SERIES

730

MASS FLOW CONTROL VALVES

CERTIFIED ISO 9001 QUALITY

KURZ INSTRUMENTS INC.™

SERIES 730 MASS FLOW CONTROL VALVES

DESCRIPTION

The Series 730 combines an electric drive motor, the valve body, variable area flow orifices and limit switches into a well-designed, integrated package. The flow coefficient (C_V) is nearly linear due to its nearly 300˚ rotation between close and open. The typical turn-down ratio is 50:1, largely due to the incorporation of a pressure-assisted disk which becomes active near the shut-off position. The C_V range is from 0.05 to 10.0 (fully open) in three convenient body sizes. The Series 730 is constructed of 316L Stainless Steel, with Viton O'rings and an O'ring sealed motor cover. It operates as a two-wire loop-powered device and is powered and controlled by one of the Series 155 Mass Flow Computers and used with a Kurz In-Line Mass Flow Element. The inlet and outlet fittings are Schedule 40 pipe with MNPT end connections or Class 150 flanges. Because of its rotary design, the Series 730 is not as affected by abrupt line pressure changes as pneumatic control valves. When precise, reliable mass flow control over a wide flow range is required, Kurz mass flow control systems are the best.

PRINCIPLE OF OPERATION

The Series 730 Mass Flow Control Valves were designed by Dr. Jerry Kurz to provide a simple, compact, electrically operated precise metering valve for applications requiring a high flow rate turn-down ratio matching the high turn-down ratio of Kurz Thermal Mass Flow Elements. The unique Kurz design utilizes a rotor having a helical shape machined into its bottom face, opposite an inlet orifice and an outlet orifice. The diameter, separation and the helical depth of the helix were developed to provide a nearly linear flow coefficient (C_V) with angular rotation. A simple high torque gear motor (24 VAC) was selected for cost and simplicity. Since the Series 730 is a "fail-as-is" design, the motor is only used when changes are required, which greatly extends the motor life.

APPLICATIONS

- State-of-the-Art Air Sampling Systems
- Chlorine Metering
- Petrochemical Plants
- Semi-Conductor Process
- Gas Blending
- Control of Argon and Helium in Welding
- Pilot Plants

KEY FEATURES

- Rugged Integrated Design
- 2-Wire Loop-Powered
- 316L SS Construction
- High Repeatability (±.25%)
- Pressure Rating: 150 psig
- Temperature Rating: -40˚C to +25˚C
- Standard Open-to-Close Time of 20 Seconds (Faster is optional)
- Meets Nuclear Requirements for Seismic and Environmental
- High Turn-Down Ratio: 50:1
- Built-In, Pressure Assisted Shut-Off

TECHNICAL DESCRIPTION

The valve main body and rotor are machined from 316L SS bar stock. The rotor is machined and ground to a precise dimension to minimize the clearance between the orifices and the shut-off surface of the rotor. Precision ball bearings (two) are used to rigidly mount the rotor. The shut-off disk is precisely machined and sets into a c'bore in the face of the rotor. A small hole communicates between the top of the disk and the high pressure side of the valve to provide a pressure assisted shut-off at closing. An O'ring is used to seal the rotor from the flow. The pressure assisted shut-off disk is primarily designed to provide a high turn-down ratio and should not be used as a safety shut-off valve. The motor cover is also made of 316L SS and has an O'ring seal.

A small aluminum junction box is provided to make the 2-wire hook-up. Micro-Switches are located at the shut-off and wide open positions.

The Series 730 Control Valves have unexcelled performance as verified by their use in Nuclear Power Plants and their successful seismic and environmental qualifications. The 730 valves are powered and controlled with the Series 155 Mass Flow Computer.

OUR MISSION

To manufacture and market the best thermal mass flow meters available and to support our customers in their efforts to improve their business.

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SPECIFICATIONS

Process Temperature Rating: -40°C to 125°C

Process Pressure Rating: 150 PSIG

Materials: Flow body, flanges, rotor, cover and all other welded metal parts are 316L Stainless Steel.

Rotor O'ring: Viton, Kalrez

Shut-off Disk: Kel-F

Junction Box: Aluminum

Repeatability: 0.25%

Closed to Open Time: 20 seconds

Input Power: 24VDC, 250 mA max. Supplied by Kurz Series 155 Mass Flow Computer.

Field Wiring: One pair of twisted shielded wire, maximum loop resistance of 4 Ohms.

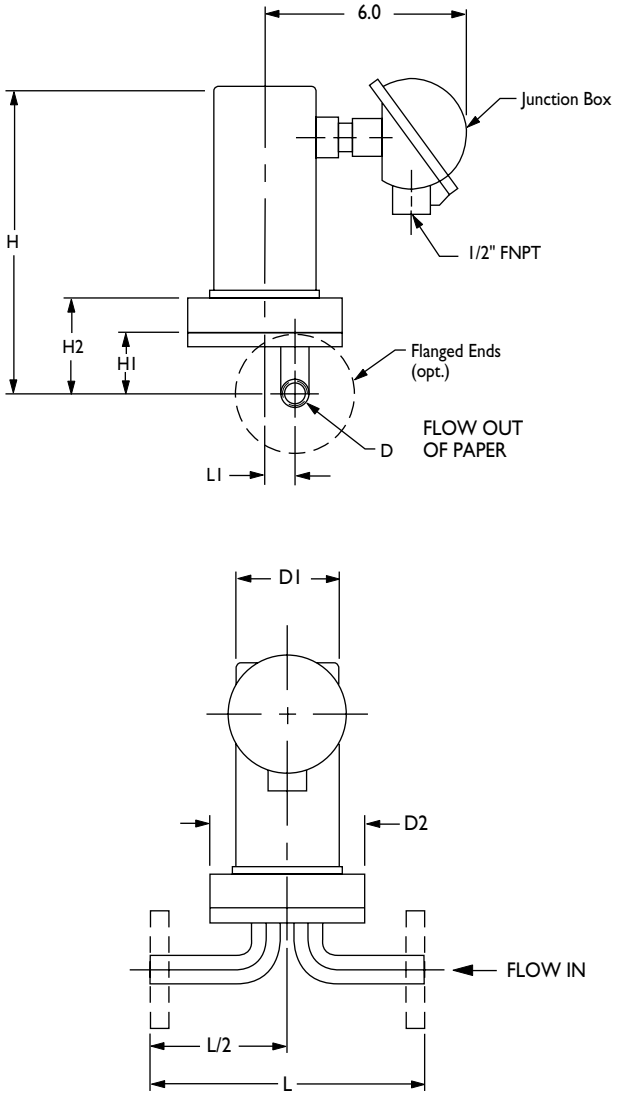
Electrical Enclosure: Equivalent to NEMA 4

Allowable Gases: Non-hazardous, non-corrosive

Process Connections: Male pipe thread or ANSI B16.5 flanges

Environment: -40°C to 60°C, non-condensing, non-hazardous locations.

SERIES 730 OUTLINE DRAWINGS



SERIES 730 MASS FLOW CONTROL VALVE DIMENSIONS

										Net Wt. Lbs.	
Model Number	*D*	*D1*	*D2*	*H*	*H1*	*H2*	*L*	*L1*	*Flange Size*	*Threaded*	*Flanged*
731-050 thru 731-1500	.840	3.00	4.50	9.25	1.84	2.84	8.00	.88	1/2" Class 150	15.0	17.0
732-2000 thru 732-5000	1.050	3.00	5.50	10.00	1.75	2.75	8.75	1.19	3/4" Class 150	21.0	25.0
733-7500 thru 733-10,000	1.315	3.00	7.25	10.00	2.00	3.13	12.00	1.56	1" Class 150	30.0	34.0

ORDERING INFORMATION

SERIES 730 MODELS			
Model Number	*Parent Number*	*Gas Flow Coef. (Cv)*	*Sch. 40 Pipe Size & Length*
731-050	75771211	0.050	½" MNPT x 8.00
731-100	75771213	0.100	½" MNPT x 8.00
731-175	75771215	0.175	½" MNPT x 8.00
731-250	75771216	0.250	½" MNPT x 8.00
731-375	75771217	0.375	½" MNPT x 8.00
731-500	75771218	0.500	½" MNPT x 8.00
731-750	75771201	0.750	½" MNPT x 8.00
731-1000	75771202	1.00	½" MNPT x 8.00
731-1500	75771203	1.50	½" MNPT x 8.00
732-2000	75771301	2.00	¾" MNPT x 8.75
732-2500	75771302	2.50	¾" MNPT x 8.75
732-3750	75771303	3.75	¾" MNPT x 8.75
732-5000	75771304	5.00	¾" MNPT x 8.75
733-7500	75771401	7.50	1" MNPT x 12.00
733-10,000	75771402	10.00	1" MNPT x 12.00

NOMENCLATURE

GAS FLOW COEFFICIENT	
Identifier	*Description*
Cv	Effective fully opened valve flow area; flow rate is dependent on inlet pressure, outlet pressure, gas type. See equations which follow.

PART NUMBER GENERATION PROCEDURE

With the selected Parent Number, specify the entire Part Number by selecting an Option for each Feature as shown in the example below:

75771301	2	1	1	1
Parent Number		**F1**	**F2**	

SERIES 730 SUMMARY OF FEATURES	
Feature	*Feature Description*
1	Valve Body Material / Process Connection Type
2	Rotor O'ring Material / Shut-off Disk Material

FIRST DIGIT OF FEATURE 1: VALVE BODY MATERIAL	
Option	*Description*
2	316L stainless steel
9	Special

SECOND DIGIT OF FEATURE 1: PROCESS CONNECTION TYPE	
Option	*Description*
1	Male NPT threads ends
3	Class 150 ANSI B16.5 flange ends
9	Special

FIRST DIGIT OF FEATURE 2: ROTOR O'RING MATERIAL	
Option	*Description*
1	Viton
8	Kalrez (Dupont™)
9	Special

SECOND DIGIT OF FEATURE 2: SHUT-OFF DISK MATERIAL	
Option	*Description*
1	Kel-F (Dupont™)
9	Special

VALVE SELECTION

1. To find Cv:

$$Cv = .044\ SCFM \sqrt{\frac{(460 + {}^{\circ}F)\ S.G.}{PSIA \times DP}}$$

S.G. = Specific Gravity of the Gas

PSIA = Absolute Pressure on Inlet Side of Valve

SCFM = Standard Cubic Feet Per Minute (25°C 760 mmHg)

DP = Differential Pressure across the Valve, PSIG

Note: When the upstream pressure is more than twice the down stream pressure the ΔP value used is half the absolute upstream pressure.

2. Contact the Kurz Representative or the Kurz factory to place the order or to obtain additional information.

Note: Specifications are subject to change without notice.

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