

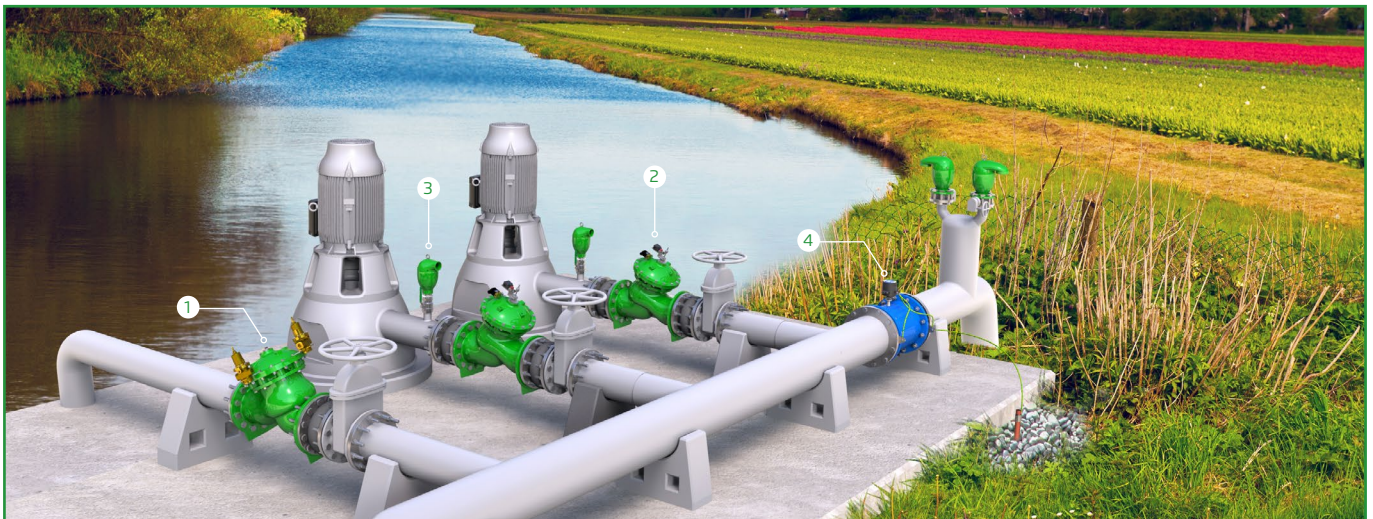
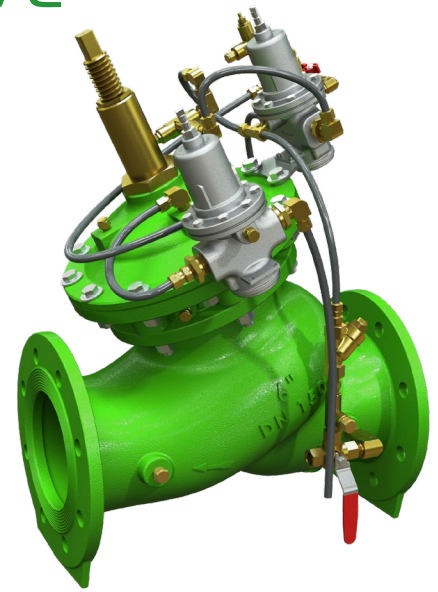
SURGE ANTICIPATING VALVE

Model IR-735-M

The Model 735-M Surge Anticipating Valve is an off-line, hydraulically operated, diaphragm actuated valve.

The valve, sensing line pressure, opens in response to the pressure drop associated with abrupt pump stoppage. The pre-opened valve dissipates the returning high pressure wave, eliminating the surge.

The Model 735-M smoothly closes drip tight as quickly as the relief feature allows, while preventing closing surge. The valve also relieves excessive system pressure.



[1] IR-735-M Surge Anticipating Valve

[2] IR-740 Pump Control Valve

[3] IR-C70-SP Air valve with surge protection disc

[4] MUT-2300 Water Meter

Typical Applications

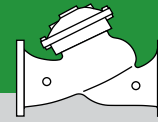
- Pumping stations for rising mains, elevated irrigation fields
- Pumping station for irrigation system with high potential for power failure

Features and Benefits

- Eliminates surge upon power failure
- Provides surge free switching between "on-duty" pumps
- Alternative for surge vessels
 - Relieves & discharge surge excessive energy
 - Easy maintenance
 - Minimum space, compact installation
 - Lower investment & maintenance costs
 - Especially economic for higher pressure ratings
- Line pressure driven
 - Independent operation
- No motor required
- Long term drip tight sealing
- Adjustable hydraulic actuation
- Double chamber
 - Moderated & smooth valve closing (no secondary closing surge)
 - Protected diaphragm
- In-line serviceable – Easy maintenance
- Obstacle free, full bore – Uncompromising reliability
- Balanced seal disk – High flow capacity

Full system data is required for surge analysis and optimal valve sizing: Pipe profile and characteristic, pumping station full details, valves and reservoirs.

All images in this catalog are for illustration only

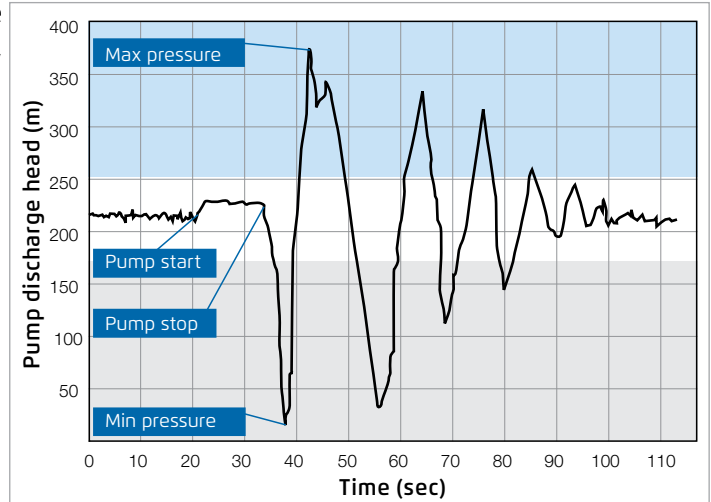


Operation:

Abrupt pump stoppage produces a pressure drop as the traveling column of water, with its inherent momentum, continues to travel along the line, generating severe low pressure.

When the traveling column of water loses its momentum, it travels back towards the pump. Should it hit the closed check valve, a very high pressure surge is created and travels throughout the system as a damaging wave at velocities of up to "Mach 4." No quick relief valve can react quickly enough to eliminate it.

Surge at Pump Station Without Protection



Eliminating surge requires anticipation and pre-action. The Model IR-735-M is well suited to this task.

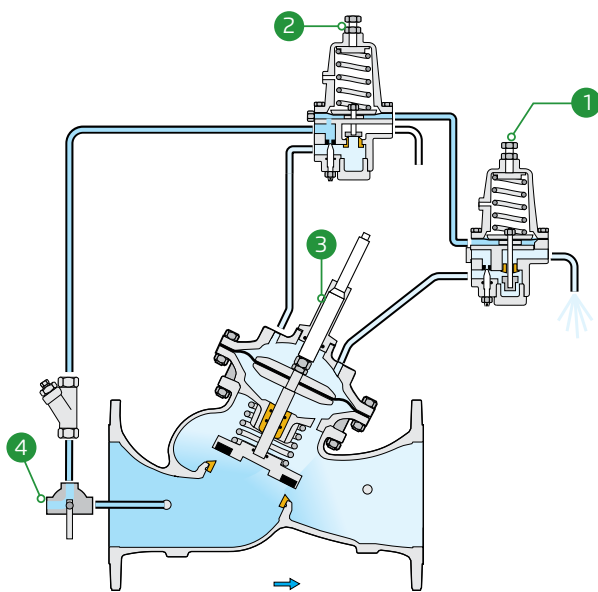
The Low Pressure (LP) pilot ❶ senses the initial pressure drop and opens. This immediate reaction allows remaining line pressure to quickly open the main valve.

The already opened Model 735-M releases the returning column of water, minimizing the line pressure rise. Should the relief rate be insufficient, and the pressure exceed the High Pressure (HP) pilot ❷ setting, the pilot immediately opens, further opening the main valve.

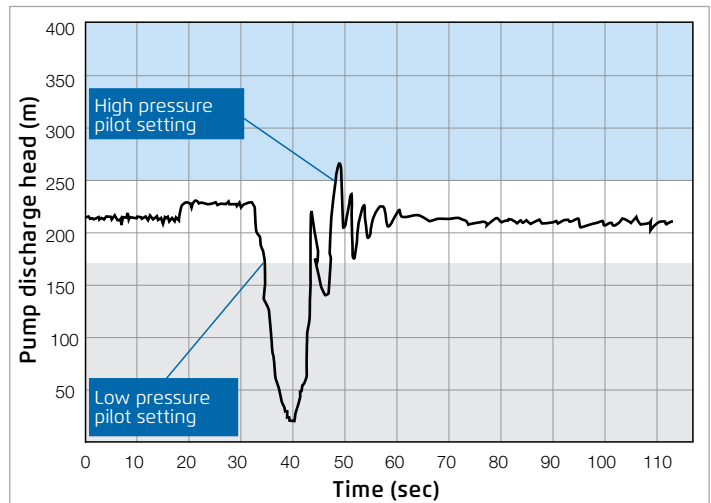
As system pressure stabilizes again at static pressure, both pilots close and the main valve begins closing. Should line pressure rise during main valve closing, the HP pilot would briefly stop the process, preventing the pressure from continuing to rise.

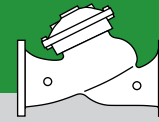
The flow stem ❸ limits the relief flow to prevent column separation and preserve closing pressure.

Cock valve ❹ serves for selecting operating and sensing source: Directly from main discharge line or alternatively from model IR-735 upstream port



Pressure at Pump Station Protected by Model IR-735-M





Flanged

700-SIGMA-ES Series

Y Pattern	DN	65	80	100	125	150	200	250	300	400	500	600	
	inch	2½"	3"	4"	5"	6"	8"	10"	12"	16"	20"	24"	
	ISO PN 10; 16; 25	L* (mm)	290	310	350	400	480	600	730	850	1,100	1,250	1,450
		W (mm)	190	210	255	270	320	380	450	540	660	815	920
		h (mm)	98	108	130	140	163	193	227	265	334	398	490
		H (mm)	242	252	318	375	411	506	600	721	943	1,220	1,240
		CCDV (lit)	0.125	0.125	0.3	0.45	0.5	2.15	4.5	8.5	12.4	29.8	29.8
		Weight (Kg)	18	22	38	62	78	125	198	306	515	1,085	1,290

* Maximum Dimensions (Length according to EN 558-1; ISO 5752)

700-SIGMA-EN Series

Y Pattern	DN	40	50	65	80	100	150	200	250	300	400	
	inch	1½"	2"	2½"	3"	4"	6"	8"	10"	12"	16"	
	ISO PN 10; 16; 25	L* (mm)	230	230	290	310	350	480	600	730	850	1,100
		W (mm)	155	165	180	210	255	320	400	480	570	815
		h (mm)	81	86	92	108	130	163	193	227	272	334
		H (mm)	234	246	290	252	318	514	618	725	881	1,171
		CCDV (lit)	0.125	0.125	0.125	0.3	0.45	2.15	4.5	8.5	12.4	29.8
		Weight (Kg)	12	14	20	28	47	96	158	256	403	974

* Maximum Dimensions (Length according to EN 558-1; ISO 5752)

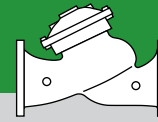
700 Series - M5, M6 & M5L

G Pattern	Type	DN	500	600	700	750	800	900	1000	1050	1200	
		inch	20"	24"	28"	30"	32"	36"	40"	42"	48"	
	M5	PN 16; 25	L (mm)**	1,250	1,450	1,460	1,750	1,850 1,865 ⁽¹⁾	-	-	-	-
			W (mm)	965	965	965	1,020	1,026 1,106 ⁽¹⁾	-	-	-	-
			h (mm)	385	435	493	530	530	-	-	-	-
			H (mm)	1,235	1,350	1,410	1,380	1,448	-	-	-	-
			CCDV (lit)	60	60	60	60	60	-	-	-	-
			Weight (kg)	1,318	1,590	1,745	1,711	1,920	-	-	-	-
	M6	PN 16; 25	L (mm)**	-	1,450 1,500 ⁽¹⁾	1,650	1,8750	1,850	1,850	-	-	-
			W (mm)	-	1,250	1,250	1,250	1,250	1,250	-	-	-
			h (mm)	-	470	490	520	552	600	-	-	-
			H (mm)	-	1,965	1,985	2,015	1,760	1,810	-	-	-
			CCDV (lit)	-	98	98	98	98	98	-	-	-
			Weight (kg)	-	3,250	3,700	3,900	4,100	4,250	-	-	-
	M5L	PN 16; 25	L (mm)**	-	-	-	1,750	1,850	2,050	2,250	2,251	2,252
			W (mm)	-	-	-	1,425	1,425	1,425	1,425	1,345	1,530
			h (mm)	-	-	-	507	545	600	660	693	785
			H (mm)	-	-	-	1,740	1,780	1,835	1,900	1,913	2,001
			CCDV (lit)	-	-	-	230	230	230	230	230	230
			Weight (kg)	-	-	-	3,300	3,200	3,350	3,710	4,216	4,062

* Maximum Dimensions (Length according to EN 558-1; ISO 5752)

** Length may vary according to flange standard.

⁽¹⁾ PN25



IR-735-M

Technical Data

Pressure Rating

PN 10, 16 & 25 (According to Connection Rating)

Flanged:

SO 7005-2 (ISO 10, 16 & 25)
ASME B165 CLASS 150 & 300
JIS B2210 10K, 16K
BS10 BSTD & BSTH
ABNT NBR 7675 PN10, 16 & 25
AS 4087 PN16 & 35

Materials:

Body & actuator:

Ductile Iron

Bolts, nuts & studs:

Stainless Steel

Internals: Stainless Steel, Tin Bronze & Coated Steel

Diaphragm: Fabric-reinforced synthetic rubber

Seals: Synthetic rubber

Coating: Green fusion bonded Polyester

Control Accessories:

Tubing and Fittings:

Brass & Reinforced Plastic

Accessories:

Brass, bronze

Pilot standard materials:

Body, cover & actuator:
Stainless Steel, Bronze or Brass

Elastomers:

Synthetic rubber

Internals and Spring:

Stainless Steel

Standard Spring Setting

Range:

0-16 bar, for other options please consult factory

Angel pattern & threaded ends are available in 700 series:

DN40 - DN450; 1½" - 18" - Angle

DN40-DN80; 1½"-3"- Threaded BSP or NPT

Flow Properties

700-SIGMA-ES		DN	65	80	100	125	150	200	250	300	400	500	600
		inch	2½"	3"	4"	5"	6"	8"	10"	12"	16"	20"	24"
Y-Pattern Flat Disc		Kv	60	65	143	215	395	610	905	1,520	2,250	3,300	3,300
Y-Pattern U-Plug		Kv	51	55	123	183	336	519	769	1,292	2,027	2,970	2,970

700-SIGMA-EN		DN	40	50	65	80	100	150	200	250	300	400
		inch	1½"	2"	2½"	3"	4"	6"	8"	10"	12"	16"
Y-Pattern Flat Disc		Kv	57	62	98	130	200	540	905	1,480	2,140	3,330
Y-Pattern U-Plug		Kv	46	48	73	102	140	453	767	1,310	1,940	2,970

700-M5; 700-M6; 700-M5L

			M5	M6	M5L
G-Pattern Flat Disc		Kv	5,020	7,150	11,150

Valve Flow Coefficient

$$\Delta P = \left(\frac{Q}{Kv} \right)^2$$

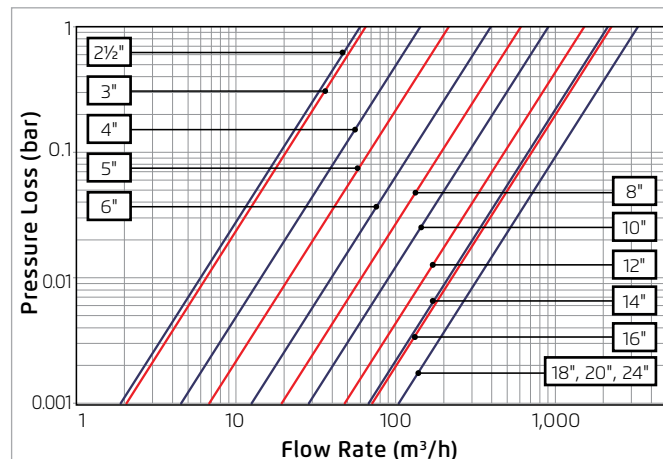
Kv = m³/h @ ΔP of 1 bar

Q = m³/h

ΔP = bar

Flow Chart

700-Sigma-ES



700-Sigma-EN; 700; -M5; -M6; -M5L

