15 J
Small signal bandwidth	8 Hz
10-90 % position transit time	0.3 s
Ambient temperature range	-20 ... 90 °C
Environmental rating	IP54
Position feedback accuracy (Elyson feedback)	Accuracy 5 % (measured at actuator shaft)
Field electrical connections	Solder pins in MIL standard connector on actuator
Hazardous area certification	ExN-Zone-2-ATEX or Division-2-CSA
Actuator to pump linkage	Rod and unequal length levers with spherical joints
Metering pump	
Type	Axial piston with displacement controlled by variable angle swash plate
Displacement	11.8, 14.1, 22.1, 33.8, 46.4, 76.5, 98.3, 130.2 cc/revolution
Porting	SAE female ports for suction, discharge and case drain
Pump control shaft	Plain shaft with cross drilling in neutral position
Pump characteristic	Positive displacement approximately linear to lever position at constant speed
Turbine application (distillate fuel)	1 ... 30 MW shaft power
Pump material	Hardened cast steel with special swashplate bearings
Suction pressure	0.8 ... 3.5 bar absolute at suction port
Discharge pressure	Up to 100 bar
Media viscosity range	27 ... 2000 SSU
Speed range	600 ... 1800 rpm at full working discharge pressure
Motor drive	
Type	3 phase induction, 50/60 Hz, 4, 6 or 8 poles
Hazardous area certification	Ex'd' or Ex'N' Zone 1 or 2 ATEX or equivalent CSA
Coupling	Spider, hard grade
Adapter	Certified bell housing direct to motor flange
Motor power (kW)	Approx. flow (lit/min) x pressure (bar)/380
Mechanical drive	
Maximum speed	1800 ... 3300 rpm (depending on pump size)
Pump drive	Splined or parallel keyed male shaft
Pump delivery compensation for speed	Special digital controller with speed measurement
Shaft power (kW)	Approx. flow (lit/min) x pressure (bar)/500
Direction of rotation	Clockwise or anti-clockwise (state when ordering)

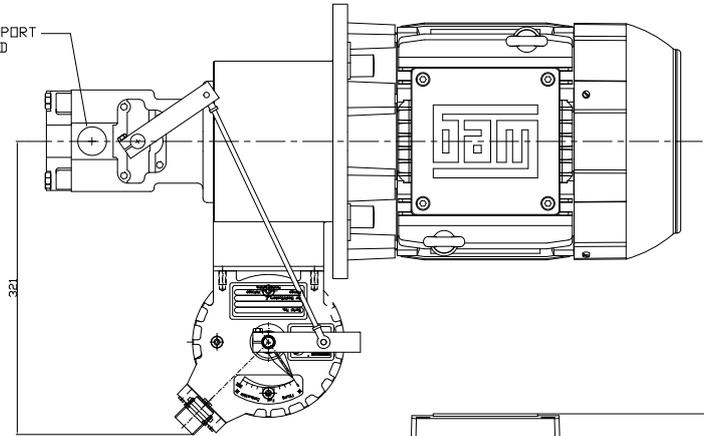
Applications

- Medium-sized gas turbines

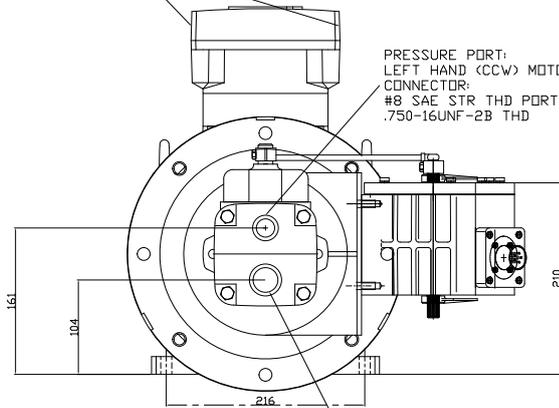
Dimensions



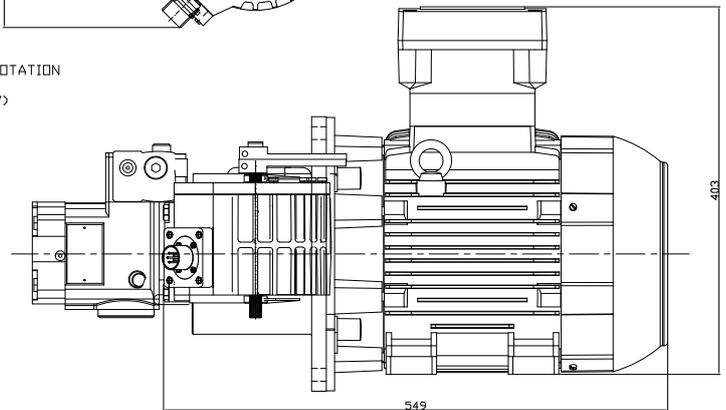
CASE DRAIN
#8 SAE STR THD PORT
.750-16UNF-2B THD



2 x M25 x 1.5
CABLE GLAND
ENTRIES



PRESSURE PORT:
LEFT HAND (CCW) MOTOR ROTATION
CONNECTOR:
#8 SAE STR THD PORT (CW)
.750-16UNF-2B THD



SUCTION PORT:
LEFT HAND (CCW) MOTOR ROTATION
CONNECTOR:
#12 SAE STR THD PORT (CW)
1.062-12UNF-2B THD

