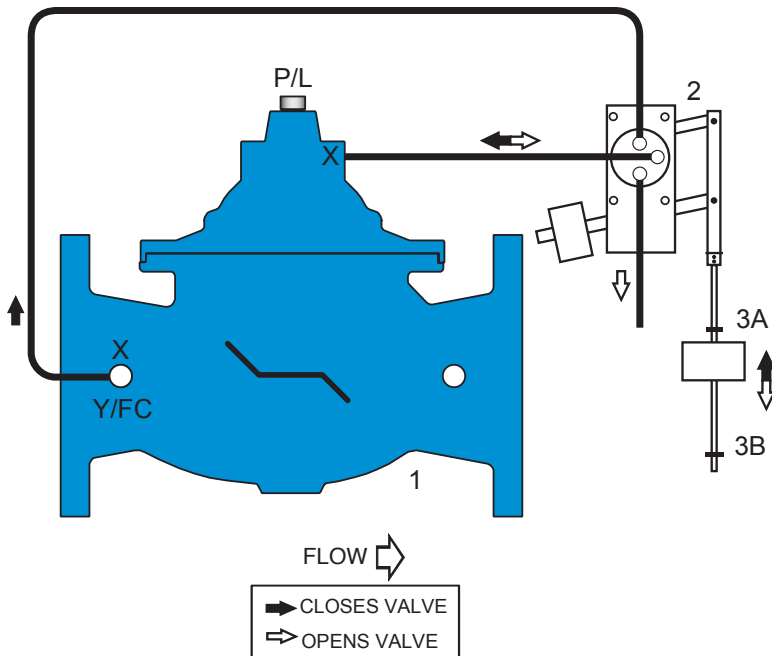


## CLASSIC SERIES

## F110-14 (Globe) F1110-14 (Angle)

### Schematics

- Opens when float reaches low level stop
- Closes when float reaches high level stop
- Low and High Level stop collars are adjustable



### Standard Components

- 1 - Main Valve (Single Chamber)
- 2 - On-Off Float Control
- 3A - High Level Adjustment Stop
- 3B - Low Level Adjustment Stop

### Options & Accessories

- X - Isolation Cocks <sup>(2)</sup>
- FC - Flo-Clean Strainer <sup>(1)</sup>
- Y - Y-Strainer (Replaces Flo-Clean) <sup>(2)</sup>
- AOS – Adjustable Opening Speed <sup>(3)</sup>
- P - Position Indicator <sup>(3)</sup>
- L - Limit Switch <sup>(3)</sup>

<sup>(1)</sup> Standard 3" & Smaller  
<sup>(2)</sup> Standard 4" & Larger  
<sup>(3)</sup> Optional All Sizes

### Operations

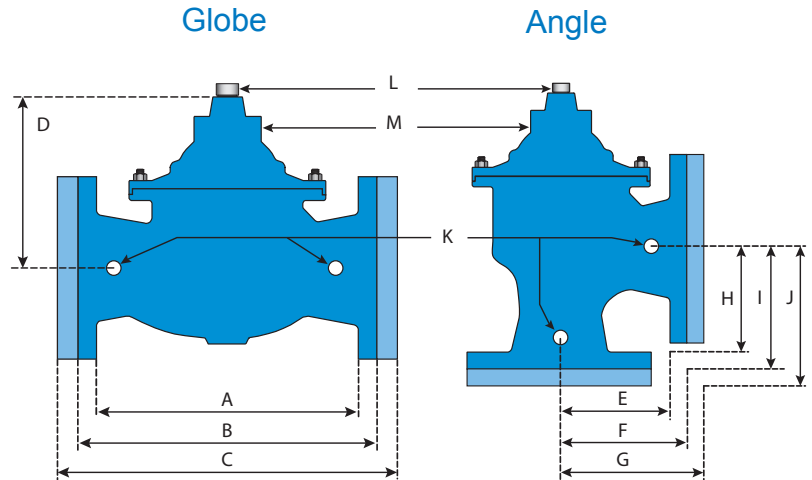
The Watts ACV On-Off Float Control Valve is designed to open fully or close drip-tight as commanded by the Float Control Pilot. The Float Pilot may be either valve or remote mounted. The valve closes drip tight when water level reaches the adjustable high-level setpoint, and opens fully when water level is below the adjustable low-level setpoint, allowing a calculated "draw-down" of water level to increase tank circulation.

The On-Off Float Pilot commands the routing of fluid and pressure into and out of the cover chamber of the main valve. When water level reaches the adjustable high-level setpoint, the Float Pilot connects the cover chamber of the valve to upstream pressure, closing the valve drip tight. The valve remains closed as water level decreases. When water level reaches the adjustable low-level setpoint, the Float Pilot connects the cover chamber of the valve to atmosphere (wet drain), opening the valve fully. High and low levels are separately adjustable by positioning stop collars on the float rod(s) at desired opening and closing setpoints.

If desired, the on-off action of the valve can be "reversed" by modifying the hydraulic connections of the On-Off Float Pilot.

**Materials**

- Body & Cover:** Ductile Iron ASTM A536
- Coating:** NSF Listed Fusion Bonded Epoxy Lined and Coated
- Trim:** 316 Stainless Steel (1-1/4" – 8")  
ASTM B62 Bronze (10")  
(Stainless Steel Optional)
- Elastomers:** Buna-N (standard)  
EPDM (optional)  
Viton (optional)
- Stem, Nut & Spring:** Stainless Steel



**Operating Pressure**

- Threaded = 400 psi
- 150 Flanged = 250 psi
- 300 Flanged = 400 psi

**Operating Temperature**

- Buna-N: 160°F Maximum
- EPDM: 300°F Maximum
- Viton: 250°F Maximum

**Pilot System**

- Float Control**
- Brass (Standard)
- Float Ball**
- Polyethylene (6" dia.)
- Float Rods**
- (2) 12" Rods (Standard)

**Tubing & Fittings**

- Copper / Brass (Standard)
- Stainless Steel (Optional)

**Dimensions**

	A	B	C	D	E	F	G	H	I	J	K	L	M	
VALVE SIZE	GLOBE THRD.	GLOBE 150#	GLOBE 300#	COVER TO CENTER	ANGLE THRD.	ANGLE 150#	ANGLE 300#	ANGLE THRD.	ANGLE 150#	ANGLE 300#	PORT SIZE	PORT SIZE	PORT SIZE	SHIPPING WEIGHTS*
1-1/4	7-1/4	-	-	3-1/2	3-1/4	-	-	1-7/8	-	-	1/4	1/2	1/8	15
1-1/2	7-1/4	8-1/2	9	3-1/2	3-1/4	4	-	1-7/8	4	-	1/4	1/2	1/8	15
2	9-3/8	9-3/8	10	4-15/16	4	4	4-1/4	4	4	4-1/4	1/2	1/2	1/4	35
2-1/2	11	11	11-5/8	7	5-1/2	5-1/2	5-13/16	4	4	4-5/16	1/2	1/2	3/8	65
3	10-1/2	12	13-1/4	7	5-1/4	5-3/4	6-1/8	5-1/4	5-3/4	6-1/8	1/2	1/2	3/8	95
4	-	15	15-5/8	8-5/8	-	6-3/4	7-1/8	-	6-3/4	7-1/8	1/2	1/2	3/8	190
6	-	20	21	11-3/4	-	8-1/2	8-7/8	-	8-1/2	8-7/8	1/2	1/2	1/2	320
8	-	25-3/8	26-3/8	15-3/4	-	11	11-1/2	-	11	11-1/2	1/2	1	1/2	650
10	-	29-3/4	31-1/8	18-3/4	-	14-7/8	15-5/8	-	14-7/8	15-5/8	1	1	1	940

*For larger sizes consult factory*

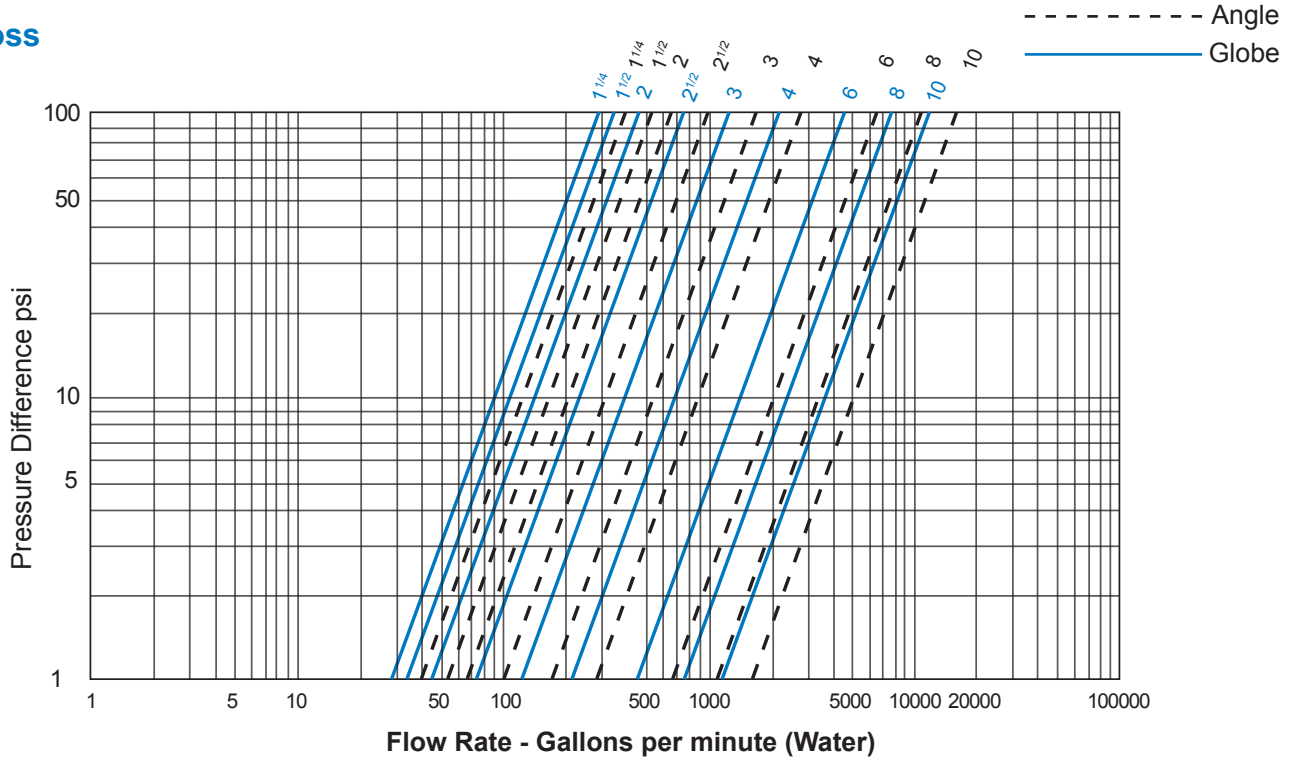
**Valve Cover Chamber Capacity**

Valve Size (in)	1-1/4	1-1/2	2	2-1/2	3	4	6	8	10
fl.oz.	4	4	4	10	10	22	70	-	-
U.S. Gal	-	-	-	-	-	-	-	1-1/4	2-1/2

**Valve Travel**

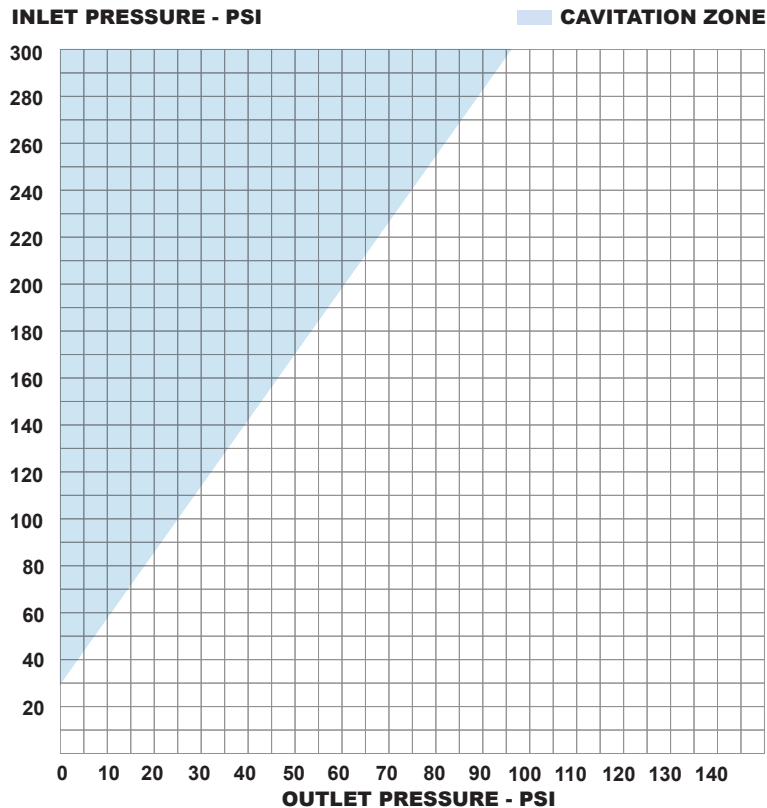
Valve Size (in)	1-1/4	1-1/2	2	2-1/2	3	4	6	8	10
Travel (in)	3/8	3/8	1/2	5/8	3/4	1	1-1/2	2	2-1/2

Headloss



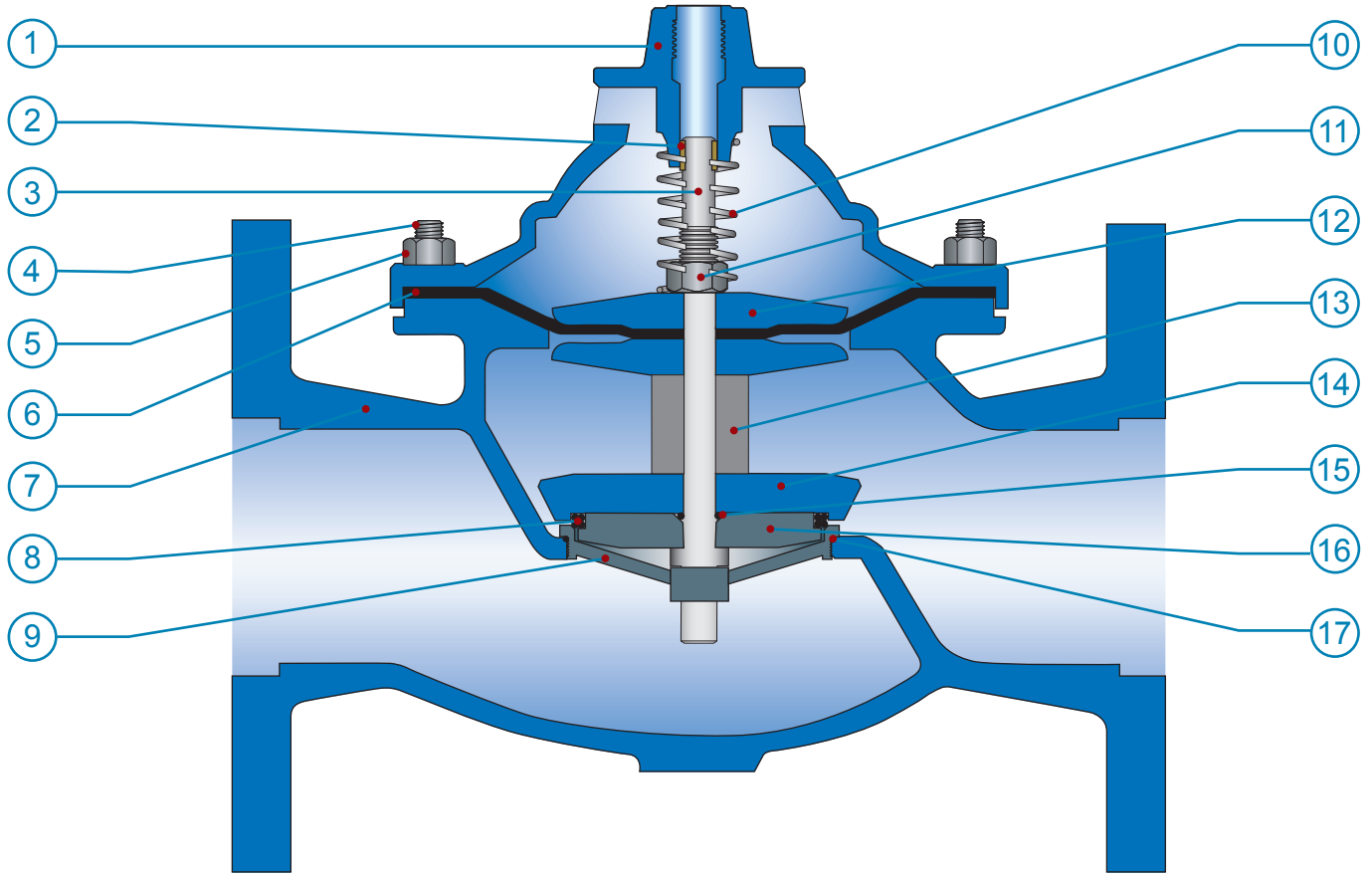
Cavitation Chart

After selecting the valve size, locate inlet and outlet pressures on this chart. If the intersection point falls in the shaded area, cavitation can occur. Operation of valves continually in the cavitation zone should be avoided. Consult Watts ACV for alternatives.



Cross-Sectional Detail

Main Valve



ITEM	DESCRIPTION	MATERIAL
1	Cover	ASTM A536 65-45-12 Epoxy Coated Ductile Iron
2	Cover Bearing	SAE 841 Bronze
3	Shaft / Stem	ASTM A276 304 Stainless Steel
4	Stud	ASTM A570 Gr.33 Zinc Plated Steel
5	Cover Nut	ASTM A570 Gr.33 Zinc Plated Steel
6	<b>Diaphragm*</b>	Buna-N (Nitrile)
7	Body	ASTM A536 65-45-12 Epoxy Coated Ductile Iron
8	<b>Quad Seal*</b>	Buna-N (Nitrile)
9	Seat Ring	ASTM A743 CF8M (316) Stainless Steel (8" and Smaller) ASTM B62 Bronze (10" and Larger)
10	Spring	ASTM A276 302 Stainless Steel
11	Stem Nut	ASTM A276 304 Stainless Steel
12	Diaphragm Washer	ASTM A536 65-45-12 Epoxy Coated Ductile Iron
13	Spacer	ASTM A276 304 Stainless Steel
14	Quad Seal Retainer	ASTM A536 65-45-12 Epoxy Coated Ductile Iron
15	<b>O-Ring*</b>	Buna-N (Nitrile)
16	Quad Seal Plate	ASTM A743 CF8M (316) Stainless Steel (8" and Smaller) ASTM B62 Bronze (10" and Larger)
17	<b>Seat Gasket*</b>	Buna-N (Nitrile)

\* Contained in Main Valve Repair Kit

## Installations

- Prior to installation, flush line to remove debris.
- Install valve horizontally "in line" (cover facing UP), so flow arrow matches flow through the line. Avoid installing valves 6" and larger vertically. Consult factory prior to ordering if installation is other than described.
- Install inlet and outlet isolation valves. NOTE: When using butterfly valves, insure disc does not contact control valve. Damage or improper valve seating may occur.
- Provide adequate clearance for valve servicing and maintenance.
- Install pressure gauge to monitor valve inlet pressure.
- Provide adequate drain for cover chamber discharge. Consult "Valve Cover Capacity" chart on appropriate main valve Engineering Bulletin.
- If On-Off Float Pilot is remotely mounted it should be field connected with 3/8" minimum copper tubing in accordance with factory piping schematic.
- Float Pilot, Rods, and Ball should be mounted in a field installed "stilling well" for protection against surface turbulence and interference.
- Additional 12" Float Rods available. Consult Factory.

## Start-Up

Proper Automatic Control Valve start-up requires bringing the valve into service in a controlled manner. All adjustments to control pilots and speed controls should be made slowly, allowing the valve to respond and the system to stabilize. **NOTE: Control Valves should be set-up in a dynamic (flowing) condition for proper start-up. Provisions for flow must be made to insure proper settings.**

- If Float Control is remote mounted, field installed control lines should be 3/8" minimum copper tubing for distances no greater than 10 feet. For greater distances use 1/2" minimum copper tubing or pipe.
  - Remote mount – without Accelerator (4" and smaller):  
Port 1 = Supply Pressure  
Port C = Valve Cover  
Port 2 = Atmosphere
  - Remote Mount – with Accelerator (6" and larger):  
Port 1 = Atmosphere  
Port C = Accelerator Cover  
Port 2 = Supply
1. Close upstream and downstream valves to isolate the valve from line pressure. Open all Isolation Ball Valves, if so equipped. If valve is fitted with adjustable speed controls, turn needle(s) in (clockwise) until seated, and return out (counterclockwise) 1-1/2 to 2-1/2 turns. These are approximate settings, and should be fine tuned to suit system requirements after level adjustments have been made.
  2. Slowly open upstream isolation valve to allow controlled filling of the valve. Vent entrapped air by carefully loosening control tubing or pipe plug at the highest point possible. If valve is equipped with a Position Indicator, open Air Bleed Petcock to vent air. Water will be milky in appearance and will begin to clear as air is vented. Re-tighten when water vents clearly.
  3. **Setting Float Control:** Install desired number of Float Rods and Low and High Level Stop Collars (less Float). Manually position Float Control to the center point in its travel and balance by positioning Counterweight "in" or "out" until Float Control holds in position. Proper balance is achieved when Float Control moves to the "down/on" or "up/off" position with minimal force or drag. The position of Counterweight on the Counterweight Rod will vary based upon the number and material of Float Rods being used. Install Float.
  4. Position Low and High Level Stop Collars on Float Rods to match desired valve opening and closing levels. Slowly open downstream isolation valve.
  5. Fine tune Speed Controls (if equipped) to suit system requirements. Adjust Closing Speed Control clockwise for slower closure and counterclockwise for faster closure. Adjust Opening Speed Control clockwise for slower opening and counterclockwise for faster opening.

## Specifications

The On-Off Float Control Valve shall be a pilot operated diaphragm valve designed to open fully or close drip-tight as commanded by the Float Control Pilot. The Float Pilot may be either valve or remote mounted. The valve shall close drip tight when water level reaches the adjustable high-level setpoint, and open fully when water level is below the adjustable low-level setpoint, allowing a calculated “draw-down” of water level to increase tank circulation.

The main valve shall be a hydraulically operated, single diaphragm actuated, globe or angle pattern valve. Y-pattern valves shall not be permitted. The valve shall contain a disc and diaphragm assembly that forms a sealed chamber below the valve cover, separating operating pressure from line pressure. The diaphragm shall be constructed of nylon reinforced Buna-N, and shall not seal directly against the valve seat and shall be fully supported by the valve body and cover. Rolling diaphragm construction will not be allowed and there shall be no pistons operating the main valve or any pilot controls.

The main valve body and cover shall be Ductile Iron ASTM A536, and all internal cast components shall be Ductile Iron or CF8M (316) Stainless Steel. All Ductile Iron components, including the body and cover, shall be lined and coated with an NSF 61 Certified Epoxy Coating applied by the electrostatic heat fusion process. All main valve throttling components (valve seat and disc guide) shall be Stainless Steel. The valve body and cover must be machined with a 360-degree locating lip to assure proper alignment.

The disc and diaphragm assembly shall contain a Buna-N synthetic rubber “Quad Seal” that is securely retained on 3-1/2 sides by a disc retainer and disc guide. Diaphragm assemblies utilizing bolts or cap screws for component retention will not be permitted.

The exposed portion of the Quad Seal shall contact the valve seat and seal drip-tight. The disc and diaphragm assembly must be guided by two separate bearings, one installed in the valve cover and one concentrically located within the valve seat, to avoid deflection and assure positive disc-to-seat contact. Center guided valves will not be permitted. All necessary repairs shall be made from the top of the valve while the body remains in line.

Pilot control systems for valves 3” and smaller shall contain a Flow Clean Strainer, On-Off Float Pilot, (2) 12” Float Rods and a Float Ball. Pilot control systems for 4” valves shall contain an On-Off Float Pilot, (2) 12” Float Rods, Float Ball, an external Y-Strainer and Isolation Ball Valves on all body connections. All pilot control systems shall utilize copper tubing and brass fittings regardless of valve size.

The valve shall be Watts ACV Model F110-14 (Globe) or F1110-14 (Angle) On-Off Float Control Valve.

## Other Watts ACV Float Control Valves

F110-10 / F1110-10	Modulating Float Control Valve
F110-13 / F1110-13	Modulating Float Control Valve with Pressure Sustaining Feature
F110-AS / F1110-AS	Modulating Float Control Valve with Solenoid (On-Off) Feature
F110-18 / F1110-18	On-Off Float Control Valve with Pressure Sustaining Feature