CONTENT ***PAGE***

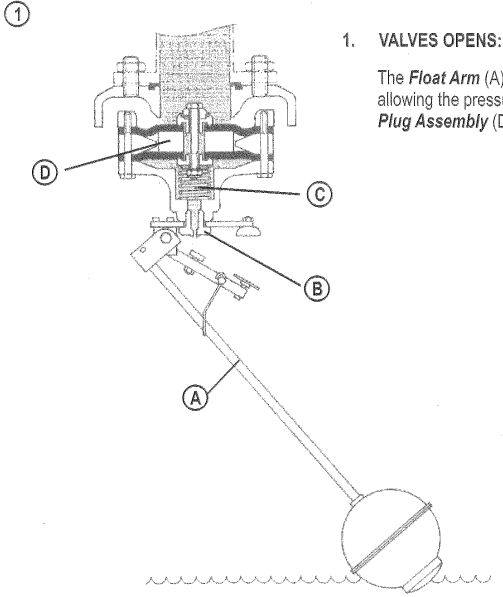
LevelDex®

LEVEL CONTROL VALVES

LevelDex® - OPERATING PRINCIPLE

NOTE: ***LevelDex®*** is a hydraulic, differential area control valve that uses upstream pressure to function. The Pilot exerts no mechanical force on the valve.

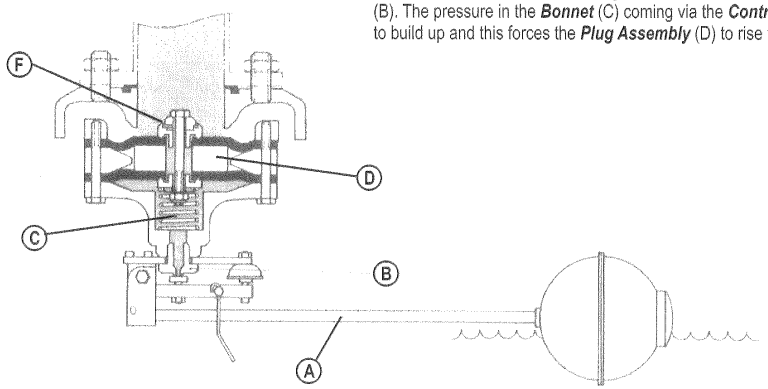
(1)



1. **VALVES OPENS:**

The ***Float Arm*** (A) follows the water surface down opening the ***Pilot Nozzle*** (B), allowing the pressure in the ***Bonnet*** (C) to drop, allowing the pressure above the ***Plug Assembly*** (D) to force the plug down and away from the seat.

(3)



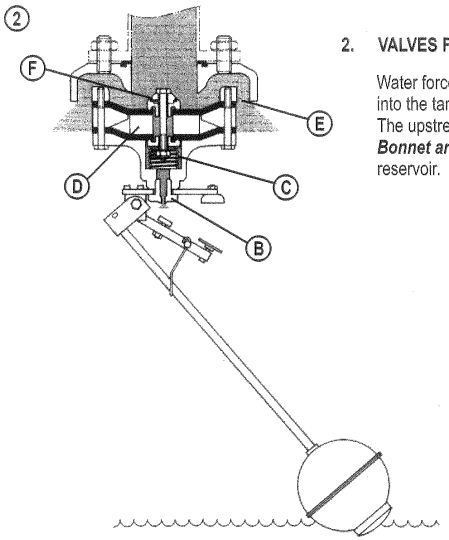
1. **VALVES BEGINS TO CLOSE:**

The ***Float Arm*** (A) follows the rising water surface and closes off the ***Pilot Nozzle*** (B). The pressure in the ***Bonnet*** (C) coming via the ***Control Orifice*** (F) is now able to build up and this forces the ***Plug Assembly*** (D) to rise toward the valve seat.

LEVEL CONTROL VALVES

LevelDex® - OPERATING PRINCIPLE

NOTE: ***LevelDex®*** is a hydraulic, differential area control valve that uses upstream pressure to function. The Pilot exerts no mechanical force on the valve.

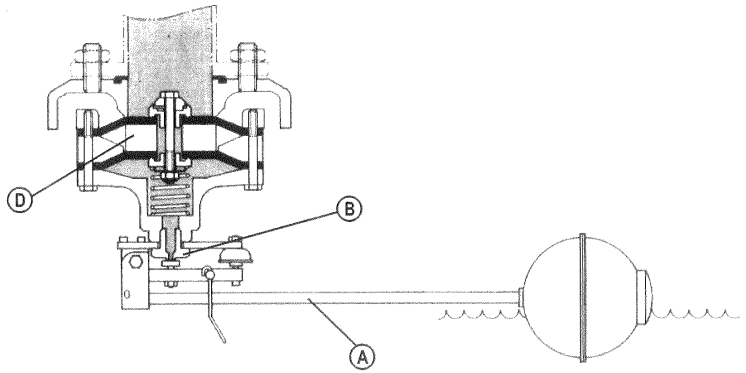


2. VALVES FULLY OPEN:

Water forces the ***Plug Assembly*** (D) down and exits via the ***Annular Outlets*** (E) into the tank / reservoir.
The upstream pressure goes into the ***Control Orifice*** (F) and down into the ***Bonnet area*** (C) and is able to exit out of the ***Pilot Nozzle*** (B) into the tank / reservoir.

4. VALVE FULLY CLOSED:

The ***Plug Assembly*** (D) is forced up against the valve seat and the valve is closed and will remain closed until the ***Pilot Nozzle*** (B) is re-opened by the ***Float Arm*** (A) following the receding water level in the tank / reservoir.



LevelDex®

LEVEL CONTROL VALVES

LevelDex® - TECHNICAL DATA

LevelDex® Valves are available as standard, for service at Static Pressures of 160 m H_2O (232 psi) and Dynamic Pressures of 10 m H_2O (14,2 psi) for model 1601 valves and 50 m H_2O (71 psi) for model 1605 valves (see table below). Valves for service at higher static and or dynamic pressures are available on request.

Model	STATIC (CLOSED VALVE) MAX DIFFERENTIAL m H_2O	MAX DIFFERENTIAL psi	DYNAMIC (OPEN VALVE) Max. M H_2O	Max. psi	Min. M H_2O	Min. psi
1601	160	232	10	14.2	1	1.42
1605	160	232	50	71.0	5	7.1

LevelDex® - STANDARD FLOW CHARACTERISTICS (FULLY OPEN VALVE)

Basic Formula (Kv): $Q = Kv \sqrt{?H}$

Where: Q= Flow in litres / sec (ℓ/s)
Where: ?H= Differential Head in Meters H_2O
Kv = Flow Coefficient (flow in ℓ/s for 1m ?H)

Basic Formula (Cv): $Q = Cv \sqrt{?P}$

Where: Q= Flow in US Gallons.min. (G.P.M.)
Where: ?P= Differential Pressure psi (lbs/in^2)
Cv = Flow Coefficient (flow in G.P.M. For 1psi ?P)

Kv/Cv TABLES

Valve Size	Kv/Cv	50 (2")	80 (3")	100 (4")	150 (6")	200 (8")
Model 1601	Kv	2.94	8.06	14.93	27.67	45.28
	Cv	39.1	106.4	196.6	368.1	602.0
Model 1605	Kv	2.75	8.06	13.3	26.06	43.96
	Cv	36.64	107.2	176.8	346.7	584.7

LevelDex® - RECOMMENDED MAXIMUM & MINIMUM FLOW - U.S GALLONS / MIN

Valve Size		50 (2")	80 (3")	100 (4")	150 (6")	200 (8")
Model 1601	Max Flow	147.3	401.0	740.8	1387.1	2268.5
	Min Flow	46.6	126.8	234.3	438.6	717.4
Model 1605	Max Flow	306.7	903.3	1489.7	2921.3	4926.7
	Min Flow	96.9	285.6	471.1	921.9	1557.9

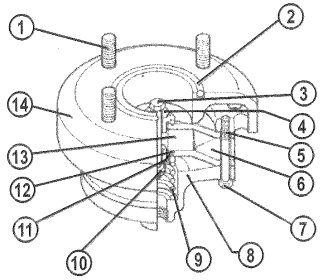
LevelDex® - RECOMMENDED MAXIMUM & MINIMUM FLOW - LITRES/SEC.

Valve Size		50 (2")	80 (3")	100 (4")	150 (6")	200 (8")
Model 1601	Max Flow	9.3	25.4	47.2	87.5	143.2
	Min Flow	2.94	8.06	14.93	27.67	45.28
Model 1605	Max Flow	19.4	56.7	94.05	184.3	310.8
	Min Flow	6.15	17.89	29.74	58.3	98.3

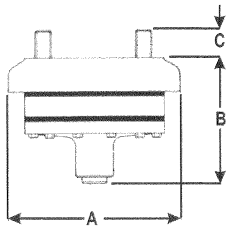
LEVEL CONTROL VALVES

LevelDex® - TECHNICAL DATA

LevelDex® - MATERIALS OF



Item No.	Description	Material Specification
1	Studs	Stainless Steel 304
2	O-Ring	Nitrile
3	Bolt	Stainless Steel Gr. A2
4	Restrictor	Stainless Steel 304
5	Upper Filter	Gunmetal
6	Support Ring	High Density Polyethylene
7	Bolt	Stainless Steel Gr. A2
8	Bonnet	Cast Iron, Fusion Bonded Epoxy Powder Coated
9	Spring	SAE Stainless Steel
10	Nut	Stainless Steel Gr. A2
11	Lower Filter	Stainless Steel Gr. A2 and Brass
12	Diaphragm	EPDM
13	Plug	High Density Polyethylene
14	Body	Cast Iron, Fusion Boded Epoxy Powder Coated



LevelDex® - DIMENSIONS AND WEIGHTS

NOTE 1: All **LevelDex®** Valves are supplied with stud connections suitable for alignment to flanges conforming to PN10 or PN16 ratings of SANS1123 & BS EN 1092 standard or ANSI B.16.1 class 150.

NOTE 2: **LevelDex®** Valves are controlled by either a direct mounted two level magnetic latch pilot suitable for DN 50 (2") to DN 150 (6") valves (see page 5) or a remote mounted two level magnetic latch pilot suitable for DN 50 to DN 200 valves (See page 6).

Valve Size		Valve Model No.	A		B		C		Weight	
mm	inches		mm	inches	mm	inches	mm	inches	kg.	lbs
50	(2")	1601	180	7 3/32	129	5 3/32	32	1 9/32	6	13,2
		1605	180	7 3/32	135	5 5/16	32	1 9/32	6	13,2
80	(3")	1601	212	8 11/32	144	5 11/16	32	1 9/32	10	22,1
		1605	212	8 11/32	150	5 29/32	32	1 9/32	10	22,1
100	(4")	1601	270	10 21/32	190	7 1/2	47	1 7/8	18	39,7
		1605	270	10 21/32	196	7 23/32	47	1 7/8	18	39,7
150	(6")	1601	350	13 25/32	226	8 29/32	47	1 7/8	34	77,2
		1605	350	13 25/32	232	9 1/8	47	1 7/8	34	77,2
200	(8")	1601	448	17 1/2	282	11 1/8	47	1 7/8	96	211,7
		1605	448	17 1/2	288	11 11/32	47	1 7/8	96	211,7

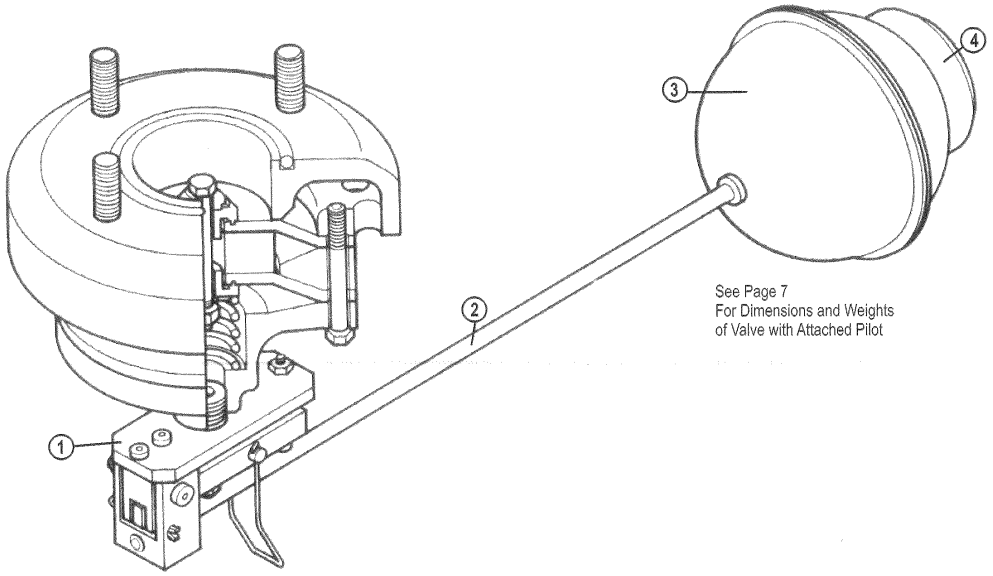
LevelDex®

LEVEL CONTROL VALVES

LevelDex® - TECHNICAL DATA

DIRECT MOUNTED TWO LEVEL MAGNETIC LATCH PILOT WITH SHORT DEAD BAND

Model No. LM 2500
(Recommended for DN 50 (2") to DN 150 (6") Valves)



See Page 7
For Dimensions and Weights
of Valve with Attached Pilot

1. Pilot Body: Stainless Steel 304
2. Float Arm: Stainless Steel 304
3. Float: ABS Plastic
4. Float Weight: Cast Iron - Epoxy Powder Coated
   Fasteners: Stainless Steel 304
   Attachment: ½" BSP/NPT Male to Valve Bonnet
   Weight: 2,5kg. (5,5lbs)

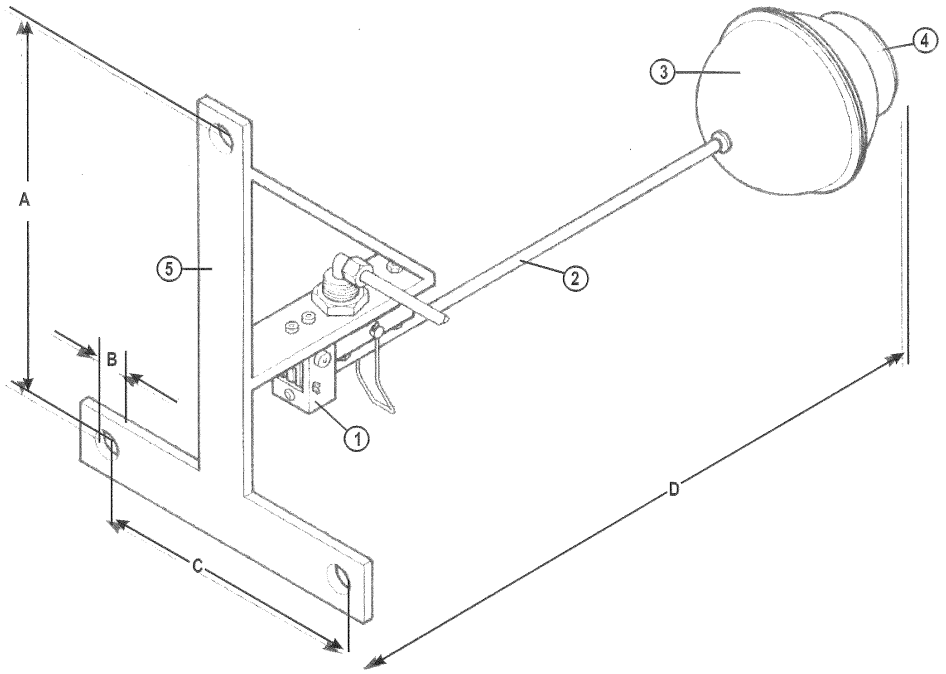
Supplied as standard on DN. 50 (2") to DN. 150 (6") **LevelDex®** Valves.

LEVEL CONTROL VALVES

LevelDex® - TECHNICAL DATA

REMOTE MOUNTED TWO LEVEL MAGNETIC LATCH PILOT WITH SHORT DEAD BAND

Model No. LR 2500
(Recommended for DN 50 (2") to DN 200 (8") Valves)



1. Pilot Body: Stainless Steel 304
2. Float Arm: Stainless Steel 304
3. Float: ABS Plastic
4. Float Weight: Cast Iron - Epoxy Powder Coated
   Fasteners: Galvanized Mild Steel
   Attachment: ¼" Tube to Valve Bonnet
   Weight: 4kg. (8,8 lbs)

Supplied as standard on DN. 200 (8") ***LevelDex®*** Valves.

A		B		C		D	
mm	inches	mm	inches	mm	inches	mm	inches
292	11½	∅17,5	∅ 11/16	156	6 5/32	930	36 5/8

NOTE:
Supplied as standard on all DN200 (8") ***LevelDex®*** valves but can be used on the whole range..

LevelDex®

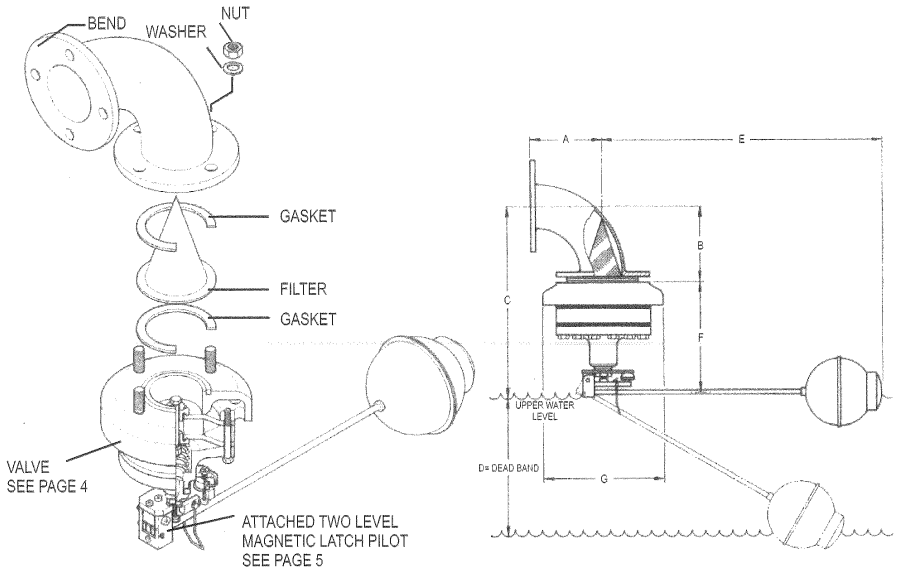
LEVEL CONTROL VALVES

LevelDex® - TECHNICAL DATA

LevelDex® - OVERALL DIMENSIONS AND PRE-FILTRATION OPTION

All control valves are susceptible to malfunction or damage caused by debris in the pipeline. An optional strainer protects the ***LevelDex®*** from malfunction or damage. The strainer is easily accessible for the purpose of cleaning. *(Note: Pre filtration may reduce valve performance)*

Bend/ Attached Pilot Arrangement
(Recommended for DN 50 (2") to DN 150 (6") Valves)



Valve Size		Valve Model No.	A		B		C		D		E		F		G		Weight	
mm	in		mm	in	mm	in	mm	in	mm	in	mm	in	mm	in	mm	in	mm	in
50	(2")	050 LX 1601	130	5 1/8	139	5 1/2	318	12 3/8	305	12	660	26	179	7 1/16	180	7 1/8	15	33,1
		050 LX 1605	130	5 1/8	139	5 1/2	318	12 3/4	305	12	660	26	185	7 5/16	180	7 1/8	15	33,1
80	(3")	080 LX 1601	114	4 1/2	123	4 7/8	317	12 1/2	305	12	660	26	194	7 11/16	212	8 3/8	20	44,1
		080 LX 1605	114	4 1/2	123	4 7/8	323	12 3/4	305	12	660	26	200	7 7/8	212	8 3/8	20	44,1
100	(4")	100 LX 1601	152	6	161	6 3/8	401	15 13/16	305	12	660	26	240	9 7/16	270	10 5/8	29	64,0
		100 LX 1605	152	6	161	6 3/8	407	16 1/32	305	12	660	26	246	9 7/8	270	10 5/8	29	64,0
150	(6")	150 LX 1601	229	9 1/32	238	9 3/8	512	20 1/8	375	14 3/4	810	31 7/8	274	10 13/16	350	13 13/16	53	117,0
		150 LX 1605	229	9 1/32	238	9 3/8	518	20 13/16	375	14 3/4	810	31 7/8	280	11 1/32	350	10 13/16	53	117,0

NOTE 1: The bend shown can be supplied but this is not always the case (model 'LD' denotes inclusion of bend. Refer to ordering guide on page 13.)

NOTE 2: The weights given exclude the bend.

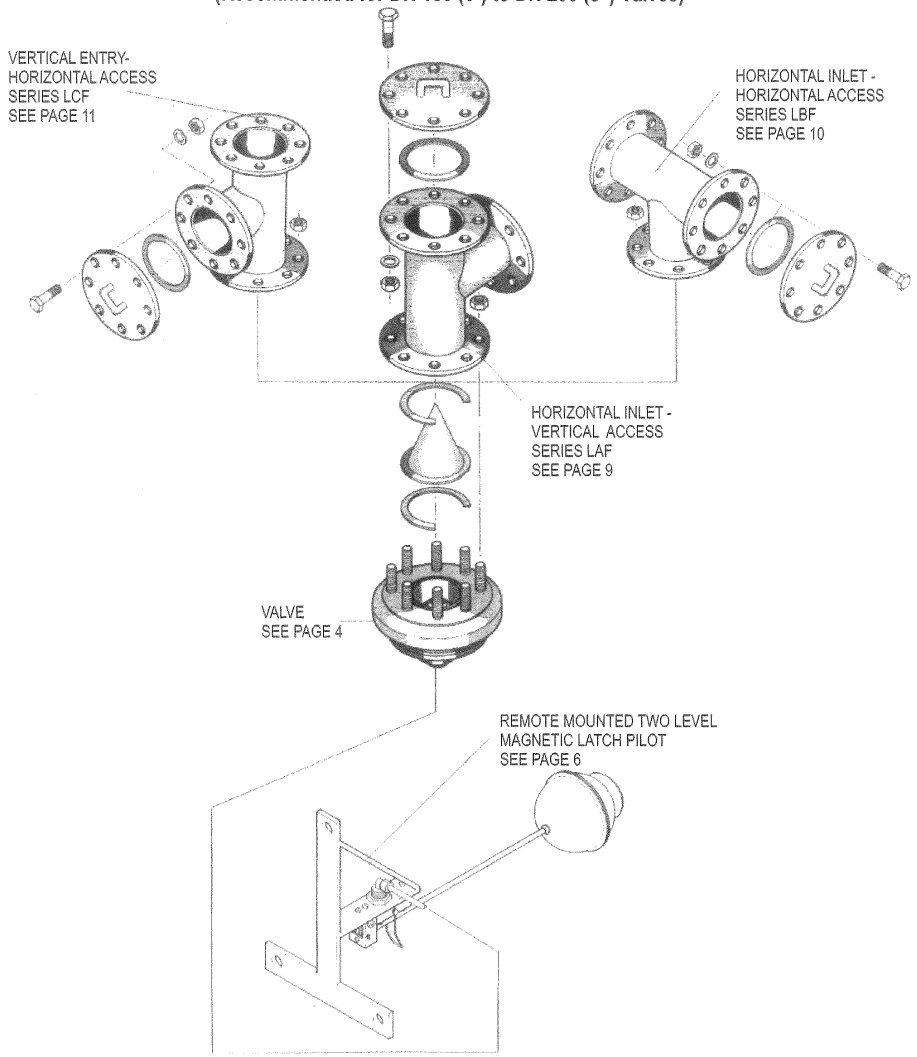
LEVEL CONTROL VALVES

LevelDex® - TECHNICAL DATA

LevelDex® - PRE FILTRATION OPTIONS

All control valves are susceptible to malfunction or damage caused by debris in the pipeline. An optional strainer protects the **LevelDex®** from malfunction or damage. The strainer is easily accessible for the purpose of cleaning. *(Note: Pre filtration may reduce valve performance)*

Filter Box / Remote Pilot Arrangements
(Recommended for DN 150 (6") to DN 200 (8") Valves)



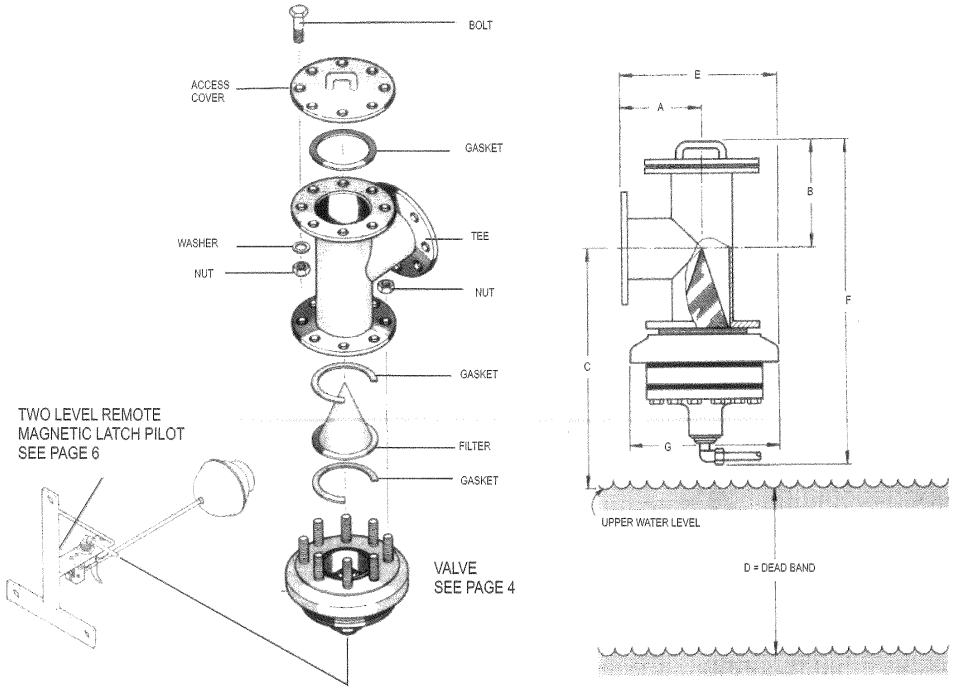
LevelDex®

LEVEL CONTROL VALVES

LevelDex® - TECHNICAL DATA

LevelDex® - OVERALL DIMENSIONS AND PRE-FILTRATION OPTION

Horizontal Inlet - Vertical Filter Access
Series LAFR
(Recommended for DN 150 (6") to DN 200 (8") Valves)



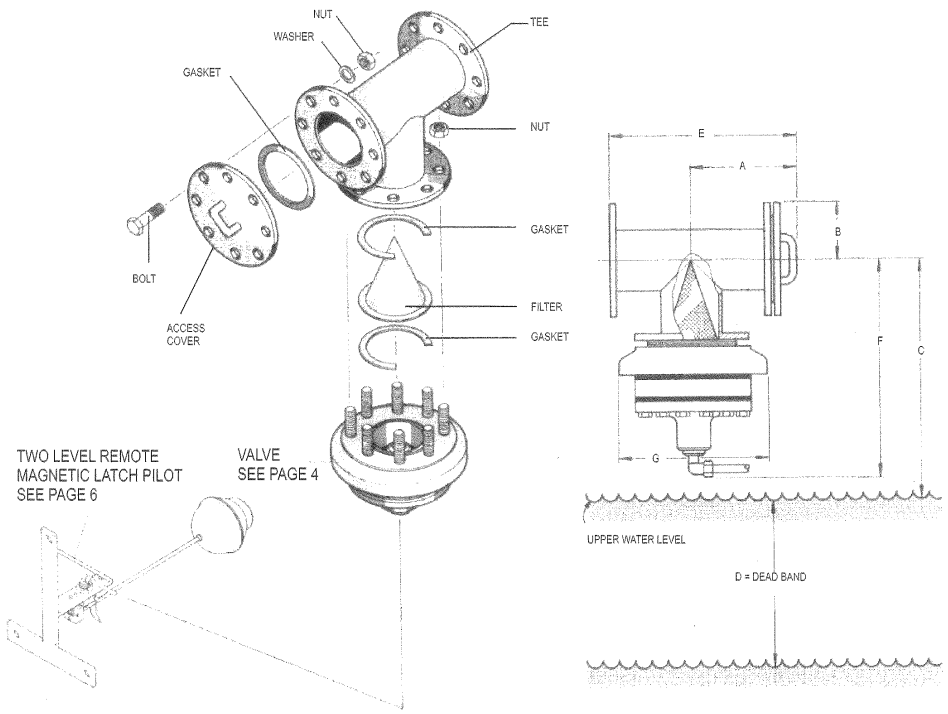
Valve Size		Valve Model No.	A		B		C		D		E		F		G		Weight	
mm	in		mm	in	mm	in	mm	in	mm	in	mm	in	mm	in	mm	in	mm	in
150	6"	150 LAFR 1601	229	9 1/32	315	12 7/16	492	19 3/8	375	14 3/4	404	15 29/32	807	31 13/16	350	13 3/4	70	154,3
		150 LAFR 1605	229	9 1/32	315	12 7/16	498	19 5/8	375	14 3/4	404	15 29/32	813	32	350	13 3/4	70	154,3
200	8"	200 LAFR 1601	305	12	397	15 5/8	620	24 7/16	375	14 3/4	529	20 5/32	1017	40 1/16	448	17 21/32	150	331,0
		200 LAFR 1605	305	12	397	15 5/8	626	24 21/32	375	14 3/4	529	20 5/32	1023	40 5/16	448	17 21/32	150	331,0

NOTE 1: Valve comes complete with remote pilot, model LR 2500 unless an alternative is specified

LEVEL CONTROL VALVES

LevelDex® - OVERALL DIMENSIONS AND PRE-FILTRATION OPTION

Horizontal Inlet - Vertical Filter Access
Series LBFR
(Recommended for DN 150 (6") to DN 200 (8") Valves)



Valve Size		Valve Model No.	A		B		C		D		E		F		G		Weight	
mm	in		mm	in	mm	in	mm	in	mm	in	mm	in	mm	in	mm	in	mm	in
150	6"	150 LBFR 1601	315	12 13/32	143	5 23/32	492	19 3/8	375	14 3/4	544	21 13/32	492	19 3/8	350	13 13/16	70	154,3
		150 LBFR 1605	315	12 13/32	143	5 23/32	498	19 5/8	375	14 3/4	544	21 13/32	498	19 5/8	350	13 13/16	70	154,3
200	8"	200 LBFR 1601	398	15 11/16	170	6 11/16	620	24 13/32	375	14 3/4	703	27 11/16	620	24 13/32	448	17 21/32	150	331,0
		200 LBFR 1605	398	15 11/16	170	6 11/16	626	24 21/32	375	14 3/4	703	27 11/16	626	24 21/32	448	17 21/32	150	331,0

NOTE 1: Valve comes complete with remote pilot, model LR 2500 unless an alternative is specified

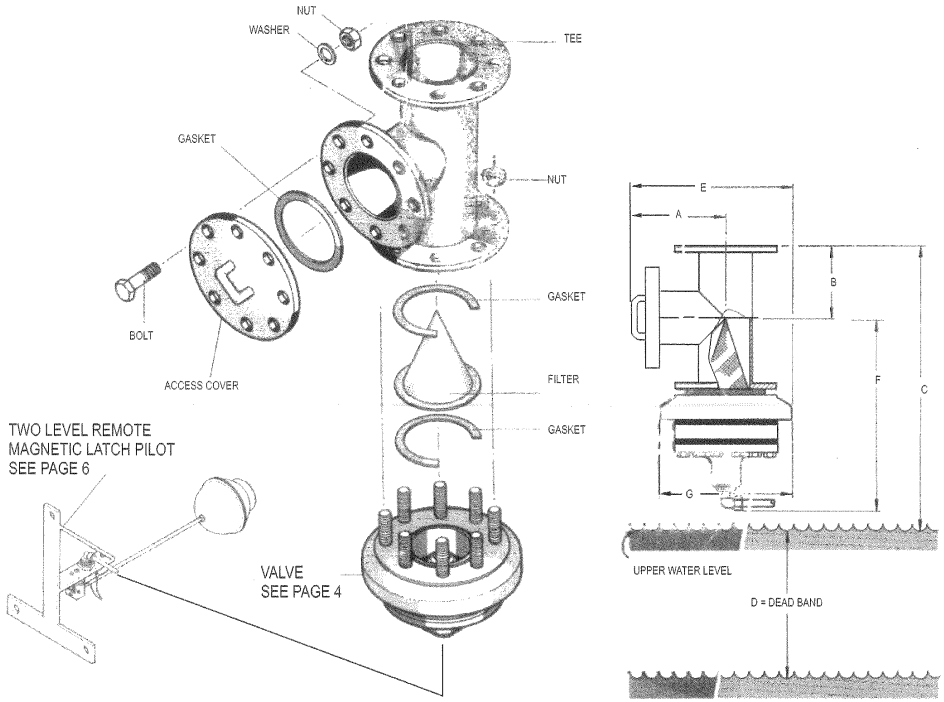
LevelDex®

LEVEL CONTROL VALVES

LevelDex® - TECHNICAL DATA

LevelDex® - OVERALL DIMENSIONS AND PRE-FILTRATION OPTION

Vertical Inlet - Horizontal Filter Access
Series LCFR
(Recommended for DN 150 (6") to DN 200 (8") Valves)



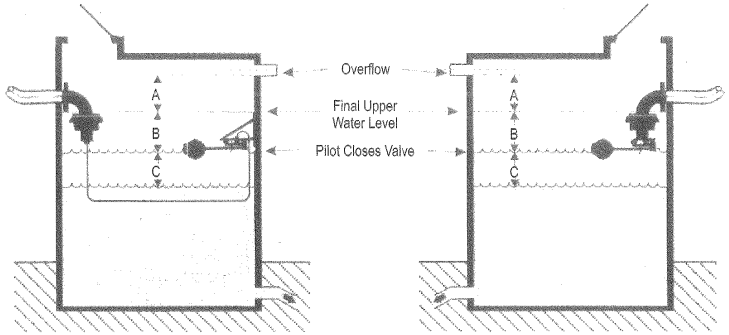
Valve Size		Valve Model No.	A		B		C		D		E		F		G		Weight	
mm	in		mm	in	mm	in	mm	in	mm	in	mm	in	mm	in	mm	in	mm	in
150	6"	150 LCFR 1601	315	12 13/32	229	9 1/32	721	28 3/8	375	14 3/4	490	19 5/16	492	19 3/8	350	13 13/16	70	154,3
		150 LCFR 1605	315	12 13/32	229	9 1/32	727	28 5/8	375	14 3/4	490	19 5/16	498	19 5/8	350	13 13/16	70	154,3
200	8"	200 LCFR 1601	398	15 11/16	305	12 1/32	925	36 7/16	375	14 3/4	622	24 1/2	620	24 13/32	448	17 21/32	150	331,0
		200 LCFR 1605	398	15 11/16	305	12 1/32	931	36 5/32	375	14 3/4	622	24 1/2	626	24 21/32	448	17 21/32	150	331,0

NOTE 1: Valve comes complete with remote pilot, model LR 2500 unless an alternative is specified

LEVEL CONTROL VALVES

LevelDex® - TECHNICAL DATA

LevelDex® - Closing discharge.
(The amount of water discharged after the pilot closes).



LevelDex® - DIMENSIONS AND WEIGHTS

NOTE: Valve is indicated with an attached bend (Series LD) but the discharge is true for all LevelDex® valve types.
The discharge value is according to the flow rate through the valve
The calculations are given at an estimated closing time of 300 seconds (5 minutes).
The placement of the remote pilot in a remote pilot application will decide the final water level.

DIMENSION A: Allow a space between the bottom of the overflow and the final water level for surface turbulence

DIMENSION B: Decide on the final system flow in L/s (U.S. Gallons / min) and insert into the calculation below.

DIMENSION C: (Pilot Deadband)
Attached Pilot: DN50 (2") to DN50 (2") to DN100 (4") = 305mm (12") Attached Pilot: DN150 (6") = 375mm (14 ¾ ")
Remote Pilot: All Valve Sizes = 375mm (14 ¾ ").

HOW TO CALCULATE DIMENSION B:

1. Square or Rectangular Tank:

Discharge: $\left(\frac{\text{L/s}}{6{,}6}\right)$ ÷ Area of Tank (metres) = Dimension B Discharge

1. Square or Rectangular Tank:

Discharge: $\left(\frac{\text{U.S. Gallons/min.}}{2{,}968}\right)$ ÷ Area of Tank (feet) = Dimension B

EXAMPLE: A Valve Discharges at 120 L/s (1902 U.S. Gallon/min.) Into a Tank 15 metres (49,2 feet) in length by 5 metres (16,4 feet) in breadth, calculate dimension B.

Discharge: $\left(\frac{\text{120L/s}}{6{,}6}\right)$ ÷ Area of Tank (15m x 15m) = 0,242m

2. Round Tank:

Discharge: $\left(\frac{\text{L/s}}{6{,}6}\right)$ ÷ $\left(\text{Diameter of Tank}^2 \times \frac{\pi}{4}\right)$ Dimension B

3. Any Other Shape Tank:

Discharge: $\left(\frac{\text{L/s}}{6{,}6}\right)$ ÷ Surface Area of Tank in m = Dimension B in m.

Discharge: $\left(\frac{\text{1902 U.S. Gallons/min.}}{2{,}968}\right)$ ÷ Area of Tank (49,2" x 16,4") = 0,794 ft

2. Round Tank:

Discharge: $\left(\frac{\text{U.S. Gallons/min.}}{2{,}968}\right)$ ÷ $\left(\text{Diameter of Tank}^2 \times \frac{\pi}{4}\right)$ = Dimension B

3. Any Other Shape Tank:

Discharge: $\left(\frac{\text{U.S. Gallons/min}}{2{,}968}\right)$ ÷ Surface Area of Tank in ft = Dimension B in ft

LevelDex®

LEVEL CONTROL VALVES

LevelDex® - ORDERING GUIDE

Model No. Key

VALVE SIZE:

DN50	(2")	050
DN80	(3")	080
DN100	(4")	100
Dn150	(6")	150
DN200	(8")	200

PRODUCT SERIES: LevelDex® — LX

STANDARD PRODUCT VARIATIONS:

No Bend or Filter Box	X
With Long Radius Bend	D
Filter Box - Horizontal Inlet - Vertical Access	A
Filter Box - Horizontal Inlet - Horizontal Access	B
Filter Box - Vertical Inlet - Horizontal Access	C

CONE FILTER: Filter F

PILOT:
Attached Pilot
Remote Pilot R

Maximum Static Working Pressure (Closed Valve)
160m H_2O (227psi) 16

Maximum Dynamic ΔP (Valve Fully Open)
10m H_2O (12,2psi) 01
50m H_2O (71 psi) 05

ADD ON FEATURES TO BASIC LevelDex® VALVES

ADD ON FEATURES	VALVE SIZE	50(2")	80(3")	100(4")	150(6")	200(8")
	LONG RADIUS BEND					
	FILTER BOX - HORIZONTAL INLET - VERTICAL ACCESS					
	FILTER BOX - HORIZONTAL INLET - HORIZONTAL ACCESS					
	FILTER BOX - VERTICAL INLET - HORIZONTAL ACCESS					
	FILTER					
	ATTACHED TWO LEVEL MAGNETIC LATCH PILOT					
	REMOTE TWO LEVEL MAGNETIC LATCH PILOT					

NOTE: This key refers to popular valve configurations and is not an indication of the limit of available variations, should there be a requirement which does not appear in the key please enquire.

WHEN ORDERING PLEASE SPECIFY:

- Valve size
- Desired Flange Alignment
- Static (Working) & Dynamic (Valve Fully Open) Pressure
- Desired Flow Rate

LEVEL CONTROL VALVES

APPLICATION PROBLEMS	LevelDex® SOLUTION
1. Water surface turbulence influence many valves, sometimes causing unacceptable high pressure surges in a system.	A unique magnetic latch differential pilot ensures that the LevelDex® will close/open positively even when operating in severely turbulent applications.
2. Inherent in all end level control valve applications is the problem of cavitation due to the necessary dissipation of excess energy. Generally valves have a limited capacity in this regard and maximum pressure drops quoted are in the region of 4m H_2O (5,7 ps) for mechanical valves and 20m H_2O (28,4 psi) for hydraulic types.	The LevelDex® design prevents internal cavitation and the consequent damage to sealing components by discharging through the specially dimensioned ports relative to the annular flow area between seat and disc. This causes cavitation to occur outside the valve at comparatively high dynamic differential pressures of up to 50m H_2O (71 psi) for standard valves.
3. Surges caused by the closing characteristic of mechanical valves and hydraulic valves without sophisticated closing speed or relief controls can be damaging to the piping system.	A characteristic whereby deceleration of the closing rate occurs in the critical period just before the valve closure, and an operating feature whereby the valve will hesitate during the closing cycle if the rate of dynamic differential pressure increase is too steep, causes the LevelDex® to dampen out severe surges.
4. On pumping systems modulating or mechanical valves increasingly throttle against the pump as the reservoir level rises and, consequently, the additional pumping energy required can be significant in terms of electricity and maintenance costs.	The LevelDex® does not throttle due to the rising or lowering of a reservoir level and, apart from the relatively short closing or opening cycles, is always either open or closed
5. All control valves including the LevelDex® are susceptible to malfunction or damage caused by debris in the pipeline.	An optional cone strainer protects the LevelDex® from malfunction or damage. The strainer is easily accessible for the purpose of cleaning.
6. End line level control valves are generally large, weighty and difficult to service.	LevelDex® valves are comparatively light, compact and extremely simple to service without any special tools or lifting equipment

LevelDex®

LEVEL CONTROL VALVES

Complete the form below for any additional information and fax/post to:

DFC Water (Pty) Ltd
P. O. Box 5064
Benoni South
1502
South Africa

Tel: (+27 11) 748 0200 **Fax: (+27 11) 421 2749**

E Mail: ventomat@dfc.co.za **www.ventomat.com**

Company Name: _____

Postal Address: _____

_____

Postal Code: _____ **Country:** _____

Tel: _____ **Fax:** _____

Contact Name: _____ **Title:** _____

Comments:

_____

_____

Products you are interested in:

VENT-O-MAT® Series RBX Air Release & Vacuum Break Valves ☐
compact stainless steel single chamber design with integral "Anti-Shock" surge dampening mechanism.

VENT-O-MAT® Series RGX Air Release & Vacuum Break Valves ☐
compact Stainless Steel single chamber design with integral "Anti-Shock" surge dampening mechanism.

VENT-O-MAT® Series RC Air Release & Vacuum Break Valves ☐
cast air valve for irrigation and small reticulation systems.

VENT-O-MAT® Series RPS Air Release & Vacuum Break Valves ☐
glass reinforced polypropylene CATT air valve for industrial, irrigation and small reticulation systems.