Level Controller (Internal Ball Float)

(With On-Off Pneumatic Output) Model 401-2, Russian Design/Fisher Design
(Similar to M/s. Fisher U.S.A., Model No. 231C-779K)

Introduction

Internal Ball Float Level Controller has been designed and developed especially for various types of liquid level control service used in Refineries, Gasoline Plants, Industrial Plants, Oil and Gas Separators and other similar installations. This unit is installed directly to the flanged opening on the side of the vacuum towers, soaking drums, oil and gas separators, fractionating columns, all type of liquid containers where a float operating inside of the tower can be used to an advantage. These units with floats operating inside the main level container are not recommended where turbulence or foaming on the liquid surface occurs. For such installation, the external float cage type Level Controller is recommended. Refer Bulletin 1200 for details of Displacement Type Level Controller (Pneumatic)

Operation

The operation of the Level Controller is based on the principle that Ball float position is determined by the Fluid Level variations actuating the rod through a system of levers. This controller operates on Archimedes Principle. The increase in level causes float to move up which is helped by counterweight for upward movement. The linkage operates plunger of pneumatic relay for changing output pressure which finally operates control valve to control level of liquid. The maximum angle of the plug turn is 50° and corresponds to the level change within the range of 300mm. The pneumatic relay is supplied with purified natural gas or air at a pressure of 1.1 to 2.5 Kg./Cm².

Construction

Ball Float, Float rod, Shaft, Coller & Gland housing are made of Stainless Stell. Pneumatic Relay is of Brass which is weather proof enabling the instrument suitable for outdoor and moist atmosphere.

Technical Specifications

Service	Crude Oil (Oil/Gas interface)
Operating Pressure	Upto 40 Kg./Cm²
Operating Temp.	120°C

Specific Gravity	0.7 (Minimum)
Float	304 SS
Float Size (±5mm)	(A) 7½ inches Ø (197 mm) (B) 9½ inches Ø (248 mm)
Mounting	Side Internal
Flange Details	a) 8" x 150 ASA (b) 10" x 150 ASA c) 2" BSP Threads
Flange Material	Carbon Steel
Supply	1.1 kg/cm² to 2.5 kg/cm² (Clean, dry & oil free air or gas)
Output	ON-OFF (Proportional)
Action	**Direct** (Increase in level increases output) **Reverse** (Increase in level decreases output)
Float Travel Stopper	Provided
Float Stem	606 mm Std. (others on request)
Packing	Teflon
Float Travel	300 mm
Plug Turn Angle	50°
Pneumatic Connection	1/4" NPT

Shut off Valve, Relief Valve & Angle Valve

Shut off Valve Model 1100-1

(Similar to M/s. Invalco / Natco, Model No. RDSG-101-503

Technical Specifications

Body Material	C.S
End Connection	Threaded
Body Cover/Lower Dia. Case	C.S
Diaphragm Operator	Upper Dia. Cast Aluminum with Buna-N Diaphragm
Packing	Standard O Ring-Buna-N
Maximum Working Pressure	8kg/cm2
Temperature Limits	- 10 to +100°C
Stem Material.	304 SS.
End Connection Size	3/4" NPT and 1" NPT
Trim.	S.S. Throttling Teflon insert
Cv	6 for 3/4" orifice 12 for 1" orifice

(SHUT OFF VALVE)

Releif Valve Model 1100-3

(Similar to M/s. Invalco / Natco Model No. RDSG-301-503

Body	Cast Iron/C.S.
Diaphragm Case	Pressed Steel
Containment Pressure	10 kg/cm²
End Connection Size	2" & 3" Threaded
Diaphragm	Nylon Re-inforced Buna-N
Temperature Limits	- 10° to+100°C
Internal Trim	304 Stainless with moulded Buna Plug 1½" Orifice
Flow Capacity	Cv -27 (All Models)

PRESSURE INCREASE REQUIRED FROM FULL CLOSED TO FULL OPEN.

Spring Range, Kg/cm²	Increase
0 -1.5	0.2 Kg/cm²
1.25 - 2.75	0.3 Kg/cm²
2.75 - 4.00	0.6 Kg/cm²
4.00 - 6.00	0.7 Kg/cm²

(RELEIF VALVE)

(ANGLE VALVE)

Settings

Any spring combination may be set to open at less than 5 psi WP, but, because the heavier springs are less sensitive, it is recommended that valves be selected to suit the pressure range required. The valve will be set at pressure required and a seal wire inserted.

Installation and operation

Valve is installed in the line so that flow pressure is exerted against the bottom of the plug. Line pressure is exerted against the diaphragm through the hollow stem connecting the diaphragm to the plug. When flow pressure exceeds the spring setting pressure, valve opens and allows excess pressure to relief through the orifice of the valve and down the flow line. As pressure is relived, spring pressure returns the plug against the seat for positive seal.