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फ्लूइड कंट्रोल रिसर्च इंस्टिट्यूट, पालक्काड

FLUID CONTROL RESEARCH INSTITUTE, PALAKKAD

An ISO 17025 : 2017, 9001 : 2015 Establishment

An Autonomous R&D Organisation under Ministry of Heavy Industries, Govt. of India.

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एफ.सी.आर.आई.

FCRI

CERTIFICATE OF TESTING

ON ONE EXPLOSION RELIEF VALVE
Of Size 3" NB From
M/s.AGNI RAKSHAK PRIVATE LIMITED
9/901,9,SHUBHARAMBH TOWERS CHSL,
Chittalsar,Manpada, MAHARASHTRA-400607

TC-7402

Water Flow Laboratory

Date of Receipt	Date of Testing	Date of issue
19.12.2022	19.12.2022	30.12.2022

ULR - TC7402224000001 47F

REPORT NUMBER : FCRI/WFL/T/2022/147

JC -2022-1975

Approved Signatory

K. SURESH
CHIEF RESEARCH ENGINEER

SUMMARY

Test Valve	Explosion Relief Valve
Standards Referred	ANSI/ISA 75.02.01-2008 : "Control Valve Capacity Test Procedure"
Laboratory	Water Flow Laboratory (WFL)
Test Results	The results of Test is given in Table 1, the Valve Characteristic is given in Fig. 2 and summary of result in Section 2.
Traceability	All the instruments /Reference flow meters used are traceable to national standards through reference standards and their calibrations are valid.

Tested by	Prepared by	Checked by
1. K.G.Jayesh	Kiran P	K.G.Jayesh. R.E
2. Vishnu M		

1. Method of Testing

The valve was installed in the test line as shown in the schematic of test setup. The line was flooded and entrapped air is cleared using circuit air bleeds. The valve was set at the fully open position. The downstream control valve was set to give the desired pressure differential across the test valve, which was measured using high precision differential pressure transmitters. When flow conditions had stabilised, the flow rate was measured using the reference flow meter.

The differential pressure across the valve was adjusted to the next desired value by controlling the downstream valve and the procedure was repeated for each flow rates. Temperature of water was noted during each test using on-line RTD. The line pressure was measured using a precision pressure gauge and density of water was obtained from an on-line Densitometer.

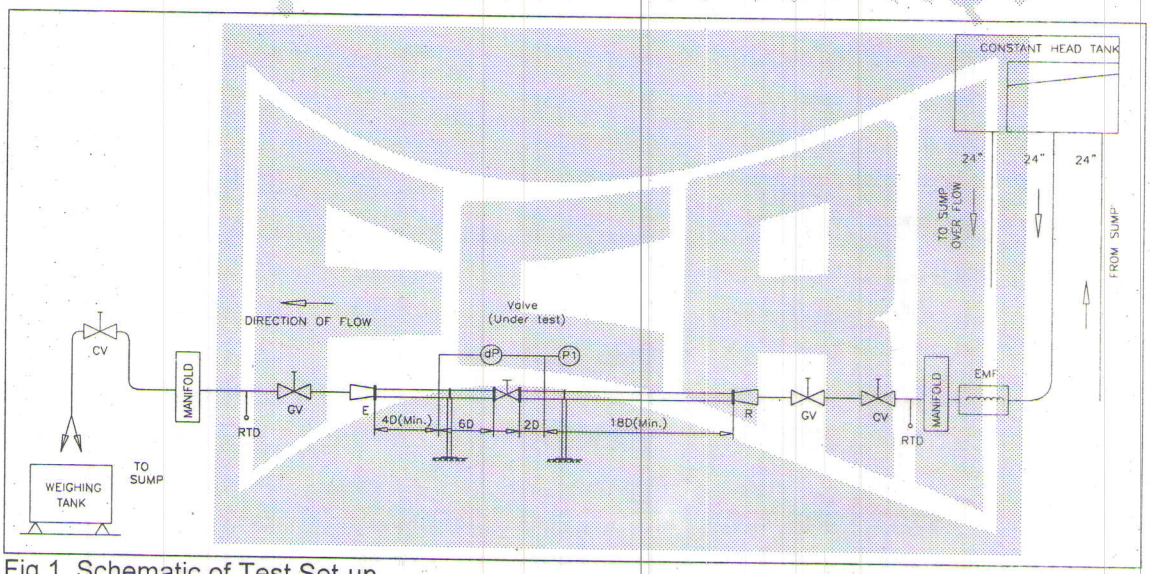

Fig 1. Schematic of Test Set-up

2. Result

1) Test results are presented in Table 1 and Valve characteristic curve is plotted in fig. 2.
2) The expanded uncertainty in the determination of Cv is estimated to be better than 0.25 %.The reported expanded uncertainty is stated as the uncertainty in measurement multiplied by the coverage factor k = 2, which for a normal distribution corresponds to a coverage probability of approximately 95.45 %.

Checked

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CC-2395

CERTIFICATE OF CALIBRATION

ULR-TC740222400000147F

Specification of the Device Under Test

FLOW ELEMENT : **EXPLOSION RELIEF VALVE ASSEMBLY**
SIZE : 3 inch
MAKE : AGNI RAKSHAK
SERIAL NO. : E3PT-A01
DATE OF TESTING : 20.12.2022

Table 1

Sl. no	Pup bar	T deg C	ρ kg/m^3	dP bar	Qa m^3/hr.	Qa lpm
1	1.59	29.46	995.740	0.051720	27.650	460.833
2	1.59	29.46	995.740	0.051570	27.630	460.500
3	1.59	29.48	995.740	0.051770	27.650	460.833
4	1.59	29.48	995.740	0.089340	36.270	604.500
5	1.59	29.48	995.740	0.089680	36.280	604.667
6	1.60	29.46	995.730	0.089660	36.270	604.500
7	1.60	29.460	995.730	0.208070	54.980	916.333
8	1.60	29.500	995.730	0.208780	54.990	916.500
9	1.60	29.500	995.730	0.207400	54.930	915.500
10	1.61	29.510	995.730	0.359120	72.450	1207.500
11	1.61	29.510	995.730	0.359320	72.460	1207.667
12	1.61	29.510	995.730	0.359810	72.470	1207.833
13	1.61	29.520	995.720	0.568600	90.750	1512.500
14	1.61	29.520	995.720	0.562260	90.730	1512.167
15	1.61	29.520	995.720	0.563830	90.680	1511.333
16	1.62	29.56	995.710	0.673170	98.930	1648.833
17	1.62	29.56	995.710	0.673240	98.900	1648.333
18	1.62	29.56	995.710	0.674090	98.990	1649.833

P_{up} - Pressure at the upstream of the test valve.
T - Temperature of water.
ρ - Density of water at line temperature.
dP - Differential pressure across the test valve.
Qa - Actual Flow rate.
V - Velocity
K - Valve hydraulic resistance coeft

$$= \frac{2 \times dP}{\rho \times V^2}$$

Checked

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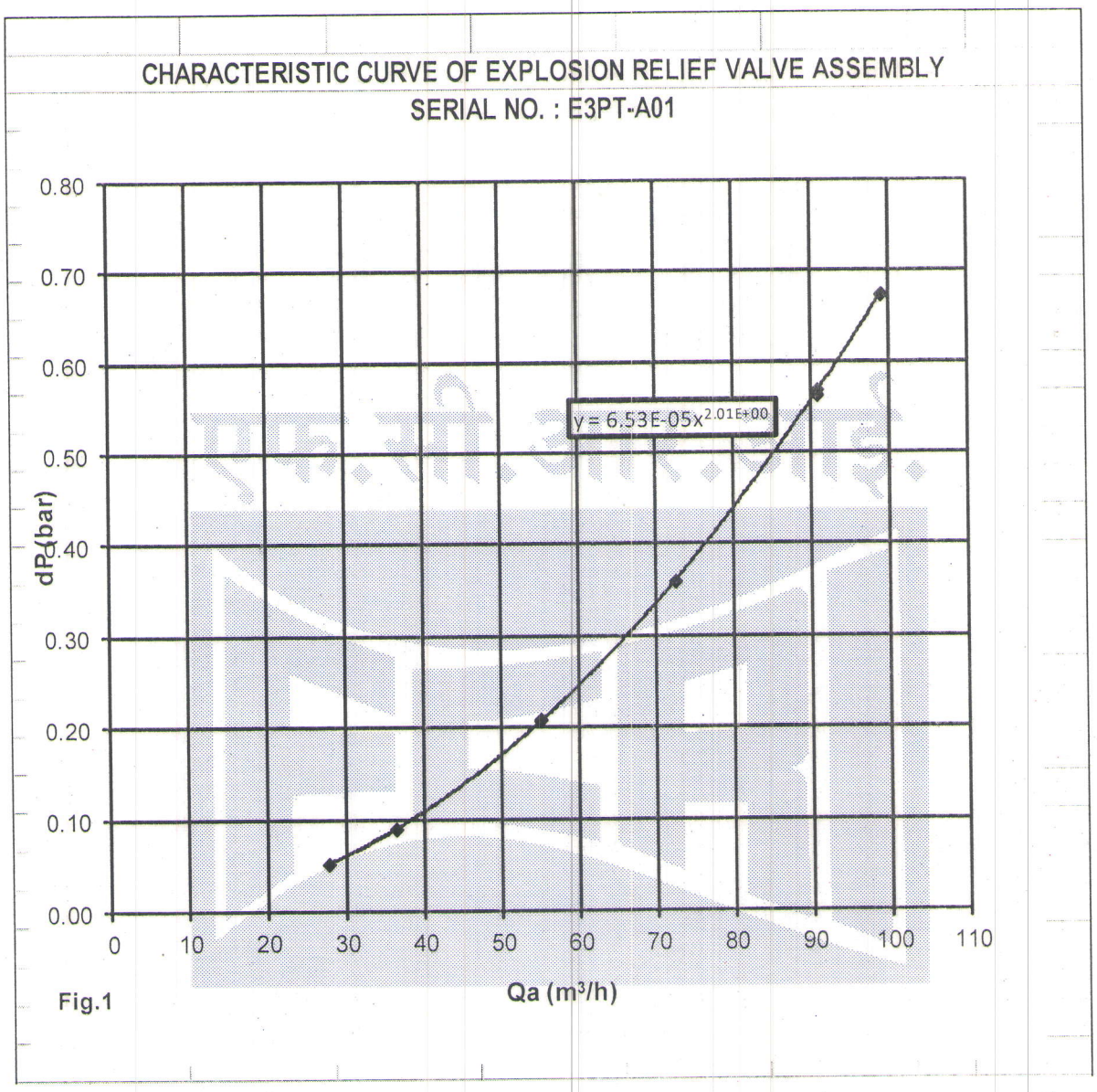

Fig.1

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