

Smart Rotary Multiport Selector Valve (RMSV) Revolver™ with LeakSen™ Leak Detection System



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Oil & Gas Measurement Limited's Smart RMSV Revolver™ is a rotary multiport selector valve complete with LeakSen™ leak detection system. This makes it an ideal valve for use within intelligent group metering systems (I-GMS) for flow rate monitoring using multiphase meters in oil and gas fields. Our Smart RMSV Revolver™ is the first rotary multiport selector valve with remote leak detection system designed for connection with zero leakage.

Some of the advantages of the Smart RMSV Revolver™ when compared with other manufacturers include:

- Unique operating principle
- Complete autonomy and remote control of Smart RMSV Revolver™ parameters
- Ensures the zero leakage connection of each well to the measuring line
- Maintain seal at high differential pressure and flowrate of connected wells
- Easy to install, operate and minimum maintenance costs

Objectives and implemented solutions in Smart RMSV Revolver™

The design of the Smart RMSV Revolver™ addresses some fundamental objectives of group metering systems to measure well flowrates.

Objective 1 - To ensure the meter accuracy of well-production rate measurement

Due to leakage line inside multiport selector valves, arising from:

- Presence of mechanical impurities in the operation environment
- Wear or damage of the multiport selector valve seals

Part of the well flow to the group outlet line (measuring line) can be lost thereby causing inaccurate metering.

It is impossible to diagnose the presence of internal leaks from the measuring line to the group outlet in other multiport selector valves currently available, or to estimate the unaccounted flow of the produced liquid and gas. As a result, the accuracy of the readings of the group flow rate measuring system cannot be guaranteed.

Solution

LeakSen™ leak detection system monitors the robustness of the connection between the well and the measuring line at any time and sends a report to the operator desk. Consequently, the operator can be sure that the well parameters are measured without loss.

Objective 2 - To ensure maximum autonomy and reliability of a group measuring system

Group measuring systems are usually operated in difficult to access areas with poorly developed infrastructure, which leads to significant maintenance costs.

Solution

Revolver™ multiport selector valve is equipped with a built-in self-diagnosis system that enables operators to:

- monitor the parameters of the Revolver™ multiport selector valve and operability of the seals in automatic mode
- to immediately eliminate the leakage caused by the ingress of mechanical impurities into the working area by triggering the flush algorithm;
- to provide information to the operator about the valve parameters with a detailed description of the detected problems, if they cannot be eliminated independently. The operator can then determine the amount of repair works and send service personnel to the facility for their implementation as required

This allows identification and elimination of failures at an early stage, preventing further damage that will require a major repair of the valve.

Objective 3 - To reduce labour and maintenance costs

Traditional multiport selector valves are not usually repairable at the site since by the time the faults are detected severe damage has already been caused to the valve. Therefore to refurbish the multiport selector valve, it is necessary to take it out of operation, transport the valve for repair to a specialist workshop and then repeat the above operations in reverse order. If the multiport valve is part of an intelligent group measurement system then these actions mean that this complete package is out of use.

Solution

A single service engineer using standard tools can carry out all maintenance and routine repair works on the Revolver™ multiport selector valve in the field. The replacement of the main multiport selector valve seals through the special service port takes 2-3 minutes. Total shutdown time of Revolver™ multiport selector valve for draining, seals replacing and performing filling-up operations does not exceed 20 to 30 minutes.

Objective 4 - To increase the number of wells connected to one group measuring unit

Solution

The LeakSen™ controller can operate an unlimited number of Revolver™ multiport selector valves, which means that an unlimited number of wells can be connected to one group measuring unit.

Scope of Supply

Scope of supply for Smart Revolver™ Multiport Selector Valve with LeakSen™ leak detection system includes the following:

- Revolver™ multiport selector valve
- Leaksen™ controller
- Electrohydraulic actuator

Benefits

- Fewer valves
- Lower piping costs
- Lower automation costs
- Lower installation costs
- Lower maintenance costs
- Lower skid weight
- Smaller skid



Available Sizes and Configurations

Standard size	2" x 4"	3" x 6"	4" x 8"
Inlet port	50 mm (2")	75 mm (3")	100 mm (4")
Operating pressure	10 MPa (ANSI 600), 25 MPa (ANSI 1500)		
Number of inlet ports	7 + 1 service	7 + 1 service	7 + 1 service
Test port	50 mm (2")	75 mm (3")	100 mm (4")
Group outlet port	100 mm (4")	150 mm (6")	200 mm (8")
Ambient temperature	From -45°C to +40°C		
Inlet/outlet port connection type	Flanged / welded		

Compliance with Technical Regulation of Customs Union 010/2011 is proved by EAEU Declaration No. RU D-GB.AT15.B.01884.

Compliance with Technical Regulation of Customs Union 032/2013 is proved by EAEU Declaration No. RU D-GB.AT15.B.01885 and by Certificate of Customs Union RU C-GB.AT15.B.00902.

H₂S trim in compliance with NACE MR 0175 / ISO 15156, GOST 53678-2009 and GOST 53679-2009.



Oil & Gas Measurement Limited

Specifications

RV								MODEL	
	2	2"/DN55 X 4"/DN100						SIZE	
	3	3"/DN75 X 6"/DN150							
	4	4"/DN100 X 8"/DN							
	A	150#						END CONNECTION	
		B	300#						
		C	600#						
		D	900#						
		E	1500#						
	RF	RAISED FACE						TYPE	
		RJ	RING JOINT						
	T1			BODY	FLANGES	INTERNALS		MATERIALS OF CONSTRUCTION	
		T1		Carbon Steel ASTM A105	Carbon Steel ASTM A105	Carbon Steel/DUPLEX			
		L1		LTCarbon Steel ASTM A350 LF2	LTCarbon Steel ASTM A350 LF2	Carbon Steel/DUPLEX			
		S1		STAINLESS STEEL 316L or EQUAL	STAINLESS STEEL 316L or EQUAL	Stainless Steel/DUPLEX			
		O		AS SPECIFIED	AS SPECIFIED	AS SPECIFIED			
RV	2	C	RF	T1	PRODUCT CODE EXAMPLE				

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