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A GUIDE TO THE INSTALLATION, OPERATION AND MAINTENANCE OF

FIRESURE FM

FLOWMETERS IN AUTOMATIC SPRINKLER INSTALLATIONS

FM APPROVED

FLANGE WAFER AND GROOVE TYPES

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1 Specification and Principle of Operation

Firegroove and Fireflange Type

1.1 Introduction

The Firesure flowmeter is a direct reading flowmeter, approved by FM for fire pump testing in automatic sprinkler installations.

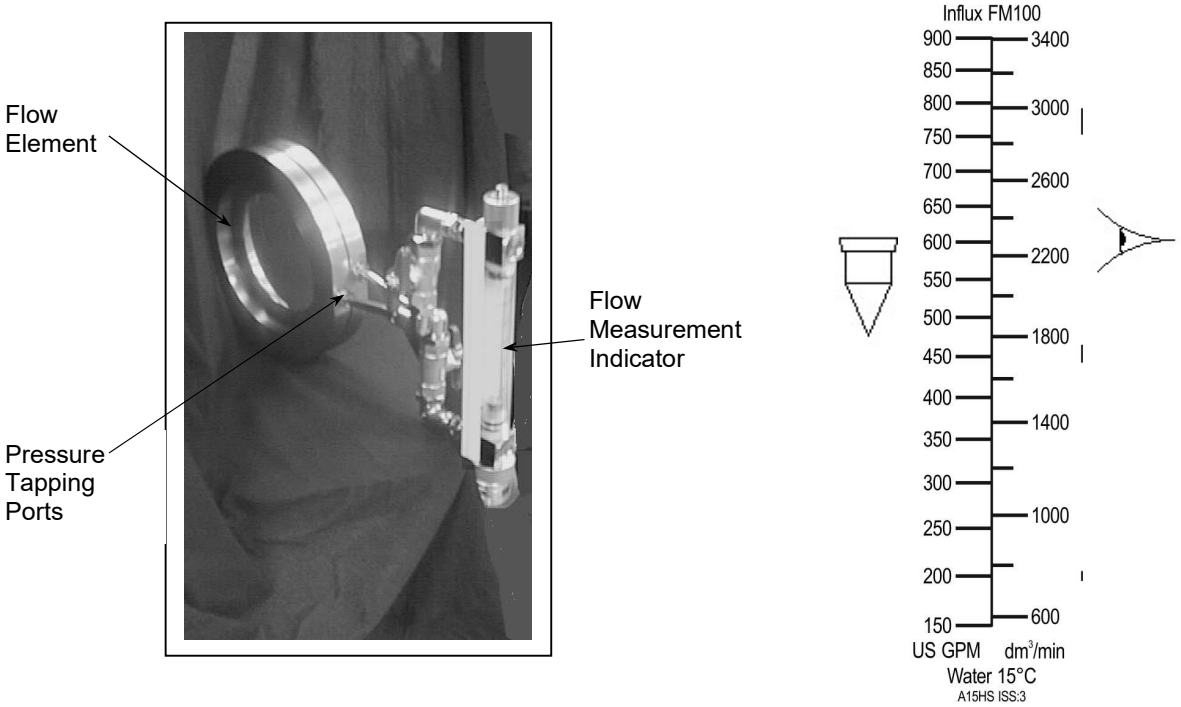
These meters have been approved for installation with gauge glass in the vertical position. There must be at least five diameters of straight pipe upstream and downstream of the orifice plate. The isolating valve on the pressure tappings must be kept closed when the meter is not being used.

1.2 Construction and Specification

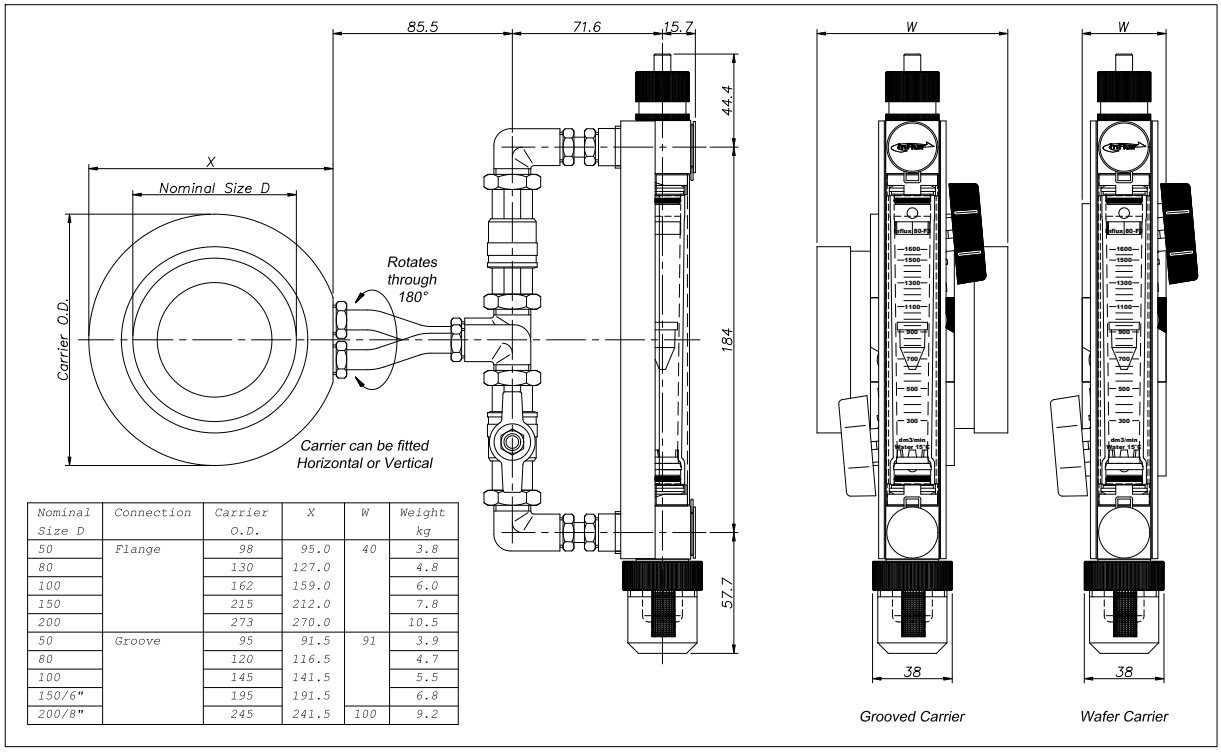
Main Orifice Carrier -	316 stainless steel flow orifice mounted in a polyester coated mild steel carrier
Bypass Flow Indicator -	Nickel-plated copper tubing and brass connections Stainless steel filter element, restrictor rodding and float indicator Boroscilicate glass indicator tube Viton and polyurethane seals
Max Operating Pressure -	20 bar
Max Operating Temperature -	90°C maximum
Connection -	Fireflange - Wafer style bolted between flanges Firegroove – Groove pipe ends using approved pipe couplings

1.3 Principle of Operation

Water flow through the flow element, creates a pressure difference between the two pressure tapping ports. These pressure ports are connected across the indicator, causing a small bypass flow, directly related to the flow through the main orifice. An indicating float positioned within the glass tube can be read against scale markings, which show the flow rate delivery of the installation. The flow indicator is matched to the flow element in order to provide correct readings of pump duty. No attempt should be made to use any of the component parts for other purposes.

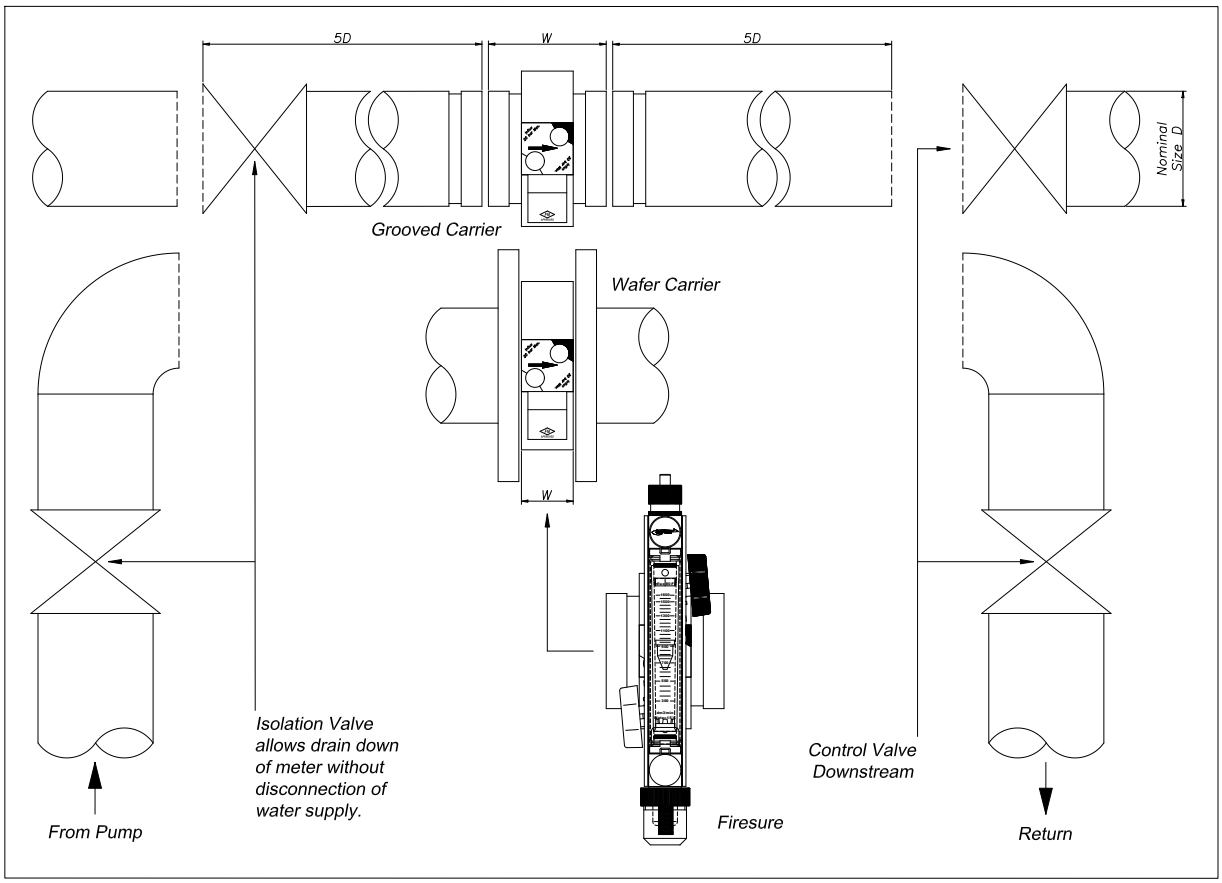


2 Installation



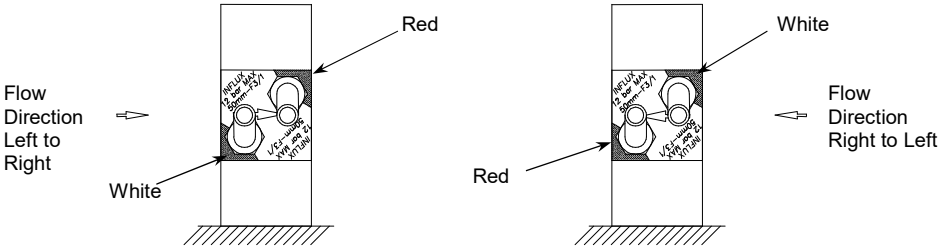
Nominal Size D	Connection	Carrier O.D.	X	W	Weight kg
50	Flange	98	95.0	40	3.8
80		130	127.0		4.8
100		162	159.0		6.0
150		215	212.0		7.8
200		273	270.0		10.5
50	Groove	95	91.5	91	3.9
80		120	116.5		4.7
100		145	141.5		5.5
150/6"		195	191.5		6.8
200/8"		245	241.5	100	9.2

2.1 Pipe Line Configuration



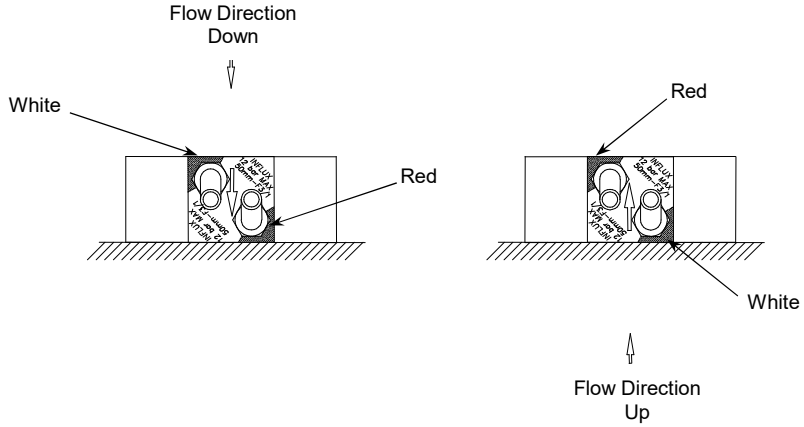
2.2 Main Orifice Carrier Preparation

a) For Horizontal Pipe Work Mounting – Connect joggled connection pipes as shown

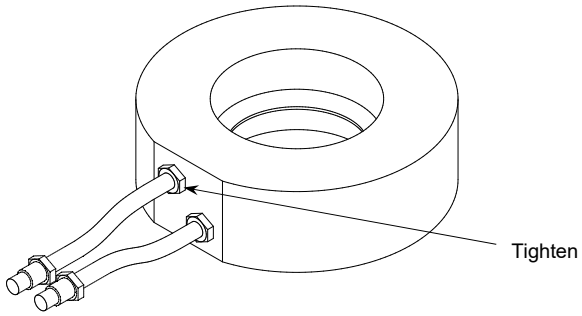


or

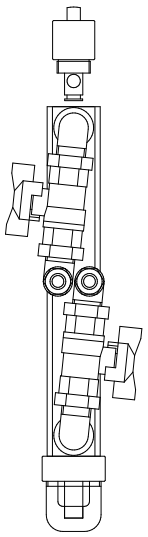
b) For Vertical Pipe Work Mounting – Connect joggled connection pipes as shown



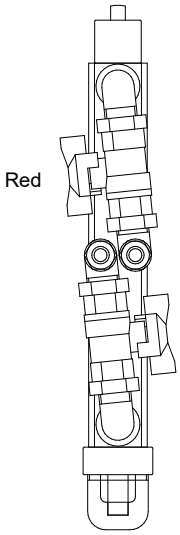
c) Rotate Pipes to Position Shown in a) or b)
Check pipes for horizontal alignment.
Ensure that the pipes spacing matches the rear bypass indicator connections.
Tighten pressure tapping nuts.



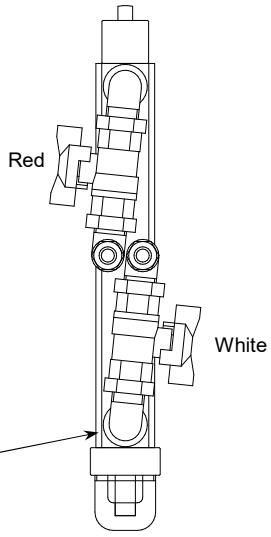
2.3 Connecting the Bypass Indicator



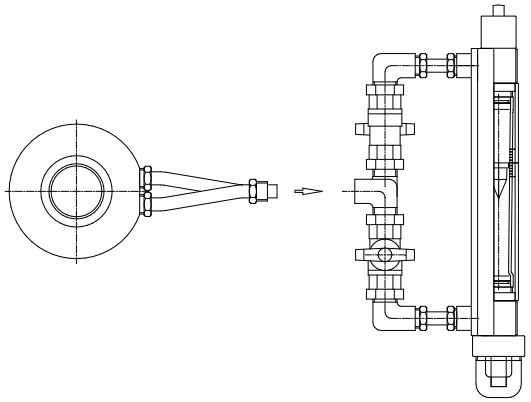
Remove red plastic stop and retaining rod from top block. Remove retaining screw and assemble restrictor and bleed assembly to indicator top block with retaining screw in place.



Rear view of indicator piping **as supplied** suitable for connection to main orifice carrier for horizontal flow right to left or vertical flow upward.

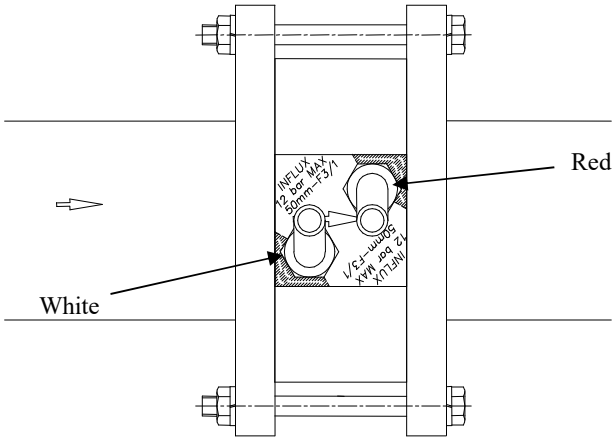


Rear view of indicator **adjusted** and suitable for connection to main flow element for horizontal flow left to right or vertical flow downwards. To adjust loosen nuts, rotate arms to position shown and retighten nuts.



Connect Bypass unit to main flow element ensuring that 'white' marked pressure point connects with 'white' handled tap and 'red' pressure point connects with 'red' handled tap. Tighten connecting nuts, keeping indicator vertical.

2.4 Installation In-Line

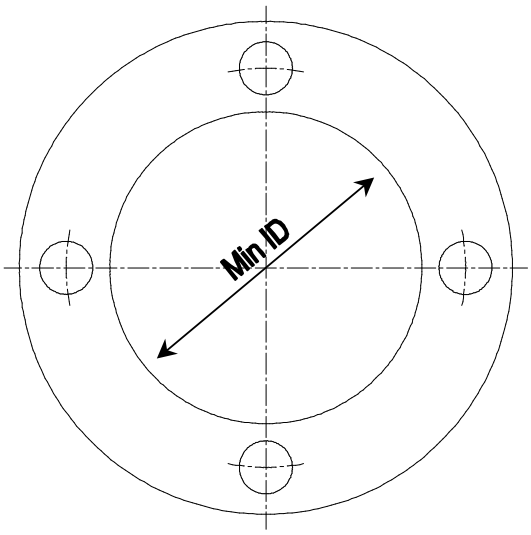


a) Ensure direction arrow is consistent with viewed direction of flow and position **Fireflange** between pipeline flanges concentrically. Concentricity can be achieved by ensuring the flow element outside diameter is central to the fixing bolts.

b) **Firegroove** type should be fitted with approved couplings suitable for groove cut joints.

c) When fitting Fireflange type, ensure that any sealing gaskets do not obstruct the pipe line or carrier bore.

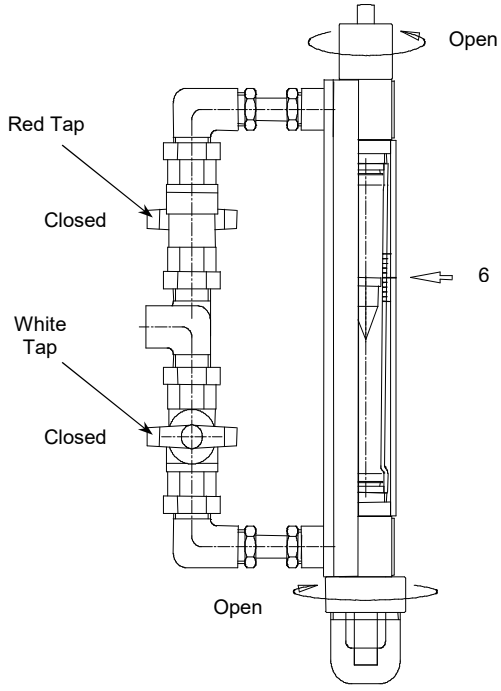
Size/model	Min ID Gasket Permissible
50	53mm
80	79mm
100	103mm
150	155mm
200	204mm



3 Operation

3.1 Flow Testing and Reading

1. With bypass taps in closed position direct flow through meter pipe line.
2. Open bypass indicator taps.
3. Bleed air from bypass by opening bleed assembly one revolution.
4. Close bleed assembly when air is bled.
5. Press restrictor button full home and release.
6. Flow rate is shown by aligning the top of the float with scale markings. Test flows are highlighted on the scale.
7. When test is completed, close bypass taps and drain by opening drain assembly and bleed assembly one turn.
8. Visually check filter bowl. If dirty, remove by unscrewing fully and clean filter element.
9. After draining close filter and bleed assemblies.



Filter and Drain Assembly

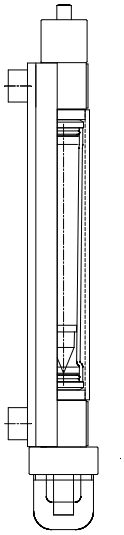
3.2 Fault Checking

Observation	Possible Causes	Remedy
No Flow Indication.	Bypass taps closed.	Open Taps.
	Restrictor clogged.	Press & release restrictor button or remove and visually check restrictor.
	Connections reversed to flow.	Check procedure.
Flow Indication Low.	Restrictor clogged.	As above.
	Filter heavily clogged.	Remove and clean filter.
	Air trapped in bypass.	Bleed air from bypass.
	Main flow element reverse installed	Check flow direction against label arrow.

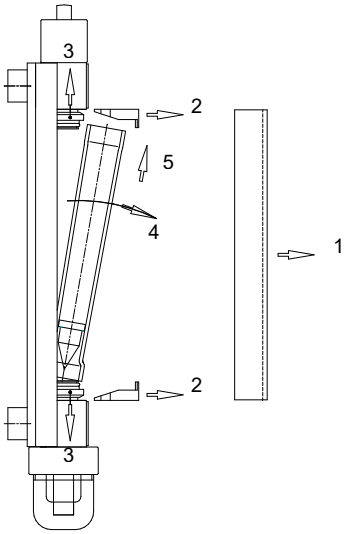
4 Maintenance

4.1 Changing Glass Indicator

In case of breakage a glass tube indicator would be required. Refer first to the printed FM Firesure model number on the flow element label or tube before ordering a replacement.

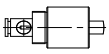
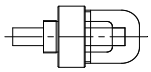
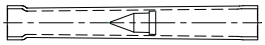


1. Remove Cover
2. Remove Wedges
3. Push inserts back into end blocks
4. Tilt glass out of backplate
5. Assembly is in reverse order.



4.2 Recommended Spares

If the installation and operating procedures are followed there should be no need for maintenance. In the event of accidental damage or loss the following spare parts are available:

		Part No.
Restrictor and bleed assembly		S1000
Filter element and drain		S1001
Glass Tube Indicator		FM80/100/150*/200/8
Seals Kit		S1002

*FM150 should be ordered for FS6FGFM units.

Quality Systems Certificate No. 464
Assessed to ISO 9001:2008