



## Itron Axonic Flow Meter User Guide

[Home](#) » [Itron](#) » Itron Axonic Flow Meter User Guide 

### Contents

- [1 Itron Axonic Flow Meter](#)
- [2 Product Usage Instructions](#)
- [3 GENERAL INDICATIONS](#)
- [4 MOUNTING THE FLOW METER](#)
- [5 Mounting instructions](#)
- [6 ELECTRICAL CONNECTION AND POWER SUPPLY](#)
- [7 Specification of connection to integrator](#)
- [8 FUNCTION CONTROL OF AXONIC](#)
- [9 Documents / Resources](#)
  - [9.1 References](#)
- [10 Related Posts](#)



**Itron Axonic Flow Meter**



## Specifications

- Operating Parameters: Maximal pressure (PMA), Operating temperature
- CE Marks: Approved in environmental class C (Industrial applications)
- Compliance: DIN EN 1434, MID environmental class E2 and M2 (MID 2014/32/EU)
- Body Length: 200mm – 400mm
- Electronic Height: 124mm
- Bolt Circle Diameter: 145mm – 190mm
- Weight: 8.0kg – 20.0kg

## Product Usage Instructions

### Safety Advice

Ensure that the hot water circuits and power supplies are protected by valves or pressure limiting systems to maintain safe operating conditions.

### Mounting the Flow Meter

**Operating Conditions:** Ensure that the operating parameters of the circuit do not exceed the specified maximal pressure and operating temperature.

## Materials and Dimensions

- **Type DN65:** Body Length L1 – 200mm, Electronic Height L2 – 124mm, Weight – 8.0kg (200mm)
- **Type DN80:** Body Length L1 – 300mm, Electronic Height L2 – 124mm, Weight – 9.0kg (300mm)
- **Type DN100:** Body Length L1 – 300mm, Electronic Height L2 – 124mm, Weight – 9.0kg (300mm)
- For complete technical data, refer to the provided table for specific dimensions and weights.

## FAQ

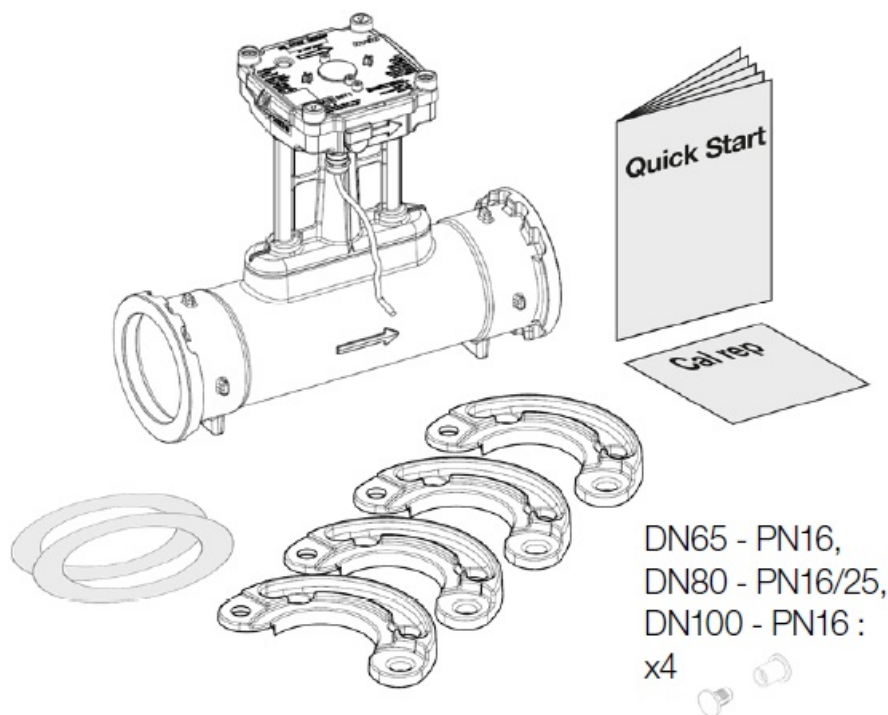
- **Q: What should I do if the operating parameters exceed the specified maximal pressure or temperature?**
  - A: If the operating parameters exceed the specified limits, immediate action should be taken to reduce pressure or temperature to avoid damage to the flow meter.
- **Q: Can the Axonic flow meter be used in both horizontal and vertical positions?**
  - A: Yes, the Axonic flow meter is designed to be used in either horizontal or vertical positions for measuring thermal energy accurately.

## Axonic

### User guide

### DELIVERY AXONIC

- Check completeness before installation
- 1 flow meter incl. connecting cable (l = 3 m or 10 m)
- Moving flanges. (PN16 and PN25 versions only)
- 1 set of gaskets
- 1 mounting and operation instructions
- Calibration Report and CE-Declaration (depending on country)



## GENERAL INDICATIONS

Flow meter AXONIC is a sophisticated electronic measuring instrument for measurement of thermal energy in either horizontal or vertical position. Axonic can be connected to any calculator with compatible signal-input. The following instructions must be carefully observed in order to ensure correct mounting and to fulfill all safety and guarantee conditions.

### Advise concerning safety

Hot water circuits and mains power supplies run under high temperatures and pressure as well as under high voltages.

When operated incorrectly, these may cause serious injuries. Due to this, measuring units may only be installed by qualified and trained personnel. Prior to any installation / de-installation of Axonic it is mandatory to close and empty the concerned network section. The casings of the heat meters are designed for cold, warm and hot water, with the characteristic values specified for each case, excluding any other liquid. If the flow meter casing is submitted to strong shocks, impacts, drops from more than 60 cm height or similar stresses, the heat meter must be replaced. Pipes must be earthed.

The complete system or global installation which will use this equipment must be protected by valve or a pressure limiting system in order to respect the maximal pressure of the equipment.

### CE marks and protective classes

Metering unit AXONIC fulfills all requirements of applicable EC guidelines, and is approved in environmental class C (Industrial applications), according to DIN EN 1434, MID environmental class E2 and M2 (MID 2014/32/EU)

- **Ambient temperature:** -25°C ... +60°C (indoors installation)
- Storage temperature
  - **Permanent:** T°MIN = -25°C T°MAX = 60°C
  - **Max** +70°C (< 24 hours continuous)
- Flow sensor IP 68 (7 days under 1.2 meter of water at ambient)
- Axonic is conform to DIRECTIVE 2014/68/EU (Heat version only), fluid group 2 (Approved for water only).
- Discarded electronic devices contained within must not be put in normal house hold waste. Dispose in accordance to local government regulations.
- The metrological class of a complete thermal energy meter, made of subassemblies (flow meter, calculator and temperature sensors pair), assembled and installed according to the manufacturers installations instructions, meets the metrological class that is indicated on the flow meter type plate.
- Cooling meter versions meet the requirements of MessEV.

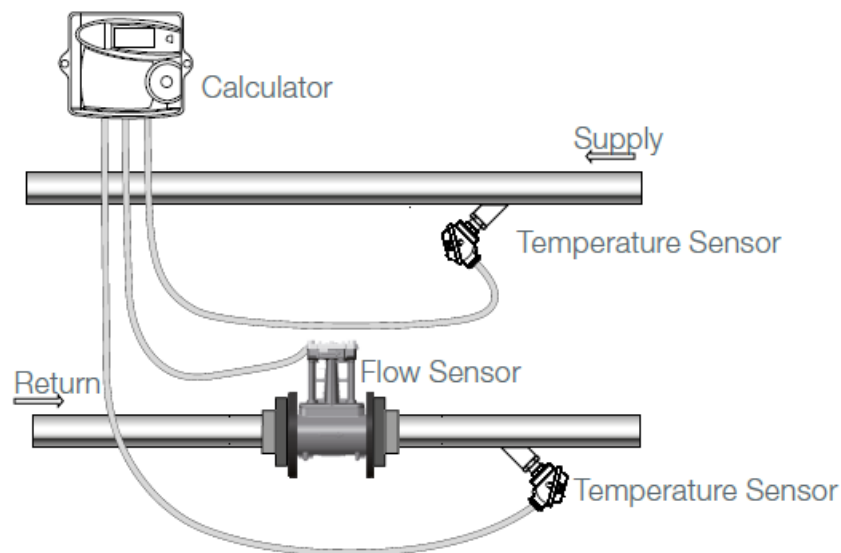
### Further important indications

- The flow meter must never be lifted or carried by its connecting cable.
- Mounting position shall be selected so that the connecting cable of the flow meter and the temperature probe cables will not be near mains cables or other sources of electromagnetic disturbances (minimum distance 50 cm).
- Cables must not be installed along pipes reaching temperatures above 60 °C.
- Opening of calibration seals will cause the loss of calibration validation and of guarantee.
- Unsealing the device is excluding the guarantee of conformity to directive PED 2014/68/EU. (Heat version only)
- The casing may only be cleaned on the outside, with a soft, damp cloth. Do not use detergents.
- Installation must be carried out according to EN 1434.
- There may be local rules that must be followed but not covered with this manual. Please check with the experts of the country in which the meter will be installed.
- In Bi-Functional applications, the durability of the flow sensor is limited to 5 years.

### Application

The flow meter Axonic is a sub-assembly for a thermal energy measurement systems that consists of flow meter, calculator (e.g. Itron CF51, CF55, CF800) and a pair of temperature sensors. Calculator input specifications and flow meter output specification must be compliant in order to ensure correct energy measurement, this concerns in

particular flow meter pulse-weight (L/pulse) and flow meter position (return or supply pipe).



#### Information on the appropriate disposal of products

The crossed-out garbage container symbol on the device or on the packaging indicates that the old product must be disposed of separately from household waste so that it can be handled and disposed of properly. Please observe the laws in force in your country regarding the return and proper disposal of electrical devices. The product is potentially not harmful to human health and the environment, but if it is illegally disposed of in the environment, it will have a negative impact on the ecosystem. Illegal disposal of the device in the environment is punishable by law.

It is the personal responsibility of the user of the meter, if necessary, to delete his private data before disposal.

## MOUNTING THE FLOW METER

### Operating conditions, materials and dimensions

The operating parameters of the heating or cooling circuit must not exceed, Maximal pressure (PMA), Operating temperature indicated on type plate.

- Max permanent operating temperature: version for heat 130°C/150°C (permanent/accidental); version for cooling 50°C
- PMA at extreme temperatures
  - **PN16 120°C < Maximal pressure:** 15.2 bar < 130°C
  - **PN25 120°C < Maximal pressure:** 23.8 bar < 130°C

Minimum pressure to avoid internal cavitation

- DN65-100
  - For fluid temperature < 90°C: minimum pressure = 1 bar
  - For fluid temperature ≥ 90°C: minimum pressure = (minimum pressure to keep water at liquid state) + 1 bar
- DN125-150
  - For fluid temperature < 90°C: minimum pressure = 2bar
  - For fluid temperature ≥ 90°C: minimum pressure = (minimum pressure to keep water at liquid state) + 1,5

bar

Raw materials in contact with water

- **O-Ring:** EPDM (channel) & FKM
- **Bodies:** Bronze (PN16 and 25), stainless steel (PN40).
- **Transducer support:** brass plated (PN16 and 25), Stainless steel (PN40)
- **Measurment Channel, Stabilizer:** Thermoplastic
- **Membrane:** stainless steel

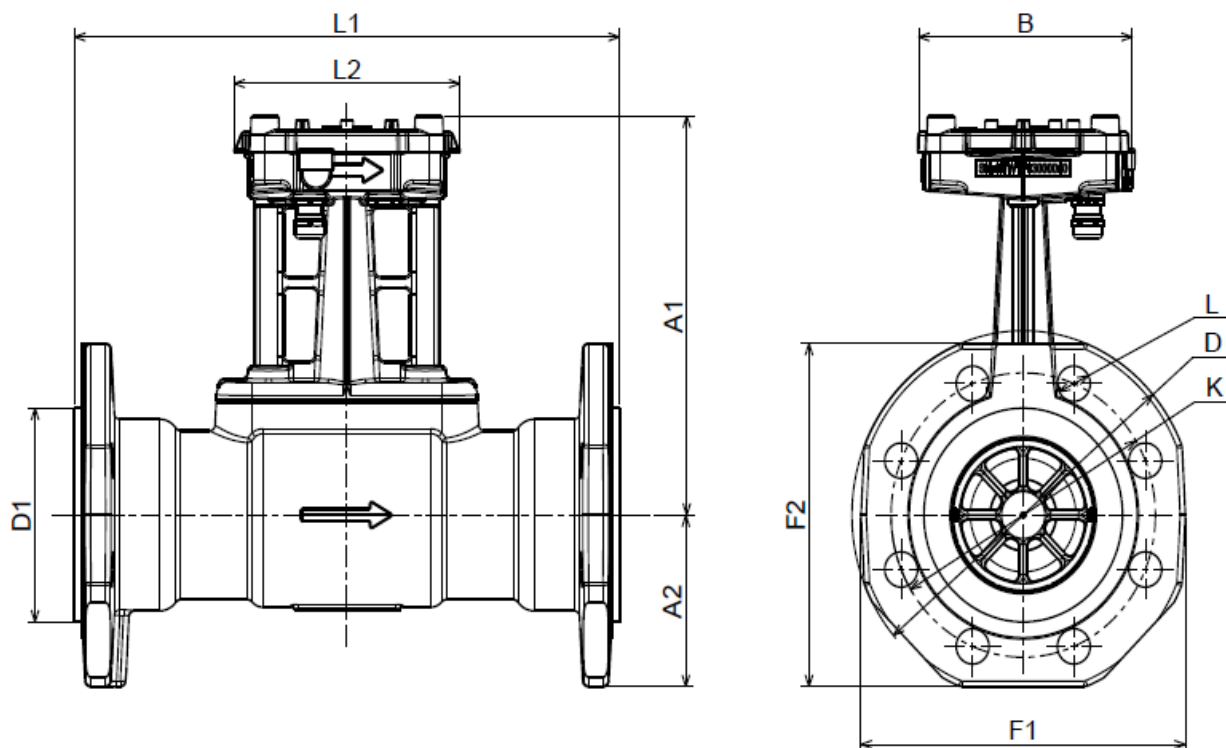
**Pressure loss: at qp/50°C (bar)**

- DN65 < 0.10 bar
- DN80 < 0.17 bar
- DN100 < 0.13 bar
- DN 125 < 0.22 bar
- DN150 < 0.15 bar

For further technical data, refer to table

Type			DN65 qp25			DN80 qp40			DN100 qp60			DN125 qp100	DN150 qp150		
			PN16	PN25	PN40	PN16	PN25	PN40	PN16	PN25	PN40	PN16	PN16	PN25	PN40
Body Length (available versions)	L1	mm	200	300	300	200	300	350	250	360	400	250	300	500	300
			300			225			360				500		
						300			400						
						350									
Electronic	L2	mm	124	124	124	124	124	124	124	124	124	124	124	124	124
	B	mm	119	119	119	119	119	119	119	119	119	119	119	119	119
Height	A1	mm	204	204	204	209	209	209	219	219	219	219	244	244	244
	A2	mm	93	93	88	100	100	100	111	118	112	94	143	150	144
Bolt Circle Diameter	K	mm	145	145	145	160	160	160	180	190	190	210	240	250	250
Bolt holes Diameter	L	mm	19	19	18	19	19	18	20	23	22	20	24	28	26
Number of holes			4	8	8	8	8	8	8	8	8	8	8	8	8
Flange Dimensions	D	mm	185	185	188	200	200	203	220	235	238	250	285	300	300
	D1	mm	108	108	109	128	128	120	156	156	149	184	216	216	203
	F1	mm	-	-	178	-	-	194	-	-	228	-	-	-	288
	F2	mm	-	-	175	-	-	190	-	-	224	-	-	-	288
Weight (length)		kg (mm)	8,0	9,0	10,5	9,3 (200)	10,4	14,0	13,0	16,0	20,0	11,8 (250)	24,0	31,0	32,0
			(200)	(300)	(300)	9,6 (225)	(300)	(350)	(250)	(360)	(400)		(300)	(500)	(300)
			9,0			10,4			14,0				28,0		
			(300)			(300)			(360)				(500)		
						10,9			15,0						
						(350)			(400)						

- Flanges PN16 and PN25 according EN 1092-2 / Mobile Flanges Elevated interface type B
- Flanges PN40 according EN 1092-1 / Type 21 PN40 Male hubbed socket Type E



## Mounting instructions

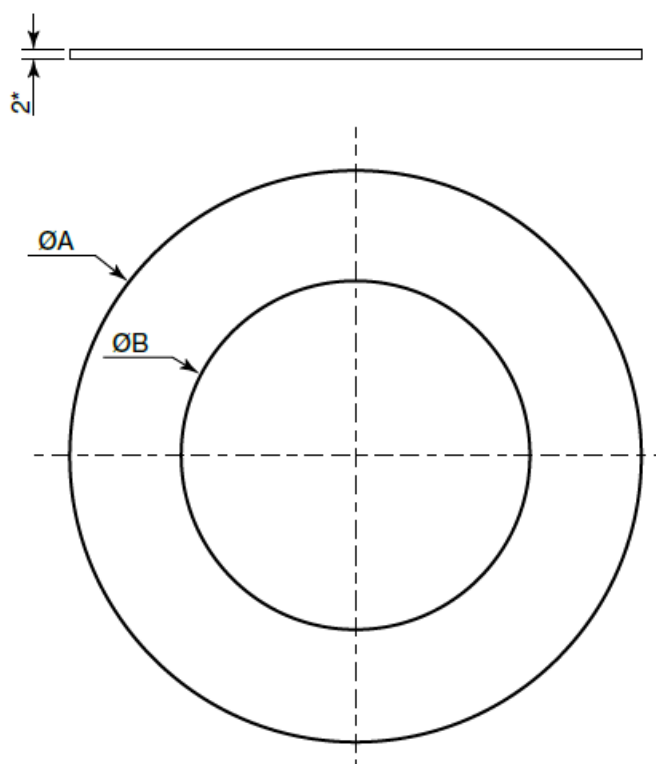
- Never carry out welding or drilling work near the meter.
- All handling operations must be made with the lifting ear of the product. If there are no lifting ear, handling operations can be made by hand.
- Leave the meter in its original package until all connection, insulating, painting and cleaning tasks have been performed.
- Always install the meter according to the mounting position indicated on the nameplate of the calculator (supply or return or cold or warm line). It is recommended that stop valves are fitted before and after the flow sensor to simplify dismantling.

The flow sensor should be installed in a convenient position for service and operating personnel.

- The flow sensor can be installed in both horizontal and vertical pipe sections, any position is allowed.
- Aluminum rib of electronic compartment should be visible in case of thermal insulation. (See Fig N°1)
- For medium temperatures above 130°C a flow meter with thermal insulation must be installed in that way, that the electronic is beside the pipe and not above. (See Fig N°2)
- Ensure that the flow sensor is always filled with liquid after installation. (See Fig N°3)
- By approval calming sections before and after the flow sensor are not required. Nevertheless we recommend to design calming sections 5xDN if the space for installation is available.
- The heat meter must be protected against shocks and vibrations which might occur at the place of installation.
- When charging the pipes with water, isolation valves must be opened slowly.
- Flange connections of the meter must match with the nominal diameter DN and nominal pressure PN (according to EN 1092) of the corresponding counterparts of the pipes. The metering unit must not be subject to excessive tensions caused by pipes or molded parts. The pipes of the heating system must be secularly fastened before and after the flow meter. In case of flanged connections, all bolts must be used and tightened. All bolts, nuts and gaskets used must comply with the nominal with DN, the pressure level PN, the maximum admissible temperature and pressure.

- Installation of AXONIC. Versions PN16 and PN25 with dedicated seat of moving flanges. (See Fig N°4)
- CF 51 and CF 55 calculators can be attached to the flowmeter using the adapter supplied with the flowmeter. (See Fig N°5)
- For repair or reconditioning flow meter have to be sent back to the manufacturer or to a repair shop authorised by the manufacturer.
- The device must be replaced in case of fire, explosion at its close proximity.
- Keep the cable length as short as possible.

## Gaskets



DN	PN	Reference	Type	ø A	ø B
65	16-25	A4003392	IBC	127	77
	40	A4003393	SR	109	
80	16-25	A4003441	IBC	142	89
	40	A4003442	SR	120	
100	16-25	A4003443	IBC	168	115
	40	A4003444	SR	149	
125	16-25	A5007686	IBC	194	141
150	16-25	A4003446	IBC	224	169
	40	A4003447	SR	203	

Thickness following NF EN 1514-1 and in accordance with the supplier



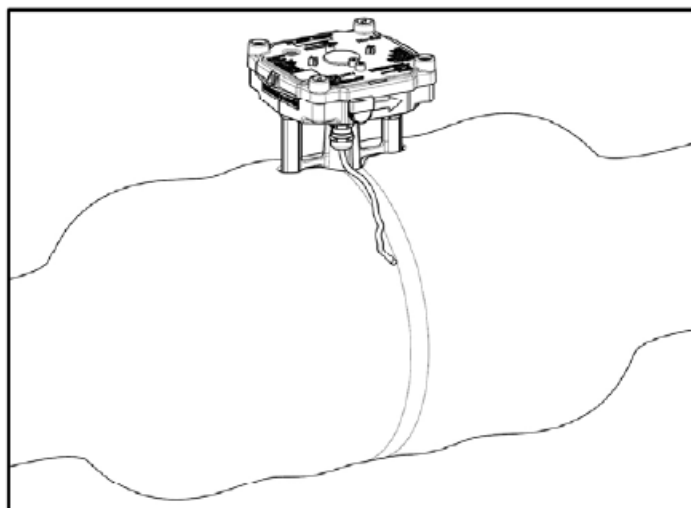


Fig N°1: max thermal insulation level

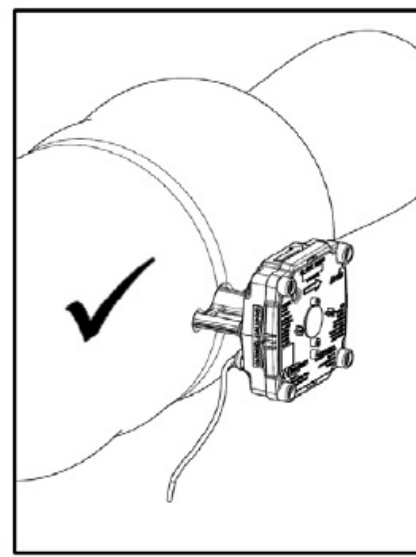
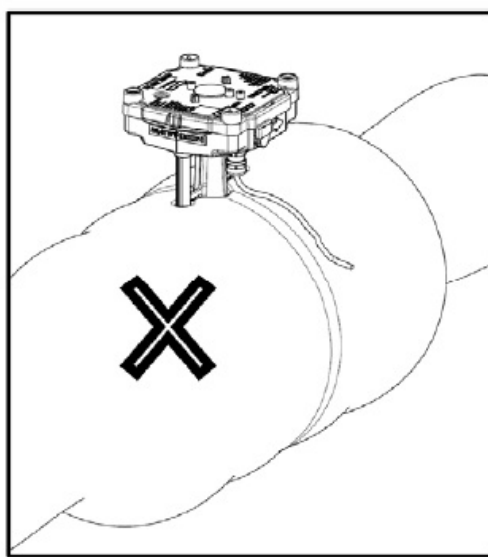
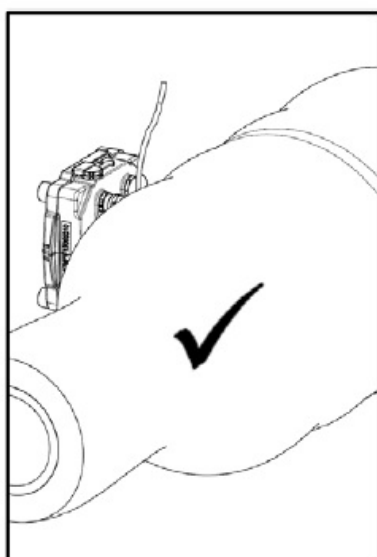
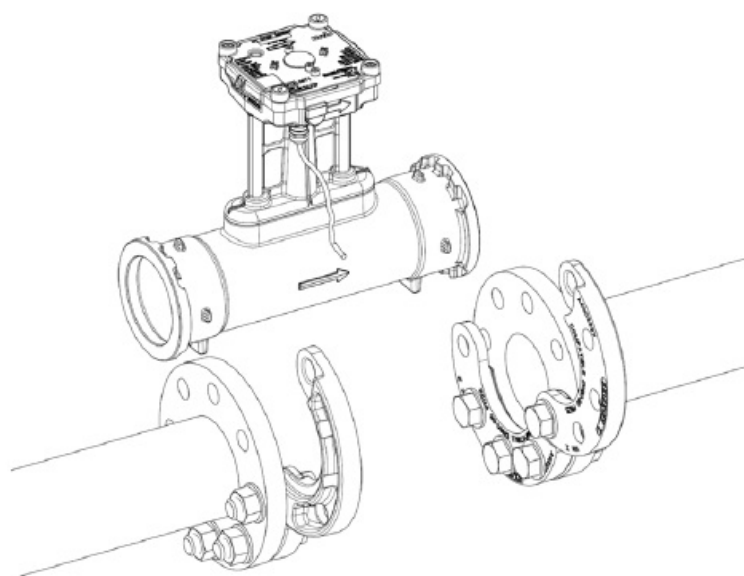
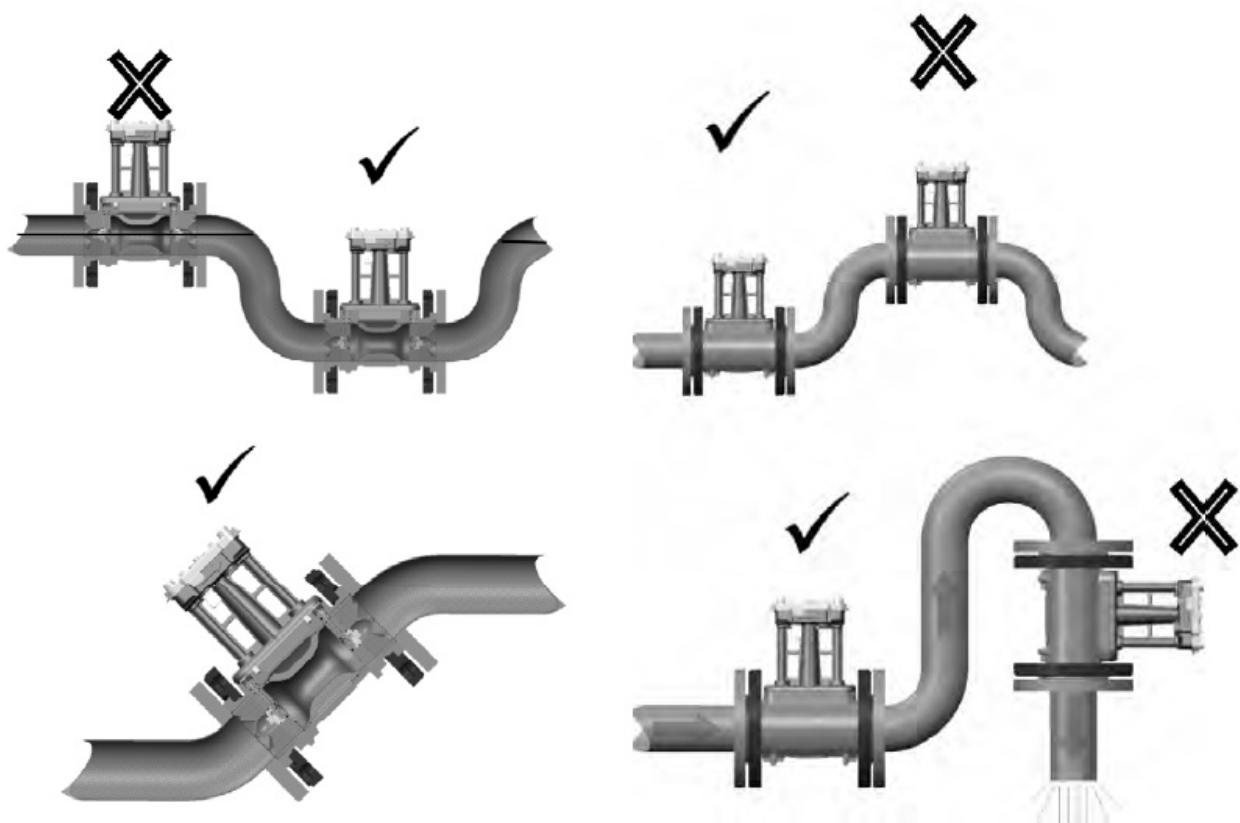


Fig N°2: 130°-150°C with thermal insulation



DN65 - PN16,  
DN80 - PN16/25,  
DN100 - PN16 :  
x4

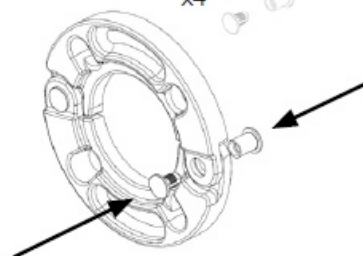


Fig N°4: Installation AXONIC with moving flanges

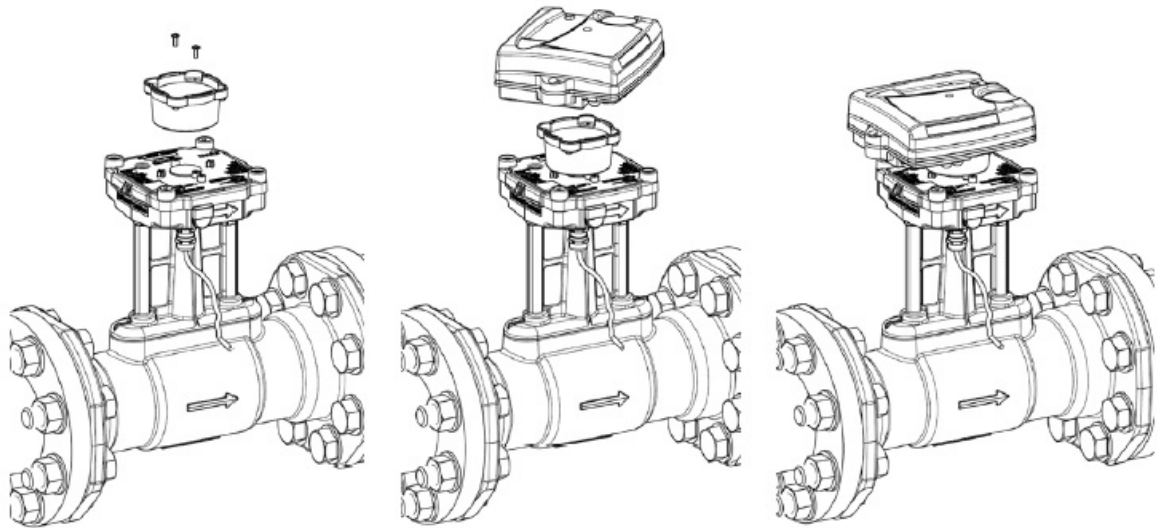


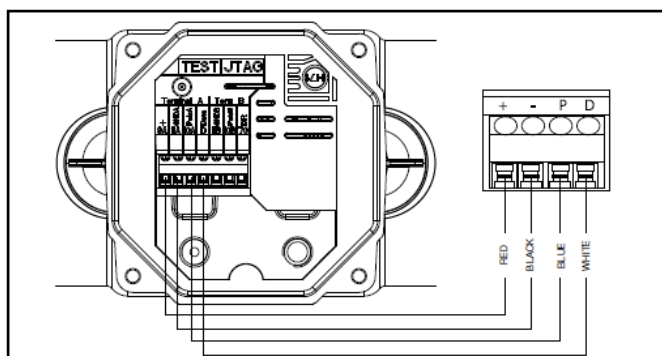
Fig N°5: Mounting of an Itron integrator CF51/CF55 onto AXONIC

## ELECTRICAL CONNECTION AND POWER SUPPLY

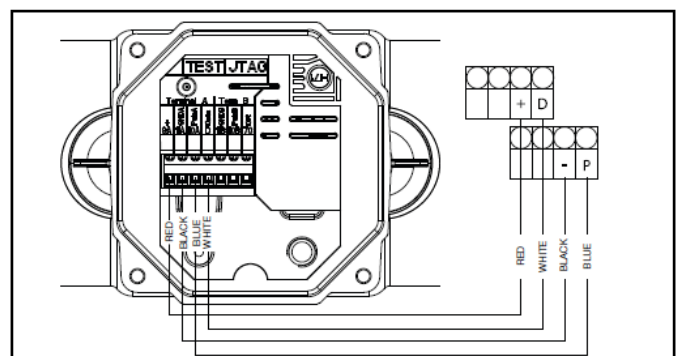
AXONIC must be power-supplied by the integrator (CF 51, CF 55 or CF 800) or an exterior power supply. (eg: Itron Pulse-Box or other integrator with galvanic insulation).

### Connecting the flow meter to integrator unit

- Beside the main pulse output A the product could offer (as option) a 2nd pulse output B providing pulses and backflow to another independent device (e.g regulator). This option would be configured at factory.
- This pulse output B is following the same hardware specification as output A. Pulse-weight and pulse length of output A and B are independent.
- Before connecting, make sure the pulse weights of flow meter and integrator are equal (typeplate of both devices)!
- Connect to integrator according to the following connecting diagram (figures show connecting diagram for CF 51, CF 55, Pulse-Box and CF 800).
- Before connecting an Axonic to other Systems to other systems make sure that a galvanic insulation is guaranteed. (e.g. by using the Itron Pulse-Box)



Connection AXONIC/CF51-CF55-Pulse-Box



Connection AXONIC/CF800

Always make sure that the housing and gasket line up properly.

### Specification of connection to integrator

Cable A: 4 wires connecting cable, used for connection to integrator

#### Allocation of wire colors

1. **WHITE:**  $\mu$ Com/diagnostic
2. **BLUE:** pulse A or diagnostic
3. **BLACK:** earth connection (-)
4. **RED:** power supply AXONIC (+)

Cable B: 3 wires connecting cable, used for connection to any devices

#### Allocation of wire colors

- **RED:** Pulse B
- **BLACK:** earth connection (-)
- **WHITE:** DIR. (Direction of the flow: 1 = normal flow, 0 = backward flow)

#### Characteristic of pulse outputs (A+B)

- conform to class OB, OC and OD of EN1434-2
- **Type:** Open Drain
- **Polarity:** non reversible (observe connection diagram)
- **Duration of pulse:** see table below
- **Max voltage:** 30V DC
- **Max current:** 27 mA
- **Drop of voltage when switched on:**  $\leq 0.3V$  at 0.1 mA /  $\leq 2V$  at 27 mA
- **Max output frequency:** 128 Hz
- **Resistance when switched off:**  $\geq 6M\Omega$
- Pulse length according table
- **Max. cable length:** 10 m

DN65 – qp 25 DN80 – qp 40 DN100 – qp 60 DN125 – qp 100 DN150 – qp 150

Pulse Weight

Pulse Length (ms)

8	p/L	5	n.a.	n.a.	n.a.	n.a.
4	p/L	n.a.	5	n.a.	n.a.	n.a.
2	p/L	n.a.	n.a.	5	n.a.	n.a.
1	L/p	20	20	10	5	5
2,5	L/p	50	50	20	10	10
10	L/p	100** (200, 500)	100** (200)	100	50	50
25	L/p	100** (200, 500)	100** (200, 500)	100** (200)	100** (200)	100
100-2500	L/p	100** (200, 500)	100** (200, 500)	100** (200, 500)	100** (200, 500)	100** (200, 500)

## Power supply

- **Nominal voltage:** 3,2 ... 6V DC
- **Average current consumption:** < 50  $\mu$ A. (depends on product configuration)
- **Peak current consumption I<sub>max</sub>:** < 3 mA

## Optional connecting AXONIC with Pulse-Box to integrator unit (optional power supply)

The Pulse-Box offers the following functions

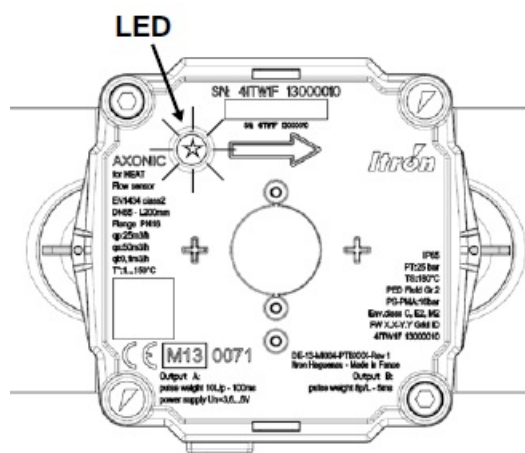
- Power supply of AXONIC independently of the integrator.
- Galvanic insulation of AXONIC from the integrator.
- Pulse length increase of AXONIC's pulses.
- 2 wire pulse output

Before connecting, make sure that the pulse of AXONIC and integrator match!

Connection of AXONIC with Pulse-Box to an integrator according to mounting instructions: respect polarities!

Characteristics of pulse exit

- **Version:** Open collector
- **Polarity:** non reversible (respect connecting diagram)
- **Duration of impulse:** 135  $\pm$  35 ms
- **Maximum input voltage:** 30 V DC
- **Max. input current:** 27 mA
- **Voltage drop when switched on:**  $\leq$  0.3 V at 0.1 mA,  $\leq$  2.0 V at 27 mA
- **Resistance when switched off:**  $\geq$  6 M $\Omega$
- **Maximum pulse frequency:** 1Hz
- **Maximum cable length:** 10 m



## FUNCTION CONTROL OF AXONIC

The AXONIC flow sensor is equipped with a LED in order to perform a simple functional check. The signal sequence depends on operation conditions and will be repeated any 10 as follow

Information	Number of flashes	Signal/Period (Repetition)
Flow detected	1	20ms (LED ON) / 10s
Air in pipe / US Asic alarm	2	20/500ms (LED ON/OFF) / 10s
Low signal amplitude alarm	3	20/500ms (LED ON/OFF) / 10s
Max flow alarm	4	20/500ms (LED ON/OFF) / 10s
Back flow alarm	5	20/500ms (LED ON/OFF) / 10s
Product in test mode	Permanent flashing	20/500ms (LED ON/OFF) / permanent
Product configuration un-locked	Flash sequence as above 1...5, but inverted	500/20ms (LED ON/OFF) / 10s
Product configuration corrupt	Permanent ON	Permanent (LED ON)

### • Function control at the calculator

A functional control and plausibility check shall be done by observing the indications of flow rate and volume index, see calculators manual and operating instructions.

### • Putting into operation


After successful functional test AXONIC is now ready for use and final technical inspection.

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## Documents / Resources

 <p><b>Axonic</b></p> <p> <ul style="list-style-type: none"> <li>1. Einleitung</li> <li>2. Beschreibung und Funktionsweise</li> <li>3. Technische Daten</li> <li>4. Installation</li> <li>5. Bedienung</li> <li>6. Wartung</li> <li>7. Fehlerbehebung</li> <li>8. Sicherheitshinweise</li> <li>9. Sonstiges</li> <li>10. Impressum</li> </ul> </p>	<p><a href="#">Itron Axonic Flow Meter</a> [pdf] User Guide</p> <p>Axonic Flow Meter, Axonic, Flow Meter, Axonic Meter</p>
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## References

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