



Course on:

Control Valves & Actuators

2nd – 4th December, 2020

205th in Series

FLUID CONTROL RESEARCH INSTITUTE

(Under Ministry of Heavy Industries & Public Enterprises, Govt. of India)

Kanjikode West, Palakkad-678623, Kerala, India

Telephone: 0491-2566206, 2566120, Fax: 0491-2566326

Email: training@fcriindia.com

Website: www.fcriindia.com



FCRI, a state of the art Flow and Fluid Engineering Institute, first of its kind in South East Asia is dedicated to Research & Development in Fluid Flow Measurement & Control Techniques. More than 85 sponsored projects for various reputed organisations have been successfully completed by the institute. The Institute provides facilities towards technological developments to the flow product industries and serves as a National Certifying Authority and Quality / Reliability evaluation facility. The Institute also provides facility for calibration of metrological, pressure, temperature, electrical parameters, noise, vibration etc. for ISO certification. Apart from testing and calibration, the Institute conducts National and International training programmes in the field of flow control, Measurement & Instrumentation, Metrology, Pressure and Temperature measurement / Calibration and related areas.

Major Calibration & Test Facilities at FCRI

Laboratory Fluid flow NABL C026/T027		Maximum Flow Rate (m ³ /h)	Maximum Line Size	Uncertainty in Flow Rate (% reading)	Uncertainty in Volume (% reading)			
Water Flow		4500 15000	900mm 2000mm	Upto 200m ³ /h : ±0.05% 200 to 2500m ³ /h : ±0.10% 2500 to 4500 m ³ /h : ±0.15% 5000-15000m ³ /h : ±0.5%	2m ³ -20m ³ : ± 0.05%			
Air Flow At Ambient conditions		10000	400mm	0.016 m ³ /hr to 0.25m ³ /hr : ±0.3% 0.25 m ³ /hr to 40m ³ /hr : ±0.1% 0.7 m ³ /hr to 400m ³ /hr : ±0.15% > 400m ³ /hr 10000m ³ /hr : ±0.25%	0-0.5 m ³ : ±0.1% 2 m ³ : ±0.1%			
Closed loop Air Test Facility (20 Bar) *Calibration Loop *Gravimetric Loop Velocity		10- 400m ³ /h 4-1000kg/h	150mm 50mm	± 0.3% ± 0.1%				
Oil Flow		650	250mm	0-100m ³ /hr : ± 0.05% 100-600m ³ /hr : ± 0.075%	Upto 1.8m ³ : ± 0.03% 1.8m ³ to 9 m ³ : ± 0.04%			
Compressed Natural Gas		4500 Kg/hr	1.5"	± 0.1%*	*under-Accreditation			
Mechanical Calibration Metrological, Pressure, Noise, Vibration etc. NABL C 056	Parameters		Range	Calibration & Measurement Capability	Parameters	Range	Calibration & Measurement Capability	
	MASS-Standards Weights		1mg and upto 500kg	0.0048 mg to 1.2g	PRESSURE pressure transducers	1 to 60bar 60 – 1200bar	0.04% of rdg 0.026% of rdg	
	MASS-Weighing Balance & Mass Comparator		Various ranges from 0-2 g to 600 Kg	0.005mg to 0.05 Kg	Pressure-gauge pressure transducers (pneumatic)	30mbr to 2000 mbar abs	0.02% of rdg	
			600 Kg to 2000 Kg	0.1 Kg		0.25 bar to 20 bar abs	0.038% of rdg	
			2000 Kg to 20000Kg	3.53 Kg				
	VOLUME -Specific Gravity bottle, Pipettes, Burettes Measuring Flasks		1 ml – 5000 ml	0.05ml to 0.7ml	Pressure-Low pressure gauge & differential	0.2 mbar to 10 mbar 10mbar to 160mbar	0.88% rdg ± 0.077%of rdg	
	DENSITY - Hydrometers		0.64 g/cc – 1.98 g/cc	±0.0005 g/ml	Pressure-gauge pressure transducer (pneumatic)	30 mbar to 2000 mbar	± 0.02% of rdg	
	VISCOSITY		Dynamic	1to 60000 mPas/cSt	± - 1.0% rdg	Pressure-vacuum (gauge)	-100 to 980mbar g	± 0.06 of rdg
			Kinematic	1to 60000 cSt	± - 1.0% rdg	LENGTH- slip Gauges (steel)	0.5 – 100 mm	0.05 µm to 0.16µm
	Acoustic Pressure – Free Field		125 Hz to 20 Hz	≤0.5 dB	Vibration Test Facility	6000 Kgf / 2000Kgf shaker 5 Hz to 2000 Hz		
	Acoustic Pressure – Pressure Field		94 & 114 dB @ 1 kHz 124 dB @ 250 Hz	0.5dB	Acoustic Test Facility	Hemi Anechoic Chamber ISO3745		
	Acoustic Power		125Hz to 16 kHz	2.0dB				
	Vibration Amplitude - Analyzer		0.1 to 15g (acceleration) 1 to 240mm/s(velocity) 0.01 to 10mm(displacement)	2.4 %	Temperature & RH Test Facility	-70 to 180 deg C 10 to 98 % RH		
	Vibration Amplitude –Sensor Linearity		2Hz to 15 kHz Upto 30g pk	≤2.5 % 1.25%			Dust – IP 5X, 6X	
	Speed (Contact)		100 to 10000 rpm	1.6 rpm	* IP Tests			
Speed (Non-contact)		60 to 100000 rpm	≤2.4 rpm	Water – IP X3 to X8				
Electro Technical Calibration Electro Technical Calibration NABL C 0254		±100µV to ±1000 V ±0.1mV to ±1000V 1mV to 1000V 100mV to 1000V	0.60% to 0.001% 0.12% to 0.012% 0.4% to 0.014% 0.04% to 0.03%	DC Current Source Measure AC Current Source Measure	±100µA to ±1000A ±100µA to ±20A 100µA to 700A 100µA to 10A	0.014% to 2.0% 0.013% to 0.05% 0.04% to 1% 0.06% to 0.035%		
		Resistance Source Measure	10µΩ 10G Ω 100µΩ 1G Ω	0.6% to 0.02% 0.42% to 0.5%				
		Time	1 Sec – 5400 sec	1.53 µSec to 5.4mSec	Frequency	1 Hz to 1 GHz	10µmHz to 1.2 Hz	
Thermal Calibrati on NABL C 0255		Temperature	-70 °C to +1200 °C	±0.07°C to 1.3°C				
		*Temperature & Humidity Chamber	- 70°C to 180°C 10% to 95% RH		Fixed Point Cells	-38.8344°C to 961.78°C	2.9m°C to 19.7m°C	

About the Programme

The control valve plays a vital role in automatic control of modern plants, which depends on the correct distribution and control of flowing liquids or gases. The modern processing plant contains hundreds, and often thousands of valves are complementary activities, each influencing the other, sometimes strongly sometimes subtly. Proper selection of control system elements plays an important role in proper functioning of process plants. Flow being a major parameter in any process, the selection of control valves to suit the application is very important. Valves are one of the element causing fugitive emission in a process plant. As the population of valves in a plant is high, cumulative effect of them is quite significant. Present course covers matching of valve / actuator technical specifications and system operational parameters. The course presents a practical approach to selection, sizing and installation and performance evaluation of control valves/actuators. Present course also covers in brief of fugitive emission, life cycle testing, special tests for nuclear power industry etc.

Topics Covered

- Basic classification of valves and their characteristics
- Basics of selection and sizing of control valves and matching actuator, meeting system, operational requirements etc.
- Air Valves , Safety Relief Valves and Breather cum Relief Valves Test Procedures
- Cavitation in valves – Theory and Testing
- Valves for cryogenic services – Test Program
- Fugitive emission (Theory and testing) on Valves
- Endurance test of valves and actuators – Life estimation
- Valves for nuclear applications
- Noise levels from control valves
- Valves for power reactor
- Seismic Qualification of Valves
- Diagnostics for valve actuators

Lab Experiments / Demonstrations

- Flow Coefficient test of Valves
- Seismic testing of Valves
- Fugitive emission testing of Valves
- Special tests on Valves

The Fees includes registration fee, course materials, participation certificate, group photo, and lunch & refreshments during the course days). FCRI is exempted from payment of income tax.

This course is purely Non-Residential. Assistance can be provided for booking accommodation in hotels in and around Palakkad, Kerala.

Fees

For Participants working in India:

Rs. 15,435/- + 18% GST Rs.2,778/-

Total Rs. 18,213/- per participant.+1% KFC 154/- (as applicable)

For Participants from abroad:

US \$ 908/- + 18% GST US \$ 163/- + Charge US\$ 20/- = Total US \$ 1,091/- per Participant.+1% KFC US \$ 9 .

We accept e-payment only

Bank Details : State Bank of India(SME Branch) Kanjikode west, Palakkad - 678 623

Account Name : Fluid Control Research Institute

Account No. : 10258760349 & IFSC Code : SBIN0006640

Please email GST identification number , invoice address and e-payment details to training@fcriindia.com

Target Group

Personnel who are involved in design, selection, installation or operation of valves and actuators within the Oil & Gas, Petroleum, Water, Chemical Process, Pharmaceuticals, Plastics, Paper and Food Industries. A basic understanding of flow measurement / Control requirements & applications would be advantageous.



***10%
Discounts for
nominating 5
or more
participants
from same
organisation**

RECOGNITION OF FCRI



Agency	Category
National Accreditation Board for Testing and Calibration Laboratories (NABL)	Calibration/Testing of Flow Products, Mechanical Measurements Thermal Calibration, Electro Technical Calibration
Netherlands Measurement Institute (NMI)	CLATF (20 Bar, 400 m ³ /h) of FCRI complies with the criteria for Calibration Laboratories as per ISO/IEC 17025
Department of Science & Technology	Recognized R&D Institute
Department of Weights & Measures (Ministry of Civil Supplies)	Model Approval tests on flowmeter for custody transfer of oil/gas as per OIML Standard
Chief Controller of Explosives, Nagpur	Testing of Safety Relief Valves
Bureau of Indian Standards	Testing of Water Meters, Anemometers etc.
Institution of Fire Engineers, New Delhi	Hydraulic Qualification tests on fire fighting equipments
Central Pollution Control Board	Certification of Petrol, Kerosene & Diesel Generators for type approval
Nuclear Power Corporation	Seismic Studies for Power plant Equipments
Ministry of External Affairs (ITEC) & Ministry of Finance, Dept. of Economic Affairs (Colombo Plan)	Training programmes for Foreign Nationals on Flow Measurement and Instrumentation for Oil Gas & Water utilities/industries
GCAS Quality Certification Pvt. Ltd	ISO 9001:2000 Certification in Calibration & testing of fluid flow component, calibration of mechanical, electro technical, thermal instruments, flow calibration & measurements at site, project consultancy & implementation, professional training.

NABL Approved Test Facilities

Isolation and Control Valves/Actuators	Cv, FL, Seat leakage test, Fugitive emission, cryogenic testing, torque
Water Meters	All test as per IS6784, IS779, IS2373, ISO4064
Butterfly Valves & Actuators	POD tests as per AWWA C504 & C540
Venting devices/air valves	API 2000
Safety Relief Valves	ASME PTC 25
Gas Turbine Meters	OIMLR137-1 Model Approval
Gas Regulators	BS EN 334
Diaphragm Gas meters	BS EN 1359 Model Approval
Liquid Flow Meters	As per relevant standards

Other Tests

Life Cycle Tests & Cavitation Tests for valves
Proof of Design Tests
Life cycle and performance tests for air release / Non return / Safety relief valves



For further information & Registration, please contact:

Head Training,
Fluid Control Research Institute
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Registration

Registration for the training program can be confirmed by sending the details: Name, Designation, Organisation, Postal Address Email/Phone/Fax/Post to the address given below. The course fee is to be remitted in advance through crossed Demand Draft favouring "Fluid Control Research Institute", payable at Palakkad. The registration must be completed on or before 1st December 2020.