AquaMaster4

Electromagnetic flowmeter flanged sensor



The ideal flowmeter for potable water distribution networks, revenue metering and irrigation applications

Measurement made easy

Harness the power of electromagnetic flowmeters

Introduction

AquaMaster4 flanged sensors are a range of high performance electromagnetic flowmeter sensors for the measurement of electrically-conductive fluids and are normally supplied as factory-configured, calibrated systems.

This publication provides end-user details for the AquaMaster4 flanged sensor range.

For more information

Further publications for AquaMaster4 are available for free download from http://new.abb.com/products/measurement-products

Contents

1 Health & Safety 4
Document symbols 4
Safety precautions 4
Intended use 4
Improper use 4
Potential safety hazards 5
FEW4 AquaMaster4 sensor – electrical 5
Safety standards 5
Waste Electrical and Electronic Equipment (WEEE) . . . 5
Product recycling and disposal (Europe only) 5
Information on ROHS Directive 2011/65/EU (RoHS II) and 2015/863 (RoHS III) 6
Product symbols 6

2 Sensors overview 7
R-series | reduced bore 7
V-series | octagonal bore 7
F-series | full bore 8

3 Product identification 10
Nameplate – FEW41X/FEW43X 10
Integral transmitter 10
Remote sensor 10
Nameplate – FEW45X 11
Integral transmitter 11
Remote sensor 11

4 Transport and storage 12
Inspection 12
Transport 12
Flanged sensors ≤ DN 450 12
Flanged sensors ≥ DN 450 12
Storing the sensor 12
Storage temperature 12

5 Installation 13
General information 13
Installation requirements 13
Lay lengths 13
Unpacking the sensor 13
Fluid level 13
Pipeline support 14
Extremes of temperature 14
Seal materials / fluid temperatures 14
Pipeline forces / torque 14
Spillage onto the sensor 14
Flow direction / straight pipe requirements . . 15
Electrode axis 15
Localized heating / welding 16
Environmental rating 16
Gasket fitting 16
Cable routing 16
Burying a sensor 17
Sensor separation 17
Dimensions 18
R-style sensor – DN 40 to DN 300 (1½ to 12 in.) 18
R-style sensor – DN 350 to DN 600 (14 to 24 in.) 20
V-style sensor – DN 40 to DN 200 (1½ to 8 in.) . 22
F-style sensor – DN 250 to DN 400 (10 to 16 in.) 24
F-style sensor – DN 450 to DN 600 (18 to 24 in.) 26
F-style sensor – DN 700 to DN 2400 (28 to 96 in.) 28
…F-style sensor – DN 700 to DN 2400 (28 to 96 in.) 30
…F-style sensor – DN 700 to DN 2400 (28 to 96 in.) 32
Grounding 34
Cathodic-protected systems 34
Connections 35
Signal cable preparation 35
Signal cable connection – remote sensors 35
Environmental protection 35

6 Commissioning 36
Safety instruction 36
Checks prior to commissioning 36

7 Repair 36
Spare parts 36
Common accessories 36

8 Recycling and disposal 37
Disassembly 37
Disposal 37

9 Specifications 38
Reduced bore sensor 38
Full bore sensor 41

10 Appendix 45
Declarations of conformity. 45

1 Health & Safety

Document symbols

Symbols that appear in this document are explained below:



DANGER – SERIOUS DAMAGE TO HEALTH
This symbol in conjunction with the signal word 'DANGER' indicates an imminent electrical hazard. Failure to observe this safety information will result in death or severe injury.



WARNING – BODILY INJURY
This symbol in conjunction with the signal word 'WARNING' indicates a potential electrical hazard. Failure to observe this safety information will result in death or severe injury.



CAUTION – MINOR INJURIES
This symbol in conjunction with the signal word 'CAUTION' indicates a potentially dangerous situation. Failure to observe this safety information may result in minor or moderate injury. The symbol may also be used for property damage warnings.

IMPORTANT (NOTE)
This symbol indicates operator tips, particularly useful information or important information about the product or its further uses. The signal word 'IMPORTANT (NOTE)' does not indicate a dangerous or harmful situation.

Safety precautions

Be sure to read, understand and follow the instructions contained within this manual before and during use of the equipment. Failure to do so could result in bodily harm or damage to the equipment.



WARNING – BODILY INJURY
Installation, operation, maintenance and servicing must be performed:

- by suitably trained personnel only
- in accordance with the information provided in this manual
- in accordance with relevant national and local regulations

Intended use

This sensor is intended for the following uses:

- To measure the volumetric flow rate, flow velocity, volume flow (forward, reverse and net) and pressure (option) of a conductive fluid.

The sensor has been designed for use exclusively within the technical limit values indicated on the identification plate and in the data sheets.
In terms of the measuring medium, observe following points:

- Wetted parts such as measuring electrodes, liner, grounding electrodes, grounding rings, protection flanges must not be damaged by the chemical and physical characteristic of the measuring medium.
- The information on the name plate must be observed.

Improper use

The following are considered to be instances of improper use of the sensor:

- For operating as a flexible adapter in piping – for example, compensating pipe offsets, pipe vibrations, pipe expansions.
- For use as a climbing aid – for example, for mounting purposes.
- For use as a support – for example, external loads or as a support for piping.
- Material application – for example, by painting over the nameplate or welding / soldering on parts.
- Material removal – for example, by spot drilling the housing.

Potential safety hazards

FEW4 AquaMaster4 sensor – electrical

WARNING – BODILY INJURY
To ensure safe use when operating this equipment, the following points must be observed:

- Up to 240 V AC may be present. Be sure to isolate the supply before removing the terminal cover.
- Normal safety precautions must be taken to avoid the possibility of an accident occurring when operating in conditions of high pressure and / or temperature.

Safety advice concerning the use of the equipment described in this manual or any relevant Material Safety Data Sheets (where applicable) can be obtained from the Company, together with servicing and spares information.

Safety standards

This product has been designed to satisfy the requirements of IEC61010-1:2010 3rd edition 'Safety Requirements for Electrical Equipment for Measurement, Control and Laboratory Use' and complies with NIST and OSHA.

This equipment complies with the requirements of CEI/IEC 61010-1:2010 'Safety Requirements for Electrical Equipment for Measurement, Control and Laboratory Use' and complies with Occupational Safety & Health Administration.
If the equipment is used in a manner NOT specified by the Company, the protection provided by the equipment may be impaired.

Waste Electrical and Electronic Equipment (WEEE)

WEEE EU Directive 2012/19/EU covers disposal and recycling of electronic equipment at the end of life for reasons of environmental protection.

For industrial installations, portable equipment is included. This means that when the AquaMaster4 transmitter is used with a remote sensor, it is included in directive's scope and has the WEEE symbol (left) on its data label. Therefore, at the end of life, contact the supplier for specialist waste recycling. It must not be disposed of as municipal waste.

Permanent industrial installations are not designated within this directive for recycling. At the point of supply the intended use is not always known, so the WEEE symbol is included on all remote forms of the AquaMaster4 transmitter.

Product recycling and disposal (Europe only)

Electrical equipment marked with this symbol may not be disposed of in European public disposal systems after 12 August 2005. To conform to European local and national regulations (EU Directive 2012/19/EU), European electrical equipment users can now return old or end-of-life equipment to the manufacturer for disposal at no charge to the user. ABB is committed to ensuring that the risk of any environmental damage or pollution caused by any of its products is minimized as far as possible.

IMPORTANT (NOTE)
For return for recycling, please contact the equipment manufacturer or supplier for instructions on how to return end-of-life equipment for proper disposal.

… 1 Health & Safety

Information on ROHS Directive 2011/65/EU (RoHS II) and 2015/863 (RoHS III)

ABB, Industrial Automation, Measurement & Analytics, fully supports the objectives of the ROHS directive. All in-scope products placed on the market by ABB are compliant to directives 2011/65/EU and 2015/863.

Product symbols

Symbols that may appear on this product are shown below:



Risk of electric shock.



This symbol, when noted on a product, indicates a potential hazard which could cause serious personal injury and / or death. The user should reference this instruction manual for operation and / or safety information.



Protective earth (ground) terminal.



Functional earth (ground) terminal.

Direct current supply only.

Alternating current supply only.



This symbol, when noted on a product enclosure or barrier, indicates that a risk of electrical shock and / or electrocution exists and indicates that only individuals qualified to work with hazardous voltages should open the enclosure or remove the barrier.



Recycle separately from general waste under the WEEE directive.

2 Sensors overview

R-series | reduced bore

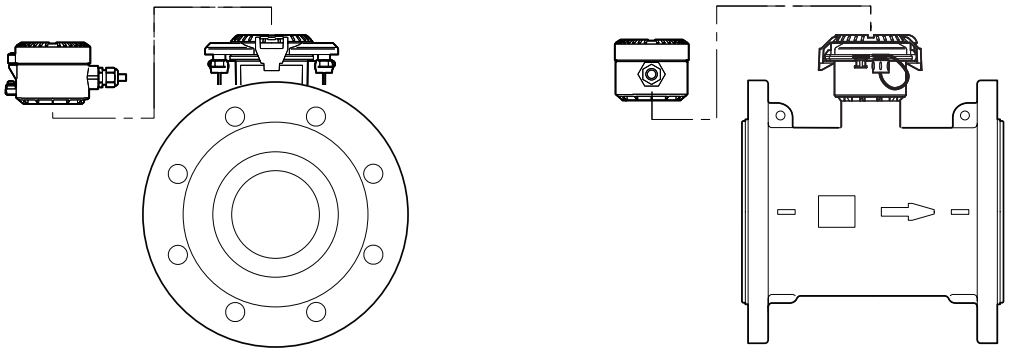


Figure 1 R-series DN40 to DN300

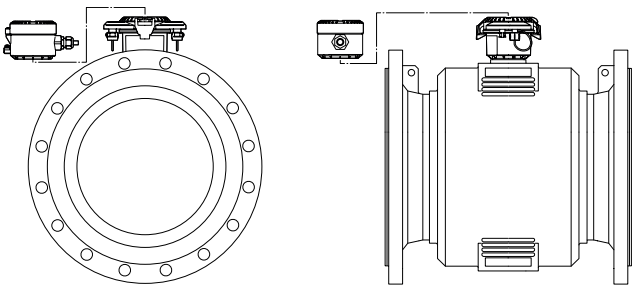


Figure 2 R-series DN350 to DN600

V-series | octagonal bore

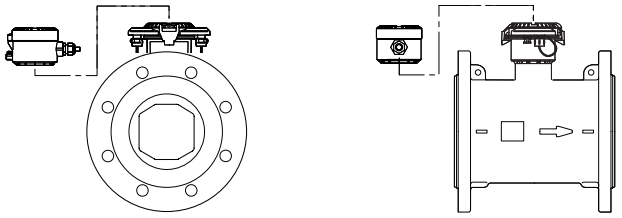


Figure 3 V-series DN40 to DN200

… 2 Sensors overview

F-series | full bore

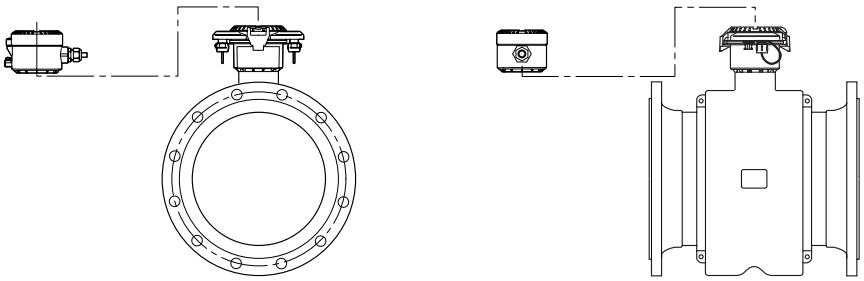


Figure 4 F-series DN250 to DN400

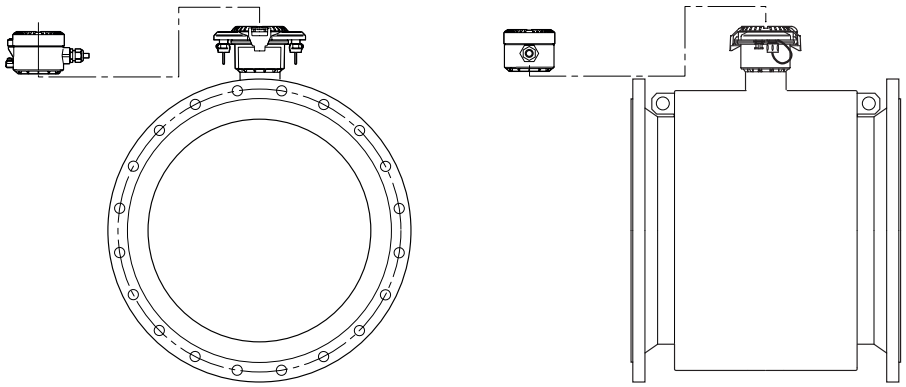


Figure 5 F-series DN450 to DN600

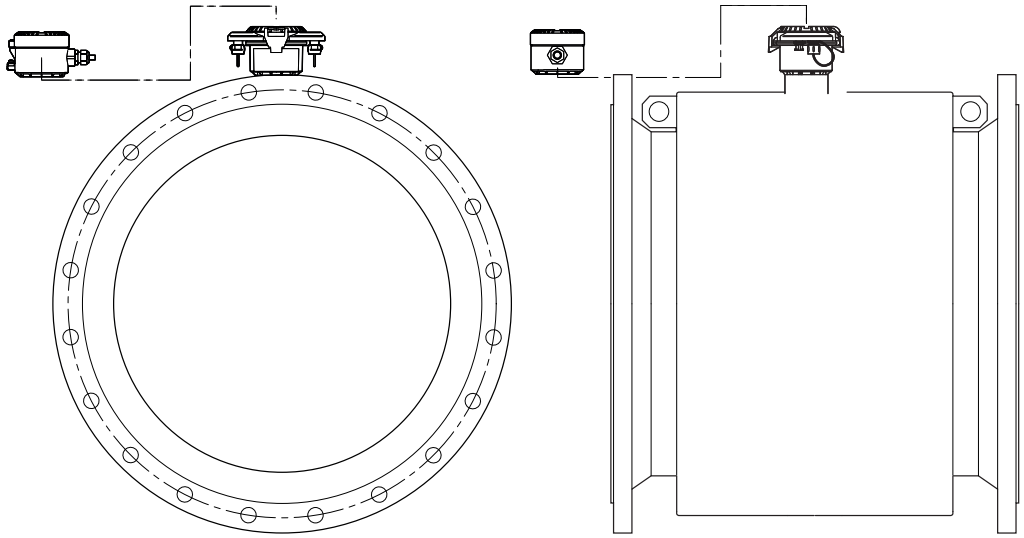
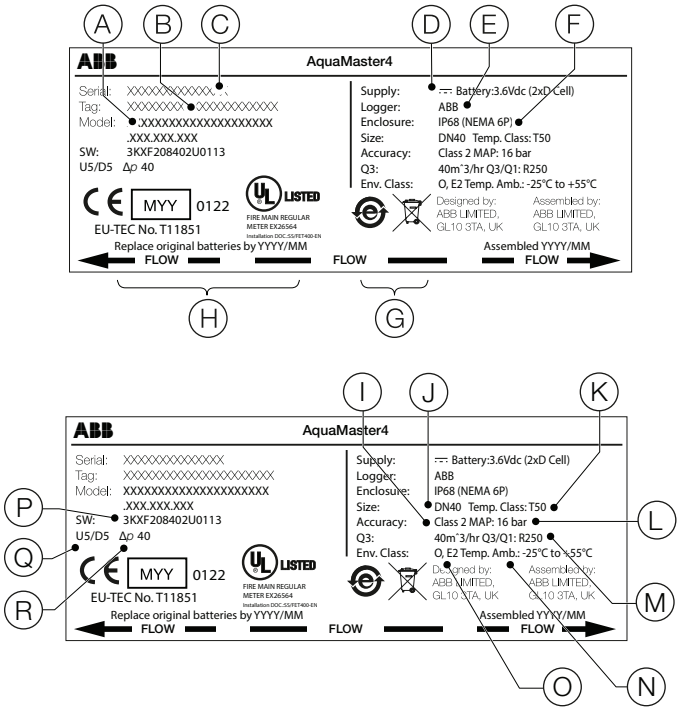


Figure 6 F-series DN700 to DN2400

3 Product identification

Nameplate – FEW41X/FEW43X

Integral transmitter

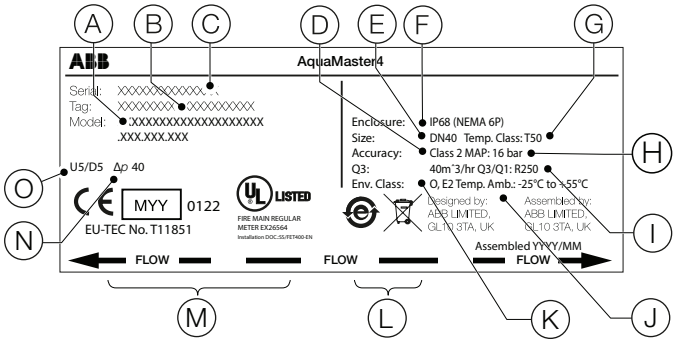


- (A) Model type/number
- (B) Transmitter-specific tag
- (C) ABB-defined product serial number
- (D) Min./Max. voltage rating
- (E) Logger (shown if available)
- (F) Enclosure ingress protection rating
- (G) Transmitter disposal categories
- (H) Applicable certification
- (I) OIML R49 class
- (J) Sensor size
- (K) Temperature class
- (L) Maximum admissable pressure
- (M) Highest flow rate within rated operating conditions
- (N) Ambient temperature
- (O) Environmental and electromagnetic class
- (P) Software number
- (Q) Installation sensitivity class
- (R) Pressure loss class

Figure 7 Name plate – integral sensor (example)

Note: For some product configurations, not all of the items listed will be printed on the labels.

Remote sensor

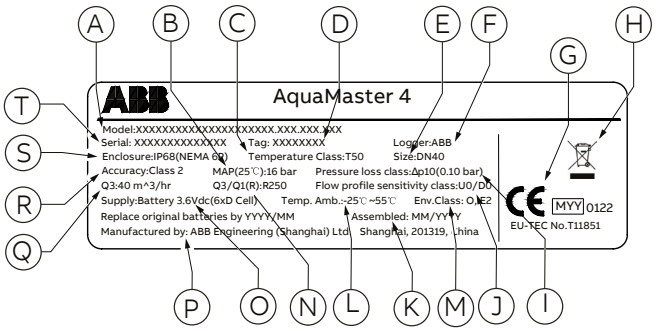


- (A) Model type / number
- (B) Sensor-specific tag
- (C) ABB-defined product serial number
- (D) OIML R49 accuracy class
- (E) Sensor size
- (F) Enclosure ingress protection rating
- (G) Temperature class
- (H) Maximum admissable pressure
- (I) Highest flow rate within rated operating conditions
- (J) Ambient temperature
- (K) Environmental and electromagnetic class
- (L) Disposal categories
- (M) Applicable certification
- (N) Pressure loss class
- (O) Installation sensitivity class

Figure 8 Name plate – remote sensor (example)

Nameplate – FEW45X

Integral transmitter

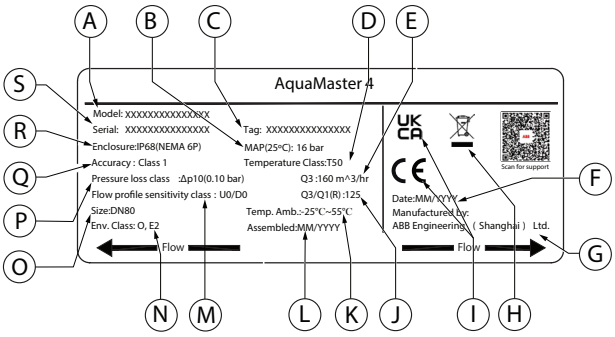


- (A) Model type/number
- (B) Maximum admissible pressure
- (C) Temperature class
- (D) Transmitter-specific tag
- (E) Sensor size
- (F) Logger (shown if available)
- (G) Applicable certification
- (H) Transmitter disposal categories
- (I) Pressure loss class
- (J) Installation sensitivity class
- (K) Date of manufacture
- (L) Ambient temperature
- (M) Environmental and electromagnetic class
- (N) Q3/Q1 (R)
- (O) Min./Max. voltage rating
- (P) Manufacturer
- (Q) Highest flow rate within rated operating conditions
- (R) OIML R49 class
- (S) Enclosure ingress protection rating
- (T) ABB-defined product serial number

Figure 9 Name plate – integral transmitter (example)

Note: For some product configurations, not all of the items listed will be printed on the labels.

Remote sensor



- (A) Model type / number
- (B) Maximum admissable pressure
- (C) Transmitter-specific tag
- (D) Temperature class
- (E) Highest flow rate within rated operating conditions
- (F) Date of manufacture
- (G) Manufacturer
- (H) Disposal categories
- (I) Applicable certification
- (J) Q3/Q1 (R)
- (K) Temperature class (Temp. Amb.:-25°C~55°C)
- (L) Date of manufacture (Assembled: MM/YYYY)
- (M) Installation sensitivity class
- (N) Environmental and Electromagnetic class (Env. Class: O, E2)
- (O) Sensor size
- (P) Pressure loss class
- (Q) OIML R49 accuracy class
- (R) Enclosure ingress protection rating
- (S) ABB-defined product serial number

Figure 10 Name plate – remote sensor (example)

4 Transport and storage

Inspection

Check the sensors immediately after unpacking for possible damage that may have occurred from improper transport. Details of any damage that has occurred in transit must be recorded on the transport documents. All claims for damages must be submitted to the shipper without delay and before installation.

Transport

WARNING – BODILY INJURY
Life-threatening danger due to suspended loads. In the case of suspended loads, a danger of the load falling exists.
Remaining under suspended loads is prohibited.

WARNING – RISK OF INJURY DUE TO SENSOR SLIPPING.
The sensor's center of gravity may be higher than the harness suspension points.
- Make sure that the sensor does not slip or turn during transport.
- Support the sensor laterally during transport.

Flanged sensors ≤ DN 450
- Carrying straps must be used to transport flanged designs smaller than DN 450.
- Wrap the straps around both process connections when lifting the sensor.
- Do not use chains as they may damage the housing.

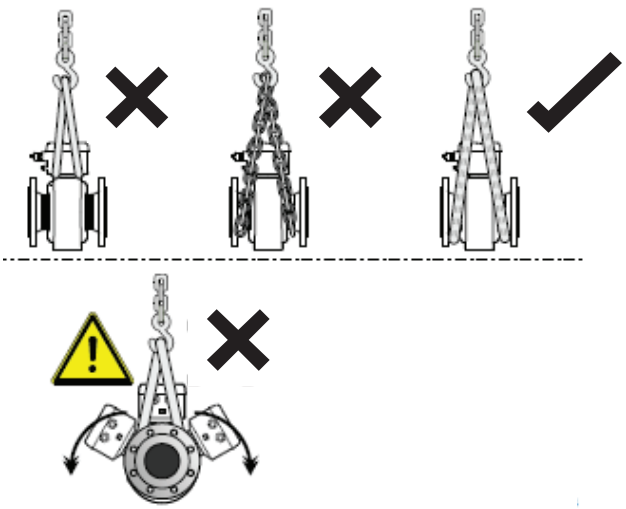


Figure 11 Transport instructions ≤ DN 450

Flanged sensors ≥ DN 450
- Flanged sensors must not be lifted by the center of the housing when using a forklift for transport.
- Flanged sensors must not be lifted by the terminal box or by the center of the housing.
- Only the transport lugs fitted to the sensor can be used to lift the sensor and insert it into the piping.

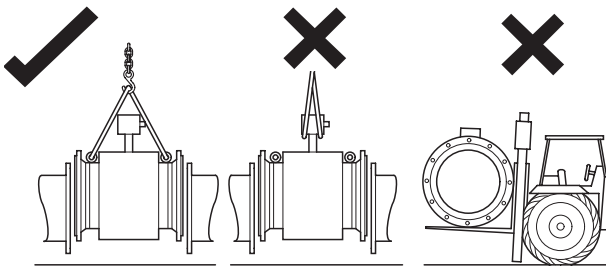


Figure 12 Transport instructions ≥ DN 450

Storing the sensor

Note the following when storing sensors:
- Store the sensor in its original packaging in a dry and dust-free location.
- Observe the permitted ambient conditions for transport and storage.
- Do not store the sensor in direct sunlight.

Storage temperature
–20 to 70 °C (–4 to 158 °F)
The ambient conditions for the transport and storage of the sensor must correspond to the ambient conditions for operation of the sensor.
Adhere to the AquaMaster4 data sheet (DS/FET400-EN)!

5 Installation

General information

The following points must be observed during installation:

- The flow direction must correspond to the marking, if present. The flow direction must correspond to the identification plate. The sensor measures the flowrate in both directions. **Forward flow is the factory setting**.
- Secure the flange bolts and nuts against pipe vibration.
- The sensors must be installed without mechanical tension (torsion, bending).
- Install flanged sensors with plane parallel counter flanges and use appropriate gaskets only.
- Only gaskets made from a material that is compatible with the measuring medium and measuring medium temperature must be used.
- Gaskets must not extend into the flow area, since possible turbulence could influence the accuracy of the sensor.
- The piping may not exert any inadmissible forces or torques on the sensor.
- Ensure temperature limits are not exceeded operating the sensor.
- Vacuum shocks in the piping should be avoided to prevent damage to the liners. Vacuum shocks can destroy the sensor.
- Do not remove the sealing plugs in the cable glands until you are ready to install the electrical cable.
- The transmitter with a remote mount design must be installed at a largely vibration-free location.
- Do not expose the transmitter and sensor to direct sunlight. Provide appropriate sun protection as necessary.
- When installing the transmitter in a control cabinet, make sure adequate cooling is provided.
- When installing a remote mounted transmitter ensure the sensor and the transmitter are compatible (been assigned correctly). Compatible sensors have the same end numbers on the name plate, e.g. flowmeter sensor X001 belongs to transmitter Y001 or flowmeter sensor X002 belongs to transmitter Y002.

Installation requirements

Lay lengths

Before installing sensors, ensure lay lengths are correct for installation requirements.

> **CAUTION**
> The installation conditions shown must be observed to achieve the best operational results.

Unpacking the sensor

Care must be taken when lifting the sensor to use the lifting hooks provided or sling under the body of the meter. Never lift the sensor using the terminal box as this causes damage and invalidates the warranty.

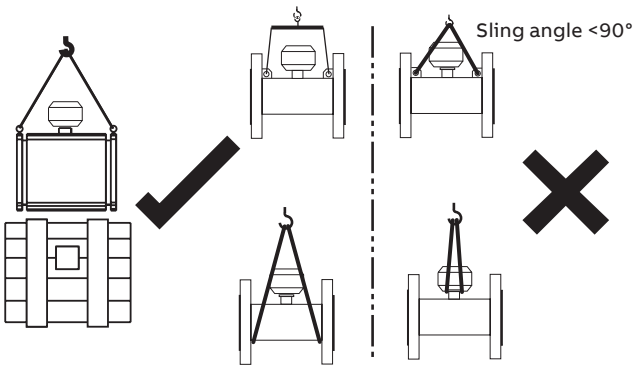


Figure 13 Unpacking

Fluid level

The sensor tube must always be completely full.

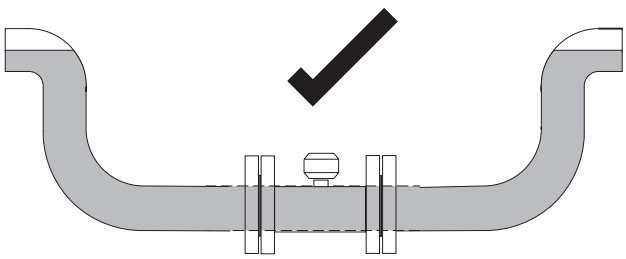


Figure 14 Fluid level in pipe

…5 Installation

…Installation requirements

Pipeline support

The sensor must be installed without mechanical tension (torsion, bending). If necessary, support the pipeline.

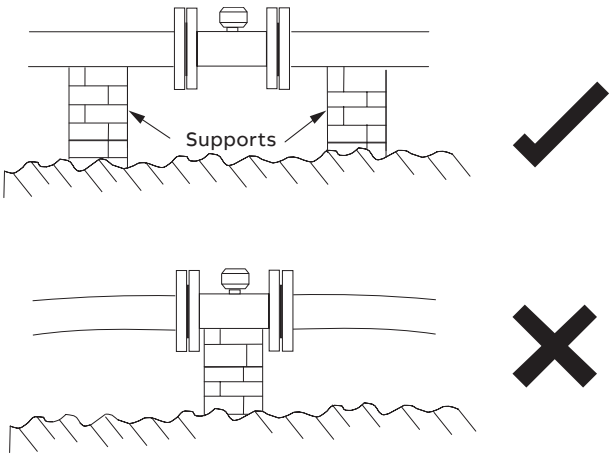


Figure 15 Pipeline support

Extremes of temperature

Do not install the sensor in a position that will expose it to extremes of temperature (direct sunlight, frost, snow). Provide appropriate weather protection where necessary.

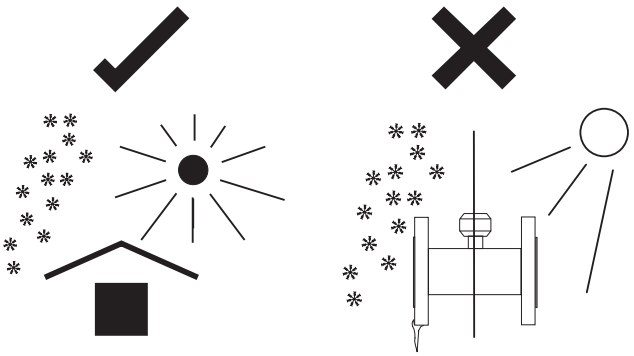


Figure 16 Extremes of temperature / adverse environments

Seal materials / fluid temperatures

The flange seal material must be compatible with the fluid and fluid temperatures.

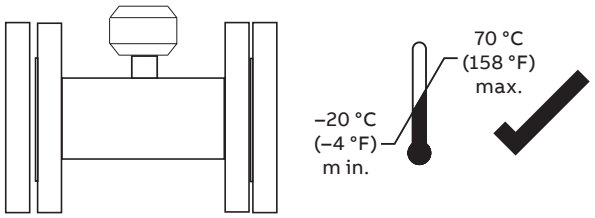


Figure 17 Within temperature limits

Pipeline forces / torque

The pipeline must not exert any forces and torques on the sensor (for example, vibration).

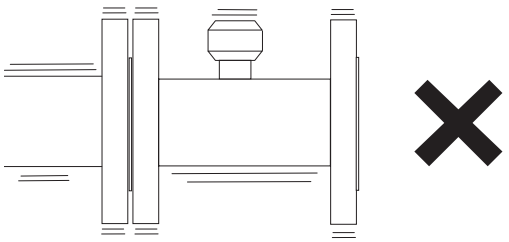


Figure 18 Vibration

Spillage onto the sensor

Do not install the sensor in an area where a spillage of any substance could damage the sensor.

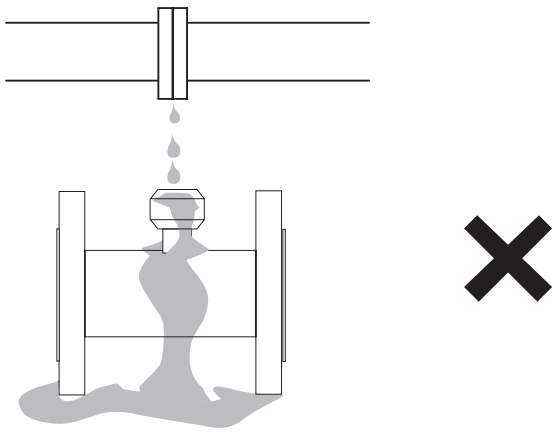


Figure 19 Spillage

Flow direction / straight pipe requirements

Ensure the flow direction in the pipeline corresponds to the identification plate. The sensor measures the flowrate in both directions. Forward flow is the factory setting.

V-style sensor: in most installations, a straight upstream section 5 x pipe diameters in length and a straight downstream section 0 x pipe diameters in length are sufficient.

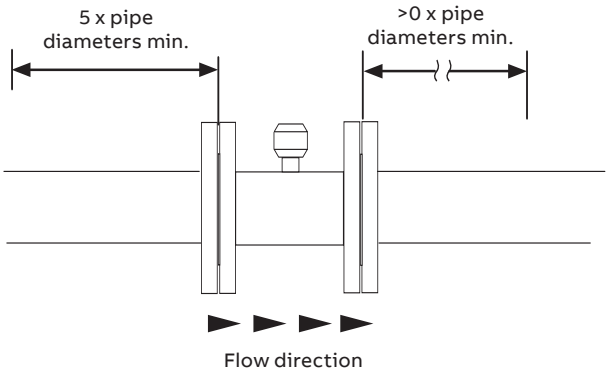


**Figure 20 V-style sensor –
flow direction / straight pipe requirements**

R-style sensor: straight upstream and downstream sections 0 x 0 pipe diameters in length are recommended.

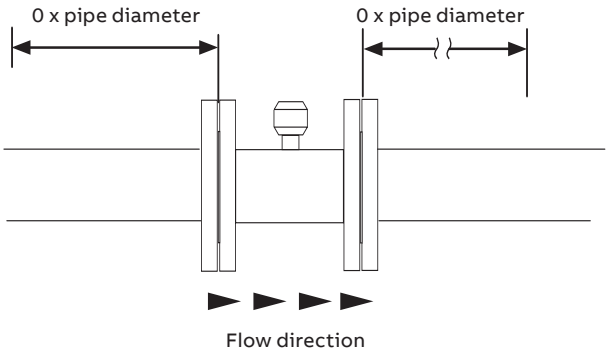


**Figure 21 R-style sensor –
flow direction / straight pipe requirements**

F-style sensor: in most installations, a straight upstream section 5 x pipe diameters in length and a straight downstream section 2 x pipe diameters in length are sufficient.

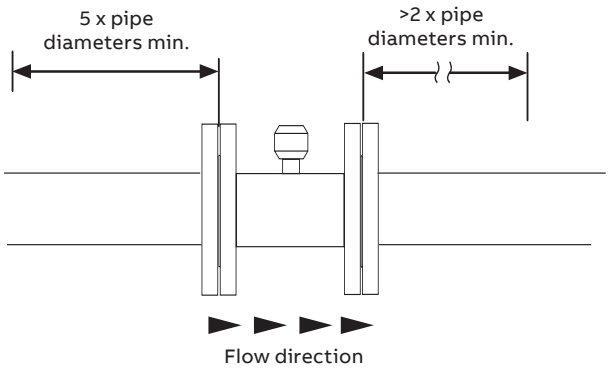


**Figure 22 F-style sensor –
flow direction / straight pipe requirements**

Electrode axis

The electrode axis must be horizontal wherever possible or no more than 45° from horizontal.

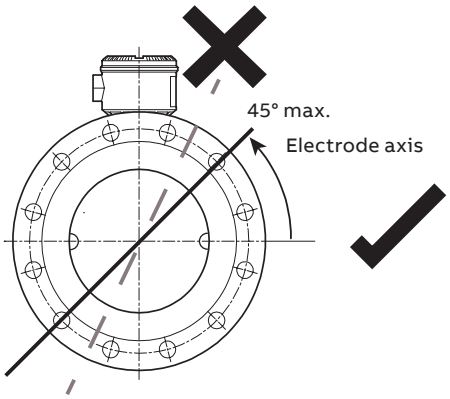


Figure 23 Flow conditions / orientation (electrode axis)

...5 Installation

Localized heating / welding

The sensor must not be submitted to localized heating during installation; take care to remember this is a measuring instrument.

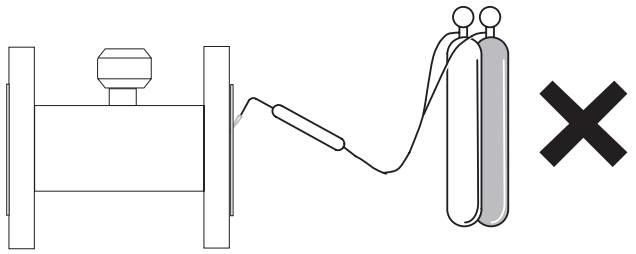


Figure 24 Localized heat

Environmental rating

Ensure the level of IP rating is correct for the required meter installation application. IP68 (NEMA 6P) rated meters can be submerged continuously.

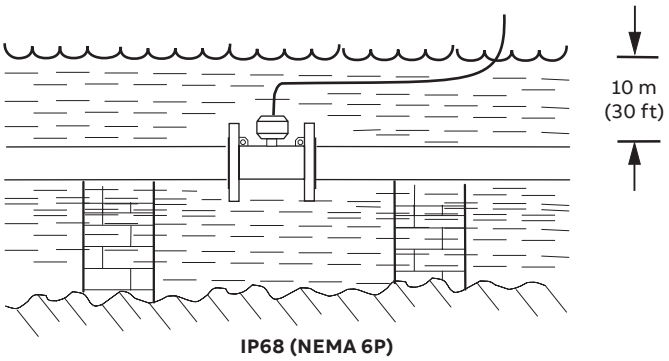


Figure 25 Within environmental rating

Gasket fitting

Use correctly sized gaskets. Do NOT fit gaskets that extend into the flow area – the turbulence caused adversely affects sensor accuracy.

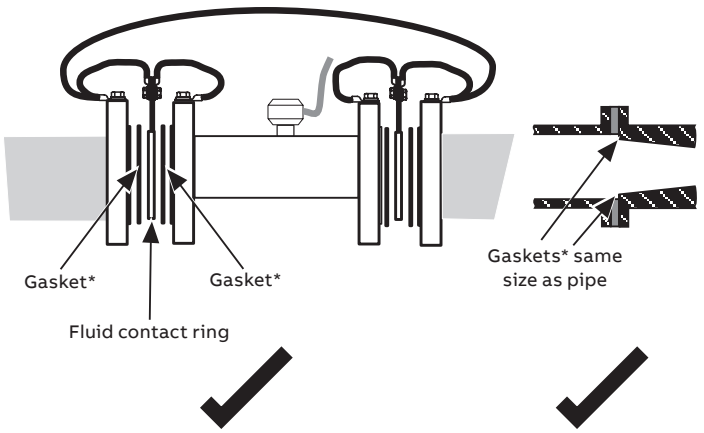


Figure 26 Fit gaskets same size as pipe

* Gaskets not supplied

Cable routing

> **IMPORTANT NOTE**
> Do not attempt to join signal cable to increase cable length.

The cable to the sensor must be installed neatly or within a conduit. Both loose or conduit installations must have a u-bend below terminal box height to enable any water to run off thus avoiding any capillary action into the sensor.

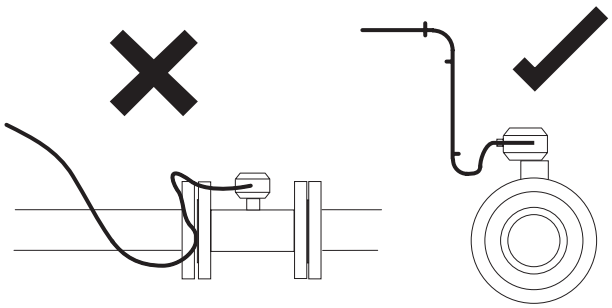


Figure 27 Cable routing to enable water run off

Observe the following points when routing signal cables:

- Keep the remote form sensor cable as short as possible to avoid unnecessary electrical and magnetic pickup. Lengths* up to 150 m (492 ft) are permitted, but are more susceptible to unwanted pickup.
- Avoid routing the cable in the vicinity of electrical equipment or switching elements that can create stray fields, switching pulses and induction
- Avoid running sensor cables adjacent to those from other electromagnetic flowmeters, especially in the same cable ducts, as unwanted magnetic coupling can induce unwanted signals and cause incorrect operation of the sensor. Ideally, adjacent cables should be >200 mm (8 in.) apart.
- Do not damage the sheathing of the cable during installation.
- Ensure that a drip loop (water trap) is used when installing the connecting cables for the sensor.

*Sensus™ cable is available in 5 and 20 m (15 and 65 ft) lengths. Renewable energy cable is available as a 10 m (30 ft) length.

Burying a sensor

When burying a sensor, ensure it can be found easily if required (for example, mark the installation position with a post). Installing a protection plate above the meter is also recommended.

> ⚠ **CAUTION**
> For further advice when burying sensors, contact the ABB Service Organization.

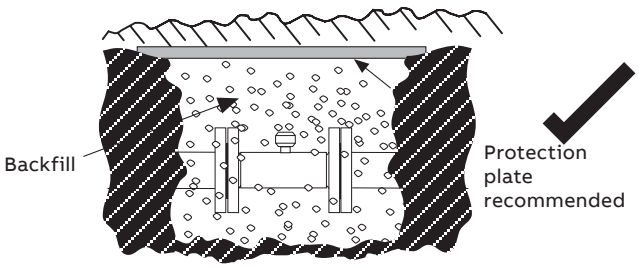


Figure 28 Underground installations

Sensor separation

If F-, V-, R-style sensors are installed in adjacent pipelines, ensure they are at least 0.7 m (2.3 ft) apart to prevent the electromagnetic field from one meter affecting the other.

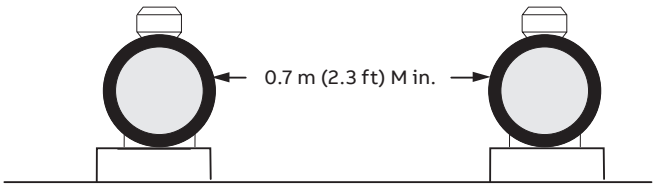


Figure 29 Sensor separation

…5 Installation

Dimensions

R-style sensor – DN 40 to DN 300 (1½ to 12 in.)

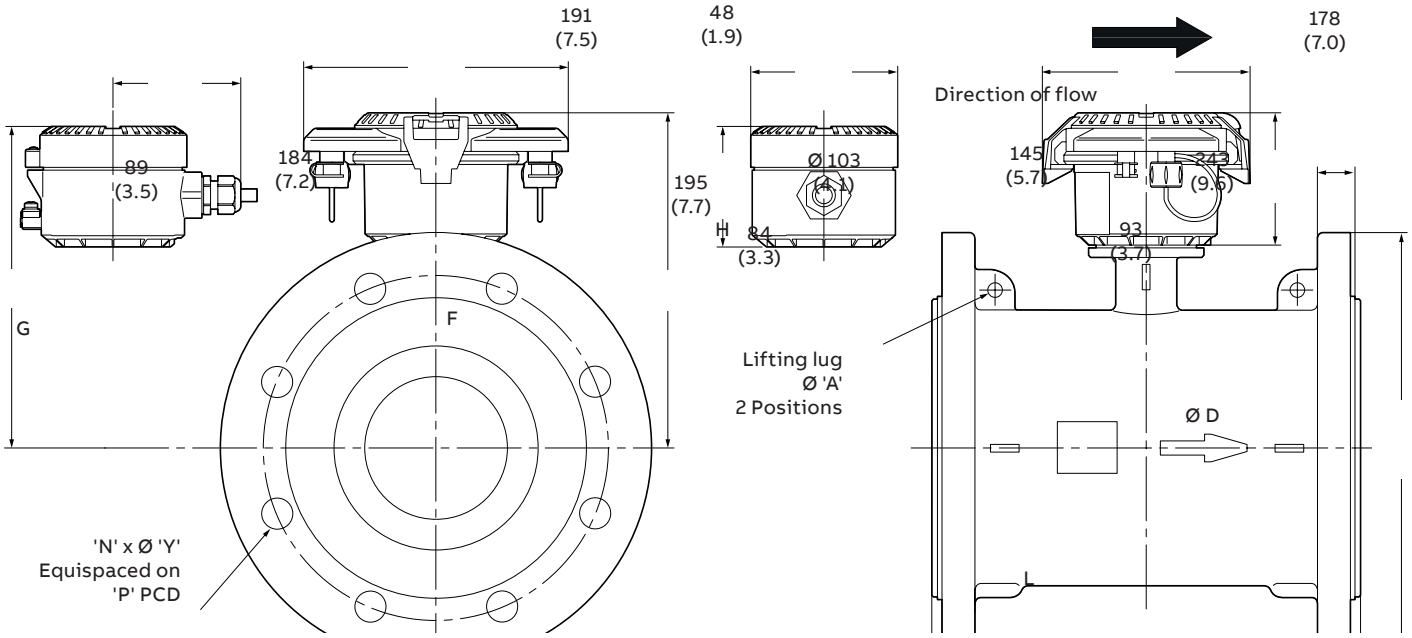


Figure 30 R-style sensor – DN 40 to DN 300 (1½ to 12 in.)

Sensor size	Flange		Dimensions in mm (in.)									Approx. weight kg (lbs)		
	Standard	Class	Flange OD	No. holes	Bolt hole dia.	Bolt hole PCD	Sensor length	Tx. height	T. box height	Tx. height	Lifting lug	Integral FEW411/ FEW431	Remote	Integral FEW451
			D	N	Y	P	L	F	G	H	A			
DN 40 (1½ in.)	EN 1092	PN 10, 16, 25	150 (5.9)	4	19 (0.75)	110 (4.3)	200 (7.9)	158 (6.2)	149 (5.9)	308 (12.1)	N/A	13 (29)	12 (27)	15 (34)
	ASME B16.5	CL150			15.7 (0.62)	98 (3.9)								
	AS 2129	Table E	135 (5.3)		14 (0.55)			154 (6.1)	144 (5.7)	304 (12.0)		11 (24)	8 (18)	13 (29)
	JIS B2220	5K	120 (4.7)		15 (0.59)	95 (3.7)								
		10K	140 (5.5)		19 (0.75)	105 (4.2)								
DN 50 (2 in.)	EN 1092	PN 10, 16, 25	165 (6.5)	4	19 (0.75)	125 (4.9)	200 (7.9)	162 (6.4)	153 (6.0)	312 (12.3)	N/A	15 (32)	14 (30)	17 (38)
	ASME B16.5	CL150				121 (4.8)								
	AS 2129	Table E	150 (5.9)		18 (0.71)	114 (4.5)			152 (6.0)			12 (26)	9 (20)	14 (31)
	AS 4087	PN 16												
	JIS B2220	5K	130 (5.1)		15 (0.59)	105 (4.1)								
		10K	155 (6.1)		19 (0.75)	120 (4.7)								
DN 65 (2½ in.)	EN 1092	PN 10, 16	185 (7.3)	4	19 (0.75)	145 (5.7)	200 (7.9)	176 (6.9)	167 (6.6)	326 (12.8)	N/A	19 (42)	18 (40)	21 (47)
		PN 25		8										
	ASME B16.5	CL150		4	20 (0.79)	140 (5.5)								
	AS 2129	Table E	165 (6.5)		18 (0.71)	127 (5.0)		168 (6.6)	158 (6.2)	318 (12.5)		14 (31)	11 (24)	16 (36)
	AS 4087	PN 16												
	JIS B2220	5K	155 (6.1)		15 (0.59)	130 (5.1)								
		10K	175 (6.9)		19 (0.75)	140 (5.5)								
DN 80 (3 in.)	EN 1092	PN 10, 16, 25	200 (7.9)	8	19 (0.75)	160 (6.3)	200 (7.9)	181 (7.1)	172 (6.8)	331 (13.0)	N/A	21 (47)	20 (44)	23 (51)
	ASME B16.5	CL150		4	20 (0.79)	152 (6.0)								
	AS 2129	Table E	185 (7.3)		18 (0.71)	146 (5.8)		174 (6.9)	165 (6.5)	324 (12.8)		17 (37)	14 (31)	19 (42)
	AS 4087	PN 16												
	JIS B2220	5K	180 (7.1)		19 (0.75)	145 (5.7)								
		10K	185 (7.3)	8		150 (5.9)								

Table 1 R-style sensor – DN 40 to DN 80 (1½ to 3 in.)

Sensor size	Flange		Dimensions in mm (in.)									Approx. weight kg (lbs)		
	Standard	Class	Flange OD	No. holes	Bolt hole dia.	Bolt hole PCD	Sensor length	Tx. height	T. box height	Tx. height	Lifting lug	Integral FEW411/ FEW431	Remote	Integral FEW451
			D	N	Y	P	L	F	G	H	A			
DN 100 (4 in.)	EN 1092	PN 10, 16	235 (9.3)	8	19 (0.75)	180 (7.1)	250 (9.9)	202 (8.0)	193 (7.6)	352 (13.9)	N/A	27 (60)	26 (58)	29 (64)
		PN 25			23 (0.91)	190 (7.5)								
	ASME B16.5	CL150			19 (0.75)	191 (7.5)								
	AS 2129	Table E	215 (8.5)	4	18 (0.71)	178 (7.0)		212 (8.3)	203 (8.0)	362 (14.3)		23 (51)	20 (44)	25 (56)
	AS 4087	PN 16												
	JIS B2220	5K	200 (7.9)	8	19 (0.75)	165 (6.5)								
		7.5K	238 (9.4)	4		195 (7.7)								
		10K	210 (8.3)	8		175 (6.9)								
DN 125 (5 in.)	EN 1092	PN 10, 16	270 (10.6)	8	18 (0.71)	210 (8.3)	250 (9.9)	221 (8.7)	212 (8.3)	371 (14.6)	N/A	30 (66)	29 (64)	32 (71)
		PN 25			28 (1.10)	220 (8.7)								
	ASME B16.5	CL150			22 (0.87)	216 (8.5)								
	AS 2129	Table E	255 (10.0)		18 (0.71)	210 (8.3)		212 (8.3)	203 (8.0)	362(14.3)		26 (57)	23 (51)	28 (62)
	JIS B2220	5K	235 (9.3)		19 (0.75)	200 (7.9)								
		10K	250 (9.8)		23 (0.91)	210 (8.3)								
DN 150 (6 in.)	EN 1092	PN 10, 16	300 (11.8)	8	23 (0.91)	240 (9.5)	300 (11.8)	233 (9.2)	224 (8.8)	383(15.1)	10.2 (0.40)	35 (77)	34 (75)	37 (82)
	ASME B16.5	CL150			22 (0.87)	242 (9.5)								
	EN 1092	PN 25	280 (11.0)		26 (1.02)	250 (9.8)			223 (8.8)			33 (73)	31 (68)	35 (78)
	AS 2129	Table E			22 (0.87)	235 (9.3)								
	AS 4087	PN 16			18 (0.71)									
	JIS B2220	5K	265 (10.4)		19 (0.75)	230 (9.1)								
		7.5K	290 (11.4)	6		247 (9.7)								
		10K	280 (11.0)	8	23 (0.91)	240 (9.5)								
DN 200 (8 in.)	EN 1092	PN 10	370 (14.6)	8	23 (0.91)	295 (11.6)	350 (13.8)	259 (10.2)	249 (9.8)	409 (16.1)	10.2 (0.40)	68 (150)	67 (147)	70 (155)
		PN 16		12										
		PN 25	360 (14.2)		28 (1.10)	310 (12.2)								
	ASME B16.5	CL150	370 (14.6)	8	22 (0.87)	298 (11.7)		258 (10.2)		408 (16.1)		51 (112)	48 (106)	53 (117)
	AS 2129	Table E	335 (13.2)			292 (11.5)								
	AS 4087	PN 16			18 (0.71)									
	JIS B2220	5K	320 (12.6)		23 (0.91)	280 (11.0)								
		7.5K	342 (8.7)		19 (0.75)	299 (11.8)								
		10K	330 (13.0)	12	23 (0.91)	290 (11.4)								
DN 250 (10 in.)	EN 1092	PN10	395 (15.6)	12	22 (0.87)	350 (0.87)	450 (17.7)	285 (11.2)	276 (10.9)	435 (17.1)	10.2 (0.40)	78 (172)	75 (165)	80 (177)
		PN16	405 (15.9)		26 (1.02)	355 (14.0)								
		PN25	425 (16.7)		30 (1.18)	370 (14.6)								
	AS 2129	Table E	405 (15.9)		22 (0.87)	356 (14.0)								
	AS 4087	PN 16		8										
	JIS B2220	5K	385 (15.2)	12	23 (0.91)	345 (13.6)								
		7.5K	410 (16.1)	8		360 (14.2)								
		10K	400 (15.8)	12	25 (0.98)	355 (14.0)								
	ASME B16.5	CL150	406 (16.0)	12	22 (0.87)	362 (14.3)								
DN 300 (12 in.)	EN 1092	PN10	445 (17.5)	12	22 (0.87)	400 (15.8)	500 (19.7)	310 (12.2)	301 (11.9)	460(18.1)	10.2 (0.40)	115 (253)	112 (247)	117 (258)
		PN16	460 (18.1)		26 (1.02)	410 (16.1)								
		PN25	485 (19.1)	16	30 (1.18)	430 (16.9)								
	AS 2129	Table E	455 (17.9)	12	26 (1.02)	406 (16.0)								
	AS 4087	PN 16			22 (0.87)									
	JIS B2220	5K	430 (16.9)	12	23 (0.91)	390 (15.4)								
		7.5K	464 (18.3)	10		414 (16.3)								
		10K	445 (17.5)	16	25 (0.98)	400 (15.8)								
	ASME B16.5	CL150	483 (19.0)	12	22 (0.87)	432 (17.0)								

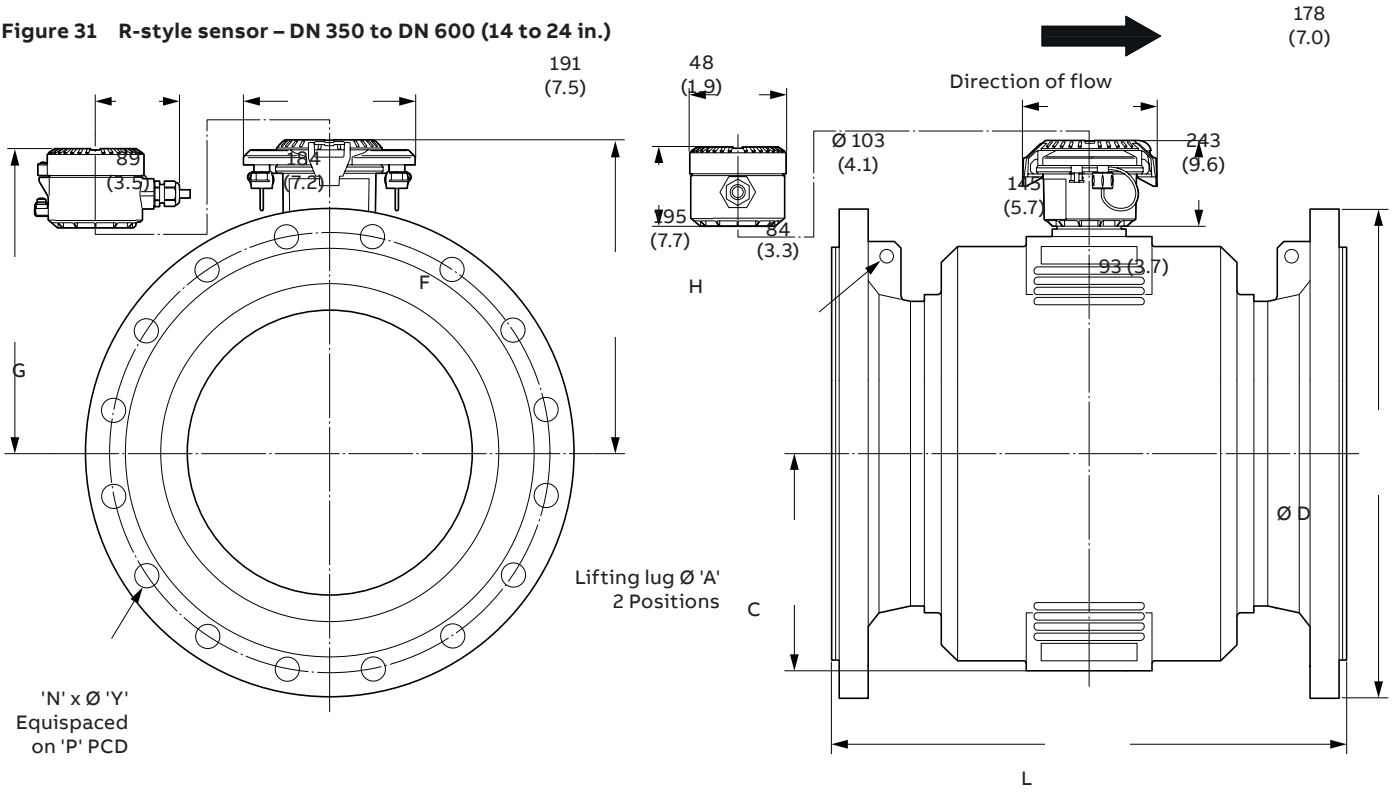
Table 2 R-style sensor – DN 100 to DN 300 (4 to 12 in.)

…5 Installation

…Dimensions

R-style sensor – DN 350 to DN 600 (14 to 24 in.)

Figure 31 R-style sensor – DN 350 to DN 600 (14 to 24 in.)



Sensor size	Flange		Dimensions in mm (in.)										Approx. weight kg (lbs)		
	Standard	Class	Flange OD	No. Holes	Bolt hole dia	Bolt hole PCD	Sensor length	Tx. height	T. box height	Tx. height	Lifting lug	Cover flat	Integral FEW411/ FEW431	Remote	Integral FEW451
			D	N	Y	P	L	F	G	H	A	C			
DN 350 (14 in.)	EN 1092	PN 10	505 (19.9)	16	22 (0.87)	460 (18.1)	550 (21.7)	334 (13.2)	324 (12.8)	484 (19.1)	14.5 (0.57)	231 (9.1)	102 (225)	100 (220)	104 (230)
		PN 16	520 (20.5)		26 (1.02)	470 (18.5)									
		PN 25	555 (21.9)		33 (1.30)	490 (19.3)									
	ASME B16.5	CL150	535 (21.1)	12	29.5 (1.16)	476 (18.8)									
	AS 2129	Table E	525 (20.7)		26 (1.02)	470 (18.5)									
	AS 4087	PN 16													
	JIS B2220	5K	480 (18.9)		25 (0.98)	435 (17.1)									
		7.5K	530 (20.7)	10		472 (18.6)									
		10K	490 (19.3)	16		445 (17.5)									
DN 400 (16 in.)	EN 1092	PN 10	565 (22.3)	16	26 (1.02)	515 (20.3)	600 (23.6)	360 (14.2)	354 (13.9)	510 (20.1)	14.5 (0.57)	257 (10.1)	117 (258)	115 (254)	119 (263)
		PN 16	580 (22.8)		30 (1.18)	525 (20.7)									
		PN 25	620 (24.4)		36 (1.42)	550 (21.7)									
	ASME B16.5	CL150	600 (23.6)		29.5 (1.16)	540 (21.3)									
	AS 2129	Table E	580 (22.8)	12	26 (1.02)	521 (20.5)									
	AS 4087	PN 16													
	JIS B2220	5K	540 (21.3)	16	25 (0.98)	495 (19.5)									
		7.5K	582 (22.9)	12		524 (20.6)									
		10K	560 (22.1)	16	27 (1.06)	510 (20.1)									
DN 450 (18 in.)	EN 1092	PN 10	615 (24.2)	20	26 (1.02)	565 (22.3)	700 (27.6)	388 (15.3)	379 (14.9)	538 (21.2)	14.5 (0.57)	285 (11.2)	162 (357)	160 (353)	164 (362)
		PN 16	640 (25.2)		30 (1.18)	585 (23.0)									
		PN 25	670 (26.4)		36 (1.42)	600 (23.6)									
	ASME B16.5	CL150	635 (25.0)	16	32.5 (1.28)	578 (22.8)									
	AS 2129	Table E	640 (25.2)	16	26 (1.02)	584 (23.0)									
	AS 4087	PN 16		12											
	JIS B2220	5K	605 (23.8)	16	25 (0.98)	555 (21.9)									
		7.5K	652 (25.7)	12	27 (1.06)	585 (23.0)									
		10K	620 (24.4)	20		565 (22.3)									
DN 500 (20 in.)	EN 1092	PN 10	670 (26.4)	20	26 (1.02)	620 (24.4)	770 (30.3)	419 (16.5)	410 (16.2)	569 (22.4)	14.5 (0.57)	316 (12.5)	219 (483)	217 (477)	221 (488)
		PN 16	715 (28.2)		33 (1.30)	650 (25.6)									
		PN 25	730 (28.7)		36 (1.42)	660 (26.0)									
	ASME B16.5	CL150	700 (27.6)		32.5 (1.28)	635 (25.0)									
	AS 2129	Table E	705 (27.8)	16	26 (1.02)	641 (25.2)									
	AS 4087	PN 16													
	JIS B2220	5K	655 (25.8)	20	25 (0.98)	605 (23.8)									
		7.5K	706 (27.8)	12	27 (1.06)	639 (25.2)									
		10K	675 (26.6)	20		620 (24.4)									
DN 600 (24 in.)	EN 1092	PN 10	780 (30.7)	20	30 (1.18)	725 (28.6)	920 (36.2)	446 (17.6)	437 (17.2)	596 (23.5)	14.5 (0.57)	343 (13.5)	317 (699)	315 (695)	319 (704)
		PN 16	840 (33.1)		36 (1.42)	770 (30.3)									
		PN 25	845 (33.3)		39 (1.54)										
	ASME B16.5	CL150	815 (32.1)		35.5 (1.40)	749.5 (29.5)									
	AS 2129	Table E	825 (32.5)	16	33 (1.30)	756 (29.7)									
	AS 4087	PN 16			30 (1.18)										
	JIS B2220	5K	770 (30.3)	20	27 (1.06)	715 (28.2)									
		7.5K	810 (31.9)	16		743 (29.3)									
		10K	795 (31.3)	24	33 (1.30)	730 (28.7)									

Table 3 R-style sensor – DN 350 to DN 600 (14 to 24 in.)

…5 Installation

…Dimensions

V-style sensor – DN 40 to DN 200 (1½ to 8 in.)

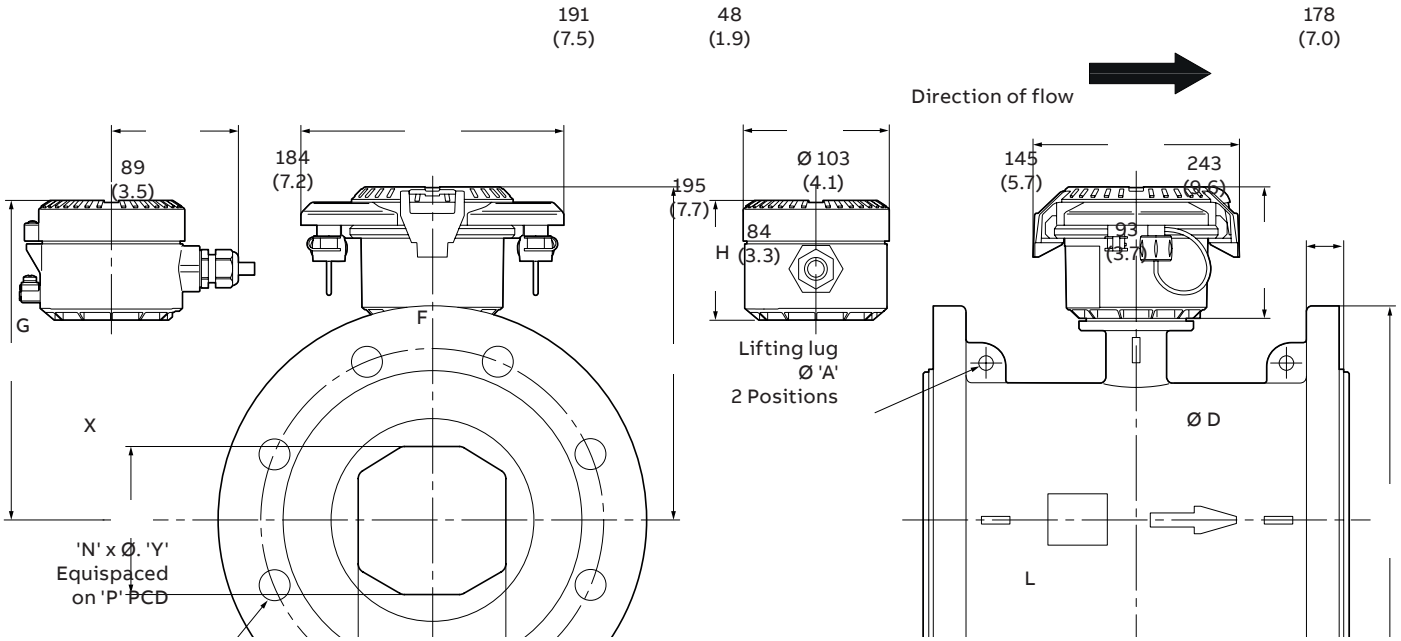


Figure 32 V-style sensor – DN 40 to DN 200 (1½ to 8 in.)

Sensor size	Flange		Dimensions in mm (in.)									Approx. weight kg (lbs)		
	Standard	Class	Flange OD	No. holes	Bolt hole dia.	Bolt hole PCD	Sensor length	Tx. height	T. box height	Tx. height	Lifting lug	Integral FEW411 FEW431	Remote	Integral FEW451
			D	N	Y	P	L	F	G	H	A			
DN 40 (1½ in.)	EN 1092	PN 10, 16, 25	150 (5.9)	4	19 (0.75)	110 (4.3)	200 (7.9)	158 (6.2)	149 (5.9)	308 (12.1)	N/A	13 (29)	12 (27)	15 (33)
	ASME B16.5	CL150			15.7 (0.62)	98 (3.9)								
	AS 2129	Table E	135 (5.3)		14 (0.55)			154 (6.1)	144 (5.7)	304 (12)		10 (22)	7 (15)	12 (27)
	JIS B2220	10K	140 (5.5)		19 (0.75)	105 (4.2)								
DN 50 (2 in.)	EN 1092	PN 10, 16, 25	165 (6.5)	4	19 (0.75)	125 (4.9)	200 (7.9)	162 (6.4)	153 (6.0)	312 (12.3)	N/A	14 (31)	13 (29)	16 (36)
	ASME B16.5	CL150				121 (4.8)								
	AS 2129	Table E	150 (5.9)		18 (0.71)	114 (4.5)						11 (24)	8 (18)	13 (29)
	AS 4087	PN 16												
	JIS B2220	10K	155 (6.1)		19 (0.75)	120 (4.7)								
DN 65 (2½ in.)	EN 1092	PN 10, 16	185 (7.3)	4	19 (0.75)	145 (5.7)	200 (7.9)	176 (6.9)	167 (6.6)	326 (12.9)	N/A	16 (35)	15 (33)	18 (40)
		PN 25		8										
	ASME B16.5	CL150			20 (0.79)	140 (5.5)								
	AS 2129	Table E	165 (6.5)	4	18 (0.71)	127 (5.0)		168 (6.6)	158 (6.2)	318 (12.5)		13 (29)	10 (22)	15 (33)
	AS 4087	PN 16												
	JIS B2220	10K	175 (6.9)		19 (0.75)	140 (5.5)								
DN 80 (3 in.)	EN 1092	PN 10, 16, 25	200 (7.9)	8	19 (0.75)	160 (6.3)	200 (7.9)	181 (7.1)	172 (6.8)	331 (13.1)	N/A	17 (38)	16 (36)	19 (42)
	ASME B16.5	CL150			20 (0.79)	152 (6.0)								
	AS 2129	Table E	185 (7.3)	4	18 (0.71)	146 (5.8)		174 (6.9)	165 (6.5)	324 (12.8)		16 (36)	13 (28)	18 (40)
	AS 4087	PN 16												
	JIS B2220	10K		8	19 (0.75)	150 (5.9)								
DN 100 (4 in.)	EN 1092	PN 10, 16	235 (9.3)	8	19 (0.75)	180 (0.71)	250 (9.9)	202 (8.0)	193 (7.6)	352 (13.9)	N/A	19 (42)	18 (40)	21 (47)
		PN 25			23 (0.91)	190 (7.5)								
	ASME B16.5	CL150			19 (0.75)	191 (7.5)								
	AS 2129	Table E	215 (8.5)		18 (0.71)	178 (7.0)								
	AS 4087	PN 16		4				212 (8.3)	203 (8.0)	362 (14.2)				
	JIS B2220	7.5K	238 (9.4)		19 (0.75)	195 (7.7)								
		10K	210 (8.3)	8		175 (6.9)								
DN 125 (5 in.)	EN 1092	PN 10, 16	270 (10.6)	8	18 (0.71)	210 (8.3)	250 (9.9)	221 (8.7)	212 (8.3)	371 (14.6)	N/A	30 (66)	29 (64)	32 (71)
		PN 25			28 (1.10)	220 (8.7)								
	ASME B16.5	CL150			22 (0.87)	216 (8.5)								
	AS 2129	Table E	255 (10.0)		18 (0.71)	210 (8.3)		212 (8.3)	203 (8.0)	362 (14.3)		24 (53)	21 (46)	26 (58)
	JIS B2220	10K	250 (9.8)		23 (0.91)	201 (8.3)								
DN 150 (6 in.)	EN 1092	PN10, 16	300 (11.8)	8	23 (0.91)	240 (9.5)	300 (11.8)	233 (9.2)	224 (8.8)	383 (15.1)	10.2 (0.40)	35 (77)	34 (75)	37 (82)
	ASME B16.5	CL150			22 (0.87)	242 (9.5)								
	EN 1092	PN 25			26 (1.02)	250 (9.8)								
	AS 2129	Table E	280 (11.0)		22 (0.87)	235 (9.3)		235 (9.3)	225 (8.9)	385 (15.2)		34 (75)	31 (68)	36 (80)
	AS 4087	PN 16			18 (0.71)									
	JIS B2220	7.5K	290 (11.4)	6	19 (0.75)	247 (9.7)								
		10K	280 (11.0)	8	23 (0.91)	240 (9.5)								
DN 200 (8 in.)	EN 1092	PN10	370 (14.6)	8	23 (0.91)	295 (11.6)	350 (13.8)	259 (10.2)	249 (9.8)	409 (16.1)	10.2 (0.40)	67 (147)	66 (145)	69 (153)
		PN16		12										
		PN 25	360 (14.2)		28 (1.10)	310 (12.2)								
	ASME B16.5	CL150	370 (14.6)	8	22 (0.87)	298 (11.7)								
	AS 2129	Table E	335 (13.2)			292 (11.5)								
	AS 4087	PN 16			18 (0.71)			258 (10.2)	249 (9.8)	408 (16.1)		53 (116)	50 (110)	55 (122)
	JIS B2220	7.5K	342 (8.7)		19 (0.75)	299 (11.8)								
		10K	330 (13.0)	12	23 (0.91)	290 (11.4)								

Table 4 V-style sensor – DN 40 to DN 200 (1½ to 8 in.)

…5 Installation

…Dimensions

F-style sensor – DN 250 to DN 400 (10 to 16 in.)

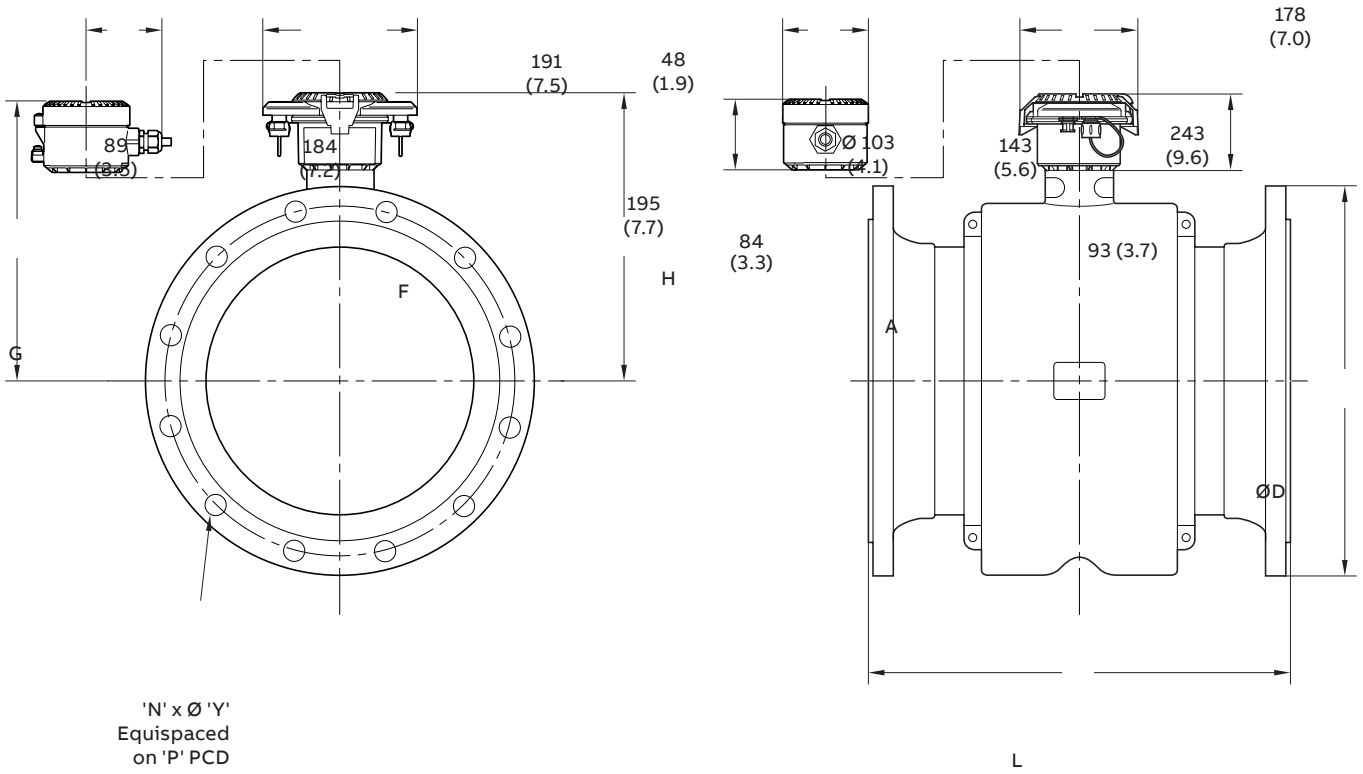


Figure 33 F-style sensor – DN 250 to DN 400 (10 to 16 in.)

Sensor size	Flange		Dimensions in mm (in.)									Approx. weight kg (lbs)		
	Standard	Class	Flange OD	No. holes	Bolt hole dia.	Bolt hole PCD	Sensor length	Tx. height	T. box height	Tx. height	Lifting lug	Integral FEW411/ FEW431	Remote	Integral FEW451
			D	N	Y	P	L	F	G	H	A			
DN250 (10 in.)	EN 1092 or DIN	PN10	395 (15.55)	12	22 (0.87)	350 (13.78)	450 (17.72)	319 (12.56)	310 (12.20)	469 (18.46)	N/A	61 (134)	59 (130)	63 (139)
		PN16	405 (15.94)		26 (1.02)	355 (13.98)						65 (143)	63 (139)	67 (148)
		PN25	425 (16.73)		30 (1.18)	370 (14.57)						84 (185)	82 (181)	86 (190)
		PN40	450 (17.72)		33 (1.30)	385 (15.16)						95 (209)	93 (205)	97 (214)
	AS4087	PN16	405 (15.94)	8	22 (0.87)	356 (14.02)						65 (143)	63 (139)	67 (148)
		PN35	430 (16.93)	12	26 (1.02)	381 (15.00)						95 (209)	93 (205)	97 (214)
	JIS B2220	5K	385 (15.16)		23 (0.91)	345 (13.58)						65 (143)	63 (139)	67 (148)
		10K	400 (15.75)		25 (0.98)	355 (13.98)								
	ASME B16.5	CL300	445 (17.52)	16	29 (1.13)	387 (15.25)						105 (231)	103 (227)	107 (236)
		CL150	405 (15.94)	12	26 (1.02)	362 (14.25)						70 (154)	68 (150)	72 (159)
DN300 (12 in.)	EN 1092 or DIN	PN10	445 (17.52)	12	22 (0.87)	400 (15.75)	500 (19.69)	342 (13.46)	333 (13.11)	492 (19.37)	N/A	74 (163)	72 (159)	76 (168)
		PN16	460 (18.11)		26 (1.02)	410 (16.14)						80 (176)	78 (172)	82 (181)
		PN25	485 (19.09)	16	30 (1.18)	430 (16.93)						100 (220)	98 (216)	102 (225)
		PN40	515 (20.28)		33 (1.30)	450 (17.72)	600 (23.62)					130 (287)	128 (282)	132 (291)
	JIS B2220	5K	430 (16.93)	12	23 (0.91)	390 (15.35)	500 (19.69)					80 (176)	78 (172)	82 (181)
		10K	445 (17.52)	16	25 (0.98)	400 (15.75)								
	AS4087	PN16	455 (17.91)	12	22 (0.87)	406 (15.98)								
		PN35	490 (19.29)	26	26 (1.02)	438 (17.24)						130 (287)	128 (282)	132 (291)
	ASME B16.5	CL300	520 (20.47)	16	32 (1.25)	451 (17.75)						150 (331)	148 (326)	152 (336)
		CL150	485 (19.09)	12	26 (1.02)	432 (17.00)						105 (231)	103 (227)	107 (236)
DN350 (14 in.)	EN 1092 or DIN	PN10	505 (19.88)	16	22 (0.87)	460 (18.11)	550 (21.65)	357 (14.06)	348 (13.70)	507 (19.96)	N/A	95 (209)	93 (205)	97 (214)
		PN16	520 (20.47)		26 (1.02)	470 (18.50)						110 (243)	108 (238)	112 (247)
		PN25	555 (21.85)		33 (1.30)	490 (19.29)						145 (320)	143 (315)	147 (324)
		PN40	580 (22.83)		36 (1.42)	510 (20.08)	650 (25.59)					195 (430)	193 (425)	197 (435)
	JIS B2220	5K	480 (18.90)	12	22 (0.87)	435 (17.13)	550 (21.65)					95 (209)	93 (205)	97 (214)
		10K	490 (19.29)	16	25 (0.98)	445 (17.52)								
	AS4087	PN16	525 (20.67)	12	26 (1.02)	470 (18.50)						130 (287)	128 (282)	132 (291)
		PN35	550 (21.65)	16	30 (1.18)	495 (19.49)						185 (408)	183 (403)	187 (412)
	ASME B16.5	CL300	585 (23.03)	20	32 (1.25)	514(20.25)						140 (309)	138 (304)	142 (314)
		CL150	535 (21.06)	12	29 (1.14)	476 (18.75)						105 (231)	103 (227)	107 (236)
DN400 (16 in.)	EN 1092 or DIN	PN10	565 (22.24)	16	26 (1.02)	515 (20.28)	600 (23.62)	399 (15.71)	390 (15.35)	549 (21.61)	N/A	103 (227)	101 (223)	105 (232)
		PN16	580 (22.83)		30 (1.18)	525 (20.67)						126 (278)	124 (273)	128 (283)
		PN25	620 (24.41)		36 (1.42)	550 (21.65)						170 (375)	168 (370)	172 (380)
		PN40	660 (25.98)		39 (1.54)	585 (23.03)	650 (25.59)					258 (569)	256 (564)	260 (574)
	JIS B2220	5K	540 (21.26)	12	25 (0.98)	495 (19.49)	600 (23.62)					103 (227)	101 (223)	105 (232)
		10K	560 (22.05)	16	27 (1.06)	510 (20.08)						116 (256)	114 (251)	118 (261)
	AS4087	PN16	580 (22.83)	12	26 (1.02)	521 (20.51)						154 (340)	152 (335)	156 (344)
		PN35	610 (24.02)	20	30 (1.18)	552 (21.73)						302 (666)	300 (661)	304 (670)
	ASME B16.5	CL300	650 (25.59)	24	35 (1.38)	572 (22.50)						265 (584)	263 (580)	267 (589)
		CL150	600 (23.62)	12	29 (1.14)	540 (21.25)						175 (386)	173 (381)	177 (391)

Table 5 F-style sensor – DN 250 to DN 400 (10 to 16 in.)

…5 Installation

…Dimensions

F-style sensor – DN 450 to DN 600 (18 to 24 in.)

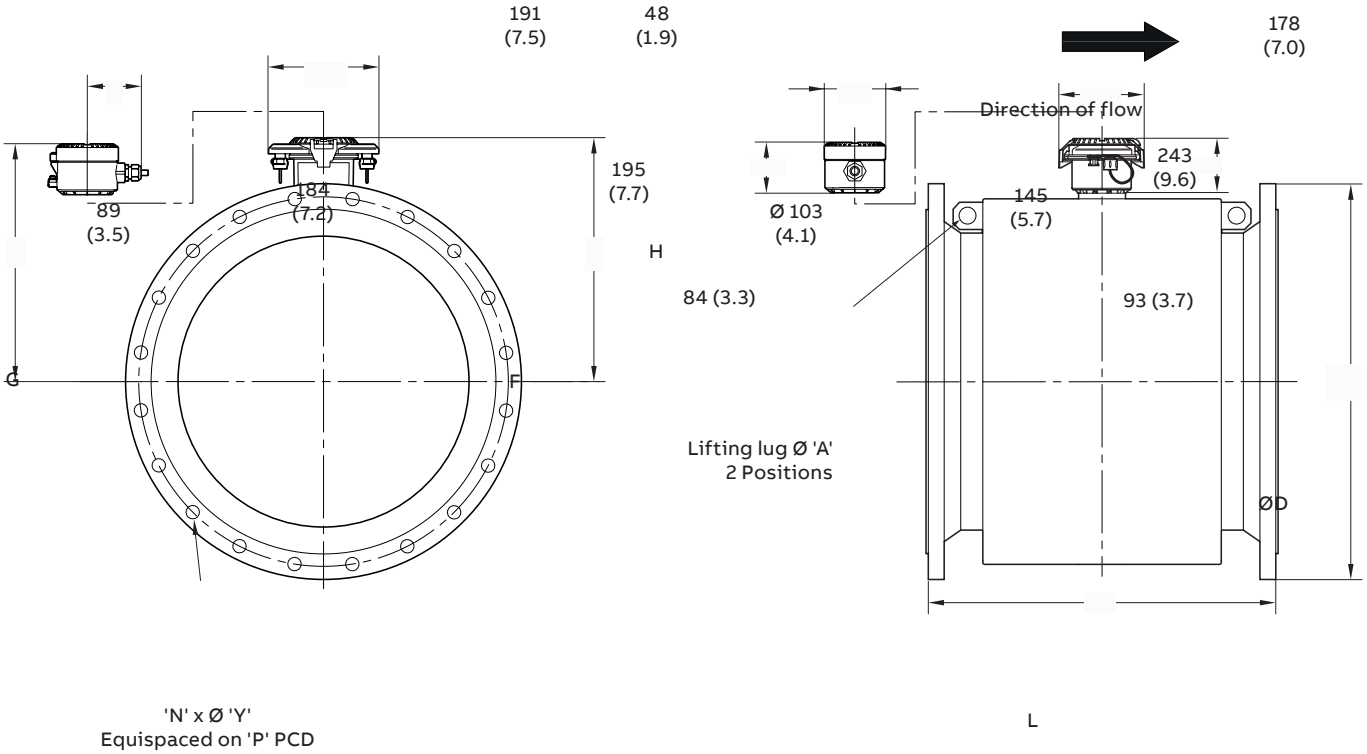


Figure 34 F-style sensor – DN 450 to DN 600 (18 to 24 in.)

Sensor size	Flange		Dimensions in mm (in.)									Approx. weight kg (lbs)		
	Standard	Class	Flange OD	No. holes	Bolt hole dia.	Bolt hole PCD	Sensor length	Tx. height	T. box height	Tx. height	Lifting lug	Integral FEW411/ FEW431	Remote	Integral FEW451
			D	N	Y	P	L	F	G	H	A			
DN450 (18 in.)	EN 1092 or DIN	PN10	615 (24.21)	20	26 (1.02)	565 (22.24)	600 (23.62)	407 (16.02)	398 (15.67)	557 (21.93)	30 (1.18)	173 (381)	171 (377)	175 (386)
		PN16	640 (25.20)		30 (1.18)	585 (23.03)						188 (414)	186 (410)	190 (419)
		PN25	670 (26.38)		36 (1.42)	600 (23.62)	686 (27.01)					245 (540)	243 (536)	247 (545)
		PN40	685 (26.97)		39 (1.54)	610 (24.02)						315 (694)	313 (690)	317 (699)
	JIS B2220	5K	605 (23.82)	16	25 (0.98)	555 (21.85)	600 (23.62)					165 (364)	163 (359)	167 (369)
		10K	620 (24.41)	20	27 (1.06)	565 (22.24)						177 (390)	175 (386)	179 (395)
	AS4087	PN16	640 (25.20)	12	26 (1.02)	584 (22.99)						232 (511)	230 (507)	234 (516)
		PN35	675 (26.57)	20	33 (1.30)	610 (24.02)						328 (723)	326 (719)	330 (728)
	ASME B16.5	CL300	710 (27.95)	24	35 (1.38)	629 (24.75)						368 (811)	366 (807)	370 (816)
		CL150	635 (25.00)	16	32 (1.26)	578 (22.75)						250 (551)	248 (547)	252 (556)
DN500 (20 in.)	EN 1092 or DIN	PN10	670 (26.38)	20	26 (1.02)	620 (24.41)	600 (23.62)	407 (16.02)	398 (15.67)	557 (21.93)	30 (1.18)	190 (419)	188 (414)	192 (424)
		PN16	715 (28.15)		33 (1.30)	650 (25.59)						240 (529)	238 (525)	242 (534)
		PN25	730 (28.74)		36 (1.42)	660 (25.98)	700 (27.56)					300 (661)	298 (657)	302 (666)
		PN40	755 (29.72)		42 (1.65)	670 (26.38)	762 (30.00)					392 (864)	390 (860)	394 (869)
	JIS B2220	5K	655 (25.79)		25 (0.98)	605 (23.82)	600 (23.62)					190 (419)	188 (414)	192 (424)
		10K	675 (26.57)		27 (1.06)	620 (24.41)								
	AS4087	PN16	705 (27.76)	16	26 (1.02)	641 (25.24)						290 (639)	288 (635)	292 (644)
		PN35	735 (28.94)	24	33 (1.30)	673 (26.50)						435 (959)	433 (955)	437 (964)
	ASME B16.5	CL150	700 (27.56)	20	32 (1.26)	635 (25.00)						300 (661)	298 (657)	302 (666)
		CL300	775 (30.51)	24	35 (1.38)	659 (25.94)	762 (30.00)					490 (1080)	488 (1076)	492 (1085)
DN600 (24 in.)	EN 1092 or DIN	PN10	780 (30.71)	20	30 (1.18)	725 (28.54)	800 (31.50)	458 (18.03)	449 (17.68)	608 (23.94)	30 (1.18)	284 (626)	282 (622)	286 (631)
		PN16	840 (33.07)		36 (1.42)	770 (30.31)						318 (701)	316 (697)	320 (706)
		PN25	845 (33.27)		39 (1.54)	770 (30.31)						460 (1014)	458 (1010)	462 (1019)
		PN40	890 (35.04)		26 (1.02)	705 (27.76)	890 (35.04)					600 (1323)	598 (1318)	602 (1328)
	JIS B2220	5K	770 (30.31)		27 (1.06)	715 (28.15)	800 (31.50)					275 (606)	273 (602)	277 (611)
		10K	795 (31.30)	24	33 (1.30)	730 (28.74)						306 (675)	304 (670)	308 (679)
	AS4087	PN16	825 (32.48)	16	30 (1.18)	756 (29.76)						382 (842)	380 (838)	384 (847)
		PN35	850 (33.46)	24	36 (1.42)	781 (30.75)						452 (996)	450 (992)	454 (1001)
	ASME B16.5	CL300	915 (36.02)	24	41 (1.61)	813 (32.00)						550 (1213)	548 (1208)	552 (1217)
		CL150	815 (32.09)	20	35 (1.38)	750 (29.50)						425 (937)	423 (933)	427 (942)

Table 6 F-style sensor – DN 450 to DN 600 (18 to 24 in.)

…5 Installation

…Dimensions

F-style sensor – DN 700 to DN 2400 (28 to 96 in.)

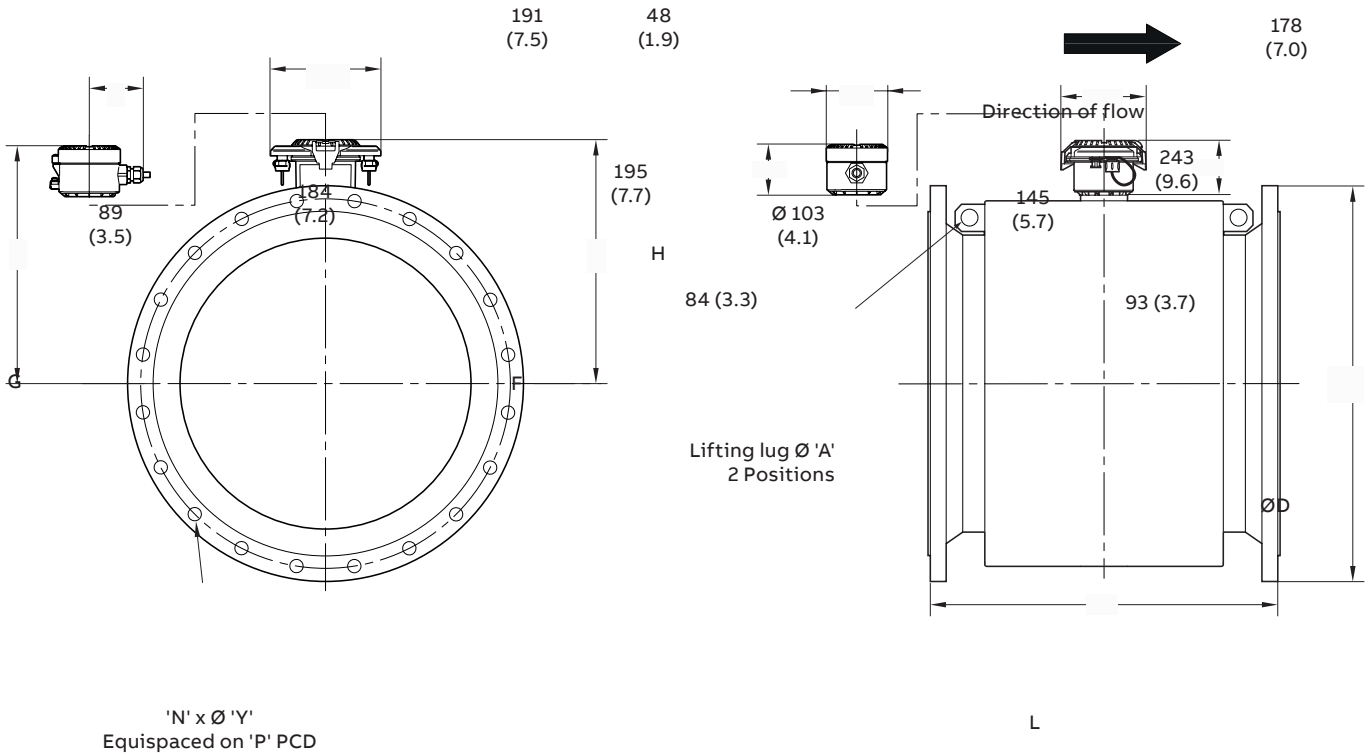


Figure 35 F-style sensor – DN 700 to DN 2400 (28 to 96 in.)

Sensor size	Flange		Dimensions in mm (in.)									Approx. weight kg (lbs)		
	Standard	Class	Flange OD	No. holes	Bolt hole dia.	Bolt hole PCD	Sensor length	Tx. height	T. box height	Tx. height	Lifting lug	Integral FEW411/ FEW431	Remote	Integral FEW451
			D	N	Y	P	L	F	G	H	A			
DN700 (28 in.)	JIS	5K	875 (34.45)	24	27 (1.06)	820 (32.28)	700 (27.56)	497 (19.57)	492 (19.37)	647 (25.47)	30 (1.18)	213 (470)	211 (466)	215 (474)
		10K	905 (35.63)		33 (1.30)	840 (33.07)						251 (554)	249 (549)	253 (558)
	EN 1092 or DIN	PN6	860 (33.86)		26 (1.02)	810 (31.89)						187 (413)	185 (408)	189 (417)
		PN10	895 (35.24)		30 (1.18)	840 (33.07)						235 (519)	233 (514)	237 (523)
		PN16	910 (35.83)		36 (1.42)	840 (33.07)						270 (596)	268 (591)	272 (600)
		PN25	960 (37.80)		42 (1.65)	875 (34.45)	800 (31.50)					419 (924)	417 (920)	421 (929)
		PN40	995 (39.17)		48 (1.89)	900 (35.43)	910 (35.83)					632 (1394)	630 (1389)	634 (1398)
	AWWA C207	CLASS B	927 (36.50)	28	32 (1.26)	864 (34.02)	700 (27.56)					247 (545)	245 (541)	249 (549)
		CLASS D	927 (36.50)									270 (596)	268 (591)	272 (600)
		CLASS E	927 (36.50)		32 (1.26)	864 (34.02)	762 (30.00)					434 (957)	432 (953)	436 (962)
		CLASS F	1035 (40.75)		44 (1.73)	940 (37.01)						674 (1486)	672 (1482)	676 (1491)
	AS 4087	PN16	910 (35.83)	20	30 (1.18)	845 (33.27)	700 (27.56)					356 (785)	354 (781)	358 (790)
		PN35	935 (36.81)	24	36 (1.42)	857 (33.74)	910 (35.83)					584 (1288)	582 (1284)	586 (1292)
	AS 2129	TABLE D	910 (35.83)	20	30 (1.18)	845 (33.27)	910 (35.83)					308 (680)	306 (675)	310 (684)
		TABLE E			33 (1.30)		700 (27.56)					274 (605)	272 (600)	276 (609)
	ASME B16.5	CL150 SERIES A	925 (36.42)	28	35 (1.38)	864 (34.00)	790 (31.10)					454 (1001)	452 (997)	456 (1006)
		CL150 SERIES B	835 (32.87)	40	22 (0.87)	795 (31.31)	910 (35.83)					368 (812)	366 (807)	370 (816)
	ASME B16.5	CL300 SERIES A	1035 (40.75)	28	45 (1.75)	940 (37.00)	940 (37.01)					1002 (2210)	1000 (2205)	1004 (2214)
		CL300 SERIES B	920 (36.22)	36	35 (1.38)	857 (33.75)	910 (35.83)					680 (1500)	678 (1495)	682 (1504)

Table 7 F-style sensor – DN 700 (28 in.)

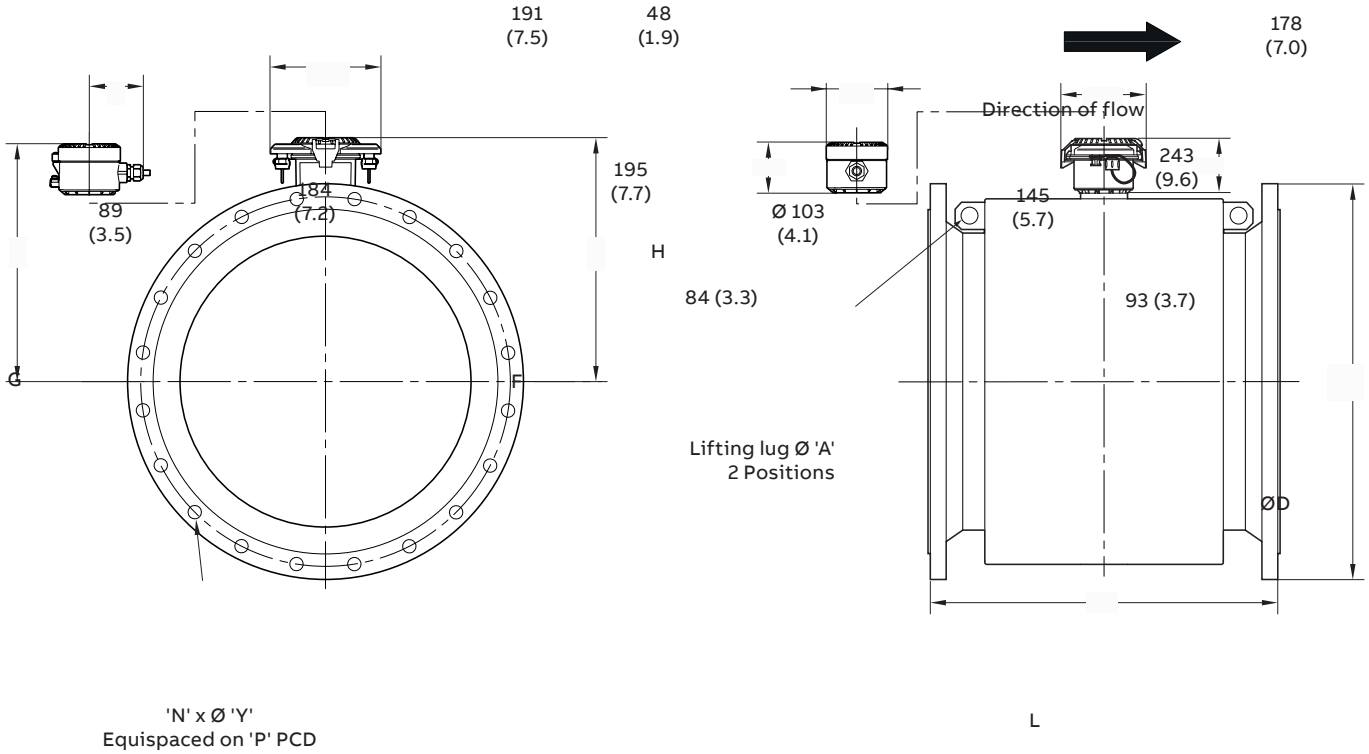
Sensor size	Flange		Dimensions in mm (in.)									Approx. weight kg (lbs)		
	Standard	Class	Flange OD	No. holes	Bolt hole dia.	Bolt hole PCD	Sensor length	Tx. height	T. box height	T. box height	Lifting lug	Integral FEW411/ FEW431	Remote	Integral FEW451
			D	N	Y	P	L	F	G	H	A			
DN750 (30 in.)	JIS	JIS5K	945 (37.20)	24	33 (1.30)	880 (34.65)	762 (30.00)	523 (20.59)	518 (20.39)	673 (26.5)	30 (1.18)	245 (541)	243 (536)	247 (545)
		JIS10K	970 (38.19)			900 (35.43)						317 (699)	315 (695)	319 (704)
	AWWA C207	CLASS B	984 (38.74)	28	32 (1.26)	914 (35.98)						268 (591)	266 (587)	270 (596)
		CLASS D	984 (38.74)									322 (710)	320 (706)	324 (715)
		CLASS E	984 (38.74)		32 (1.26)							472 (1041)	470 (1037)	474 (1045)
		CLASS F	1092 (42.99)		44 (1.73)	997 (39.25)						755 (1665)	753 (1661)	757 (1669)
	AS 4087	PN16	995 (39.17)	20	33 (1.30)	927 (36.50)						410 (904)	408 (900)	412 (909)
		PN35	1015 (39.96)	28	36 (1.42)	940 (37.01)	990 (38.98)					713 (1572)	711 (1568)	715 (1577)
	AS 2129	TABLE D	995 (39.17)	20	33 (1.30)	927 (36.50)	990 (38.98)					390 (860)	388 (856)	392 (865)
		TABLE E	995 (39.17)		36 (1.42)		762 (30.00)					350 (772)	348 (768)	352 (777)
	ASME B16.5	CL150 SERIES A	985 (38.78)	28	35 (1.38)	914 (36.00)	830 (32.67)					505 (1114)	503 (1109)	507 (1118)
		CL150 SERIES B	885 (34.84)	44	22 (0.87)	846 (33.31)	990 (38.98)					368 (812)	366 (807)	370 (816)
	ASME B16.5	CL300 SERIES A	1090 (42.91)	28	48 (1.87)	997 (39.25)	975 (38.39)					1002 (2210)	1000 (2205)	1004 (2214)
		CL300 SERIES B	990 (38.98)	36	38 (1.50)	921 (36.25)	990 (38.98)					797 (1758)	795 (1753)	799 (1762)
DN800 (32 in.)	JIS	JIS5K	995 (39.17)	24	33 (1.30)	930 (36.61)	800 (31.50)	547 (21.54)	542 (21.34	697 (27.44)	30 (1.18)	280 (618)	278 (613)	282 (622)
		JIS10K	1020 (40.16)	28	33 (1.30)	950 (37.40)						328 (724)	326 (719)	330 (728)
	EN 1092 or DIN	PN6	975 (38.39)	24	30 (1.18)	920 (36.22)						239 (527)	237 (523)	241 (532)
		PN10	1015 (39.96)	34	33 (1.30)	950 (37.40)						312 (688)	310 (684)	314 (693)
		PN16	1025 (40.35)	24	39 (1.54)	950 (37.40)	800 (31.50)					366 (807)	364 (803)	368 (812)
		PN25	1085 (42.72)		48 (1.89)	990 (38.98)	950 (37.40)					599 (1321)	597 (1317)	601 (1325)
		PN40	1140 (44.88)		56 (2.20)	1030 (40.55)	1040 (40.94)					919 (2027)	917 (2022)	921 (2031)
	AWWA C207	CLASS B	1060 (41.73)	28	38 (1.50)	978 (38.50)	800 (31.50)					334 (737)	332 (732)	336 (741)
		CLASS D	1060 (41.73)									394 (869)	392 (865)	396 (874)
		CLASS E	1060 (41.73)		38 (1.50)	978 (38.50)	880 (34.65)					591 (1303)	589 (1299)	593 (1308)
		CLASS F	1150 (45.28)		44 (1.73)	1054 (41.50)						886 (1954)	884 (1949)	888 (1958)
	AS 4087	PN16	1060 (41.73)	20	36 (1.42)	984 (38.74)	800 (31.50)					482 (1063)	480 (1059)	484 (1068)
		PN35	1060 (41.73)	28	36 (1.42)	984 (38.74)	1040 (40.94)					802 (1769)	800 (1764)	804 (1773)
	AS2129	TABLE D	1060 (41.73)	20			1040 (40.94)					440 (971)	438 (966)	442 (975)
		TABLE E	1060 (41.73)				800 (31.50)					410 (904)	408 (900)	412 (909)
	ASME B16.5	CL150 SERIES A	1060 (41.73)	28	41 (1.63)	978 (38.50)	950 (37.40)					674 (1486)	672 (1482)	676 (1491)
		CL150 SERIES B	940 (37.01)	48	22 (0.87)	900 (35.44)	1040 (40.94)					456 (1006)	454 (1001)	458 (1010)
	ASME B16.5	CL300 SERIES A	1150 (45.28)	28	51 (2.01)	1054 (41.50)	1120 (44.09)					1219 (2688)	1217 (2684)	1221 (2692)
		CL300 SERIES B	1055 (41.54)	32	41 (1.63)	978 (38.50)	1040 (40.94)					985 (2172)	983 (2168)	987 (2176)
DN900 (36 in.)	JIS	JIS5K	1095 (43.11)	24	33 (1.30)	1030 (40.55)	900 (35.43)	598 (23.54)	593 (23.35)	748 (29.45)	30 (1.18)	347 (766)	345 (761)	349 (770)
		JIS10K	1120 (44.09)	28	33 (1.30)	1050 (41.34)						419 (924)	417 (920)	421 (929)
	EN 1092 or DIN	PN6	1075 (42.32)	24	30 (1.18)	1020 (40.16)						300 (662)	298 (657)	302 (666)
		PN10	1115 (43.90)	28	33 (1.30)	1050 (41.34)						396 (874)	394 (869)	398 (878)
		PN16	1125 (44.29)		39 (1.54)	1050 (41.34)						485 (1070)	483 (1065)	487 (1074)
		PN25	1185 (46.65)		48 (1.89)	1090 (42.91)	1040 (40.94)					757 (1669)	755 (1665)	759 (1674)
		PN40	1250 (49.21)		56 (2.20)	1140 (44.88)	1170 (46.06)					1219 (2688)	1217 (2684)	1221 (2692)
	AWWA C207	CLASS B	1168 (45.98)	32	38 (1.50)	1086 (42.76)	900 (35.43)					397 (876)	395 (871)	399 (880)
		CLASS D										436 (962)	434 (957)	438 (966)
		CLASS E										744 (1641)	742 (1636)	746 (1645)
		CLASS F	1270 (50.00)		51 (2.01)	1168 (45.98)						1064 (2346)	1062 (2342)	1066 (2351)
	AS 4087	PN16	1175 (46.26)	24	36 (1.42)	1092 (42.99)						686 (1513)	684 (1508)	688 (1517)
		PN35	1185 (46.65)	32	39 (1.54)	1105 (43.50)	1170 (46.06)					1103 (2432)	1101 (2428)	1105 (2437)
	AS 2129	TABLE D	1175 (46.26)	24	36 (1.42)	1092 (42.99)	1170 (46.06)					574 (1266)	572 (1262)	576 (1270)
		TABLE E					900 (35.43)					580 (1279)	578 (1275)	582 (1284)
	ASME B16.5	CL150 SERIES A	1170 (46.06)	32	41.3 (1.63)	1086 (42.75)	1120 (44.09)					933 (2057)	931 (2053)	935 (2062)
		CL150 SERIES B	1055 (41.54)	44	25.4 (1.00)	1010 (39.75)	1170 (46.06)					655 (1445)	653 (1440)	657 (1449)
	ASME B16.5	CL300 SERIES A	1270 (50.00)	32	54 (2.13)	1168 (46.00)	1180 (46.46)					1533 (3380)	1531 (3376)	1535 (3385)
		CL300 SERIES B	1170 (46.06)		44.5 (1.75)	1089 (42.87)	1170 (46.06)					1206 (2659)	1204 (2655)	1208 (2664)

Table 8 F-style sensor – DN 750 to DN 900 (30 to 36 in.)

…5 Installation

…Dimensions

…F-style sensor – DN 700 to DN 2400 (28 to 96 in.)



…Figure 35 F-style sensor – DN 700 to DN 2400 (28 to 96 in.)

Sensor size	Flange		Dimensional in mm (in.)									Approx. weight kg (lbs)		
	Standard	Class	Flange OD	No. holes	Bolt hole dia.	Bolt hole PCD	Sensor length	Trans height	Tx. box height	Tx. box height	Lifting lug			
			D	N	Y	P	L	F	G	H	A	Integral FEW411/ FEW431	Remote	Integral FEW451
DN1000 (40 in.)	JIS	JIS5K	1195 (47.05)	28	33 (1.30)	1130 (44.49)	1000 (39.37)	648 (25.51)	643 (25.31)	798 (31.42)	30 (1.18)	407 (898)	405 (893)	409 (902)
		JIS10K	1235 (48.62)		39 (1.54)	1160 (45.67)						505 (1114)	503 (1109)	507 (1118)
	EN 1092 or DIN	PN6	1175 (46.26)		30 (1.18)	1120 (44.09)						348 (768)	346 (763)	350 (772)
		PN10	1230 (48.43)		36 (1.42)	1160 (45.67)						469 (1034)	467 (1030)	471 (1039)
		PN16	1255 (49.41)		42 (1.65)	1170 (46.06)						613 (1352)	611 (1348)	615 (1356)
		PN25	1320 (51.97)		56 (2.20)	1210 (47.64)	1170 (46.06)					1004 (2214)	1002 (2210)	1006 (2218)
		PN40	1360 (53.54)			1250 (49.21)	1300 (51.18)					1486 (3277)	1484 (3272)	1488 (3281)
	AWWA C207	CLASS B	1289 (50.75)	36	38 (1.50)	1200 (47.24)	1000 (39.37)					474 (1045)	472 (1041)	476 (1050)
		CLASS D	1289 (50.75)									618 (1363)	616 (1359)	620 (1367)
		CLASS E	1289 (50.75)									922 (2033)	920 (2029)	924 (2038)
		CLASS F	1378 (54.25)		51 (2.01)	1276 (50.24)						1300 (2867)	1298 (2862)	1302 (2871)
	AS 4087	PN16	1255 (49.41)	24	36 (1.42)	1175 (46.26)						740 (1632)	738 (1628)	742 (1636)
		PN35	1275 (50.20)	36	39 (1.54)	1194 (47.01)	1300 (51.18)					1316 (2902)	1314 (2897)	1318 (2906)
	AS 2129	TABLE D	1255 (49.41)	24	36 (1.42)	1175 (46.26)	1300 (51.18)					682 (1504)	680 (1500)	684 (1508)
		TABLE E	1255 (49.41)		39 (1.54)		1000 (39.37)					652 (1438)	650 (1434)	654 (1442)
	ASME B16.5	CL150 SERIES A	1290 (50.79)	36	41 (1.63)	1200 (47.25)	1090 (42.91)					1034 (2280)	1032 (2276)	1036 (2284)
		CL150 SERIES B	1175 (46.26)	44	29 (1.13)	1121 (44.13)	1300 (51.18)					809 (1784)	807 (1780)	811 (1788)
	ASME B16.5	CL300 SERIES A	1240 (48.82)	32	45 (1.75)	1156 (45.50)	1150 (45.28)					1287 (2838)	1285 (2833)	1289 (2842)
		CL300 SERIES B	1275 (50.20)	40		1191 (46.87)	1300 (51.18)					1560 (3440)	1558 (3435)	1562 (3444)

Table 9 F-style sensor – DN 1000 (40 in.)

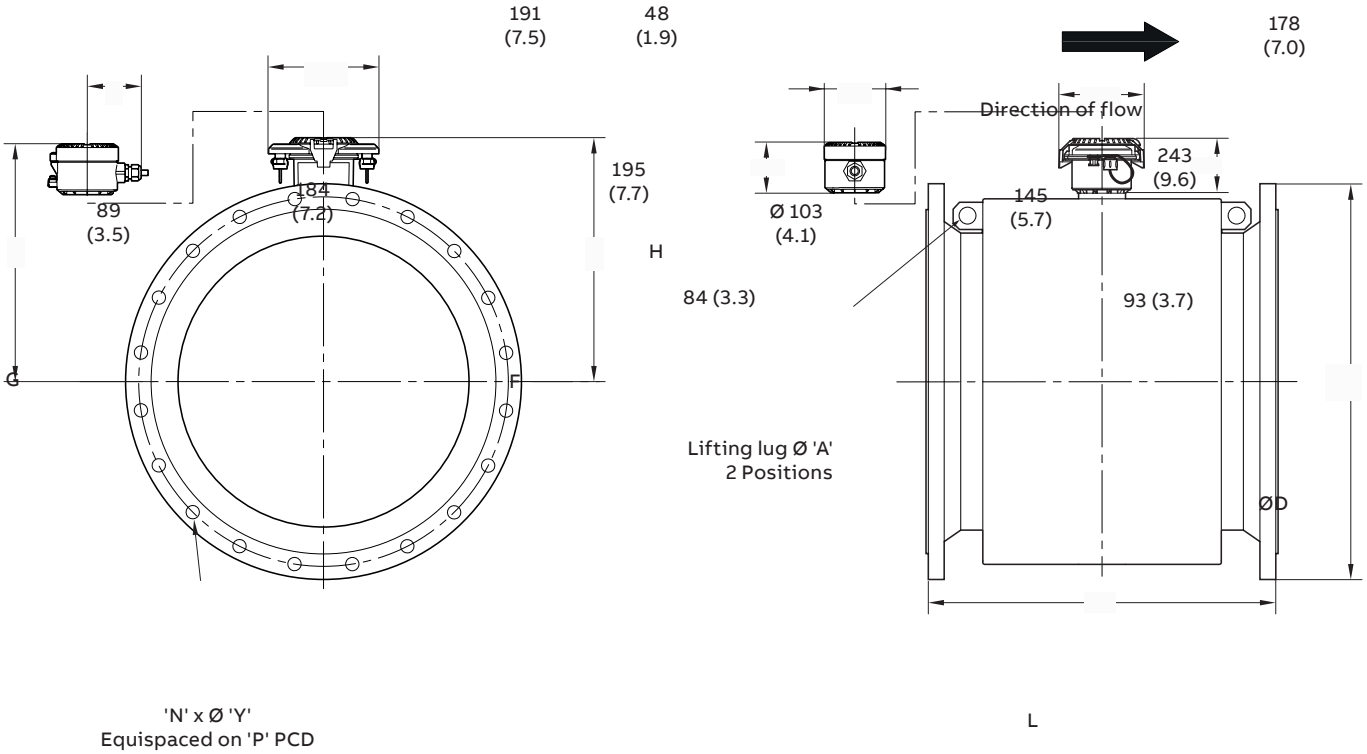
Sensor size	Flange		Dimensional in mm (in.)									Approx. weight kg (lbs)		
	Standard	Class	Flange OD	No. holes	Bolt hole dia.	Bolt hole PCD	Sensor length	Trans height	Tx. height	Tx. height	Lifting lug			
			D	N	Y	P	L	F	G	H	A	Integral FEW411/ FEW431	Remote	Integral FEW451
DN1050 (42 in.)	AWWA C207	CLASS B	1346 (52.99)	36	38 (1.50)	1257 (49.49)	1067 (42.01)	701 (27.6)	697 (27.44)	851 (33.5)	30 1.18)	559 (1233)	557 (1228)	561 (1237)
		CLASS D										614 (1354)	612 (1350)	616 (1359)
		CLASS E										1102 (2430)	1100 (2426)	1104 (2434)
		CLASS F	1448 (57.01)		51 (2.01)	1340 (52.76)						1522 (3356)	1520 (3352)	1524 (3360)
	ASME B16.5	CL150 SERIES A	1345 (52.95)		41.3 (1.63)	1257 (49.50)						1200 (2646)	1198 (2642)	1202 (2650)
		CL150 SERIES B	1225 (48.23)	48	28.6 (1.13)	1172 (46.13)	1365 (53.74)					910 (2007)	908 (2002)	912 (2011)
	ASME B16.5	CL300 SERIES A	1290 (50.79)	32	44.5 (1.75)	1207 (47.50)	1170 (46.06)					1432 (3158)	1430 (3153)	1434 (3162)
		CL300 SERIES B	1335 (52.56)	36	47.6 (1.87)	1245 (49.00)	1365 (53.74)					1804 (3978)	1802 (3973)	1806 (3982)
DN1100 (44 in.)	JIS	JIS5K	1305 (51.38)	28	33 (1.30)	1240 (48.82)	1118 (44.02)	701 (27.60)	697 (27.44)	851 (33.5)	30 (1.18)	478 (1054)	476 (1050)	480 (1059)
		JIS10K	1345 (52.95)		39 (1.54)	1270 (50.00)						679 (1497)	677 (1493)	681 (1502)
	AWWA C207	CLASS B	1403 (55.24)	40	38 (1.50)	1315 (51.77)						605 (1334)	603 (1330)	607 (1339)
		CLASS D	1403 (55.24)									695 (1533)	693 (1528)	697 (1537)
		CLASS E	1404 (55.28)	40	38 (1.50)							1132 (2496)	1130 (2492)	1134 (2501)
		CLASS F	1505 (59.25)	36	51 (2.01)	1397 (55.00)						1640 (3616)	1638 (3612)	1642 (3620)
DN1200 (48 in.)	JIS	5K	1420 (55.91)	32	33 (1.30)	1350 (53.15)	1200 (47.24)	753 (29.65)	748 (29.49)	903 (35.55)	30 (1.18)	653 (1440)	651 (1436)	655 (1445)
		10K	1465 (57.68)		39 (1.54)	1380 (54.33)						819 (1806)	817 (1802)	821 (1810)
	EN 1092 or DIN	PN6	1405 (55.31)		33 (1.30)	1340 (52.76)						538 (1187)	536 (1182)	540 (1191)
		PN10	1455 (57.28)		39 (1.54)	1380 (54.33)						753 (1661)	751 (1656)	755 (1665)
		PN16	1485 (58.46)		48 (1.89)	1390 (54.72)						981 (2163)	979 (2159)	983 (2168)
		PN25	1530 (60.24)		56 (2.20)	1420 (55.91)	1560 (61.42)					1654 (3647)	1652 (3643)	1656 (3651)
		PN40	1575 (62.01)		62 (2.44)	1460 (57.48)						2229 (4915)	2227 (4910)	2231 (4919)
	AWWA C207	CLASS B	1511 (59.49)	44	38 (1.50)	1422 (55.98)	1200 (47.24)					746 (1645)	744 (1641)	748 (1650)
		CLASS D	1511 (59.49)									886 (1954)	884 (1949)	888 (1958)
		CLASS E	1511 (59.49)		38 (1.50)	1422 (55.98)						1389 (3063)	1387 (3058)	1391 (3067)
		CLASS F	1651 (65.00)	40	51 (2.01)	1543 (60.75)						2300 (5071)	2298 (5067)	2302 (5076)
	AS 4087	PN16	1490 (58.66)	32	36 (1.42)		1200 (47.24)					1207 (2661)	1205 (2657)	1209 (2666)
	AS 2129	TABLE-D	1490 (58.66)	32	36 (1.42)	1410 (55.51)	1560 (61.42)					1118 (2465)	1116 (2461)	1120 (2470)
		TABLE-E	1490 (58.66)	32	39 (1.54)		1200 (47.24)					1085 (2393)	1083 (2388)	1087 (2397)
	AS 4087	PN35	1530 (60.24)	40	42 (1.65)	1441 (56.73)	1560 (61.42)					2211 (4875)	2209 (4871)	2213 (4879)
	ASME CL150	SERIES A	1510 (59.45)	44	41 (1.63)	1422 (56.00)	1320 (51.97)					1612 (3554)	1610 (3550)	1614 (3559)
		SERIES B	1390 (54.72)		32 (1.25)	1335 (52.56)	1560 (61.42)					1178 (2598)	1176 (2593)	1180 (2602)
	ASME CL300	SERIES A	1465 (57.68)	32	51 (2.01)	1372 (54.00)	1400 (55.12)					2051 (4522)	2049 (4518)	2053 (4527)
		SERIES B	1510 (59.45)	40	51 (2.01)	1416 (55.75)	1560 (61.42)					2446 (5393)	2444 (5389)	2448 (5397)
DN1350 (54 in.)	AWWA C207	CLASS B	1683 (66.26)	44	44 (1.73)	1594 (62.76)	1350 (53.15)	848 (33.39)	843 (33.19)	998 (39.29)	45 (1.77)	942 (2077)	940 (2073)	944 (2082)
		CLASS D										1026 (2262)	1024 (2258)	1028 (2267)
		CLASS E										1834 (4044)	1832 (4039)	1836 (4048)
DN1400 (56 in.)	EN 1092 or DIN	PN6	1630 (64.17)	36	36 (1.42)	1560 (61.42)	1400 (55.12)	848 (33.39)	843 (33.19)	998 (39.29)	45 (1.77)	774 (1707)	772 (1702)	776 (1711)
		PN10	1675 (65.94)		42 (1.65)	1590 (62.60)						1080 (2381)	1078 (2377)	1082 (2386)
		PN16	1685 (66.34)		48 (1.89)							1293 (2851)	1291 (2847)	1295 (2855)
		PN25	1755 (69.09)		62 (2.44)	1640 (64.57)	1820 (71.65)					2483 (5475)	2481 (5470)	2485 (5479)
		PN40	1795 (70.67)		62 (2.44)	1680 (66.14)						3202 (7060)	3200 (7055)	3204 (7064)
	ASME CL150	SERIES A	1745 (68.70)	48	48 (1.87)	1651 (65.00)	1500 (59.06)					2365 (5214)	2363 (5210)	2367 (5219)
		SERIES B	1600 (62.99)	60	32 (1.25)	1543 (60.75)	1820 (71.65)					1706 (3762)	1704 (3757)	1708 (3766)
	ASME CL300	SERIES A	1710 (67.32)	28	60 (2.37)	1600 (63.00)	1600 (62.99)					3166 (6980)	3164 (6976)	3168 (6985)
		SERIES B	1765 (69.49)	36	60 (2.37)	1651 (65.00)	1820 (71.65)					3873 (8539)	3871 (8535)	3875 (8543)

Table 10 F-style sensor – DN 1050 to DN 1400 (42 to 56 in.)

…5 Installation

…Dimensions

…F-style sensor – DN 700 to DN 2400 (28 to 96 in.)



…Figure 35 F-style sensor – DN 700 to DN 2400 (28 to 96 in.)

Sensor size	Flange		Dimensional in mm (in.)									Approx. weight kg (lbs)		
	Standard	Class	Flange OD	No. Holes	Bolt Hole Dia	Bolt Hole PCD	Sensor length	Trans Height	Tx. Height	Tx. Height	Lifting Lug			
			D	N	Y	P	L	F	G	H	A	Integral FEW411/ FEW431	Remote	Integral FEW451
DN1500 (60 in.)	JIS	5K	1730 (68.11)	36	33 (1.30)	1660 (65.35)	1524 (60.00)	958 (37.72)	953 (37.52)	1108 (43.62)	45 (1.77)	1137 (2507)	1135 (2503)	1139 (2512)
		10K	1795 (70.67)	40	45 (1.77)	1700 (66.93)						1568 (3457)	1566 (3453)	1570 (3462)
	AWWA C207	CLASS B	1854 (72.99)	52	44 (1.73)	1759 (69.25)						1290 (2844)	1288 (2840)	1292 (2849)
		CLASS D	1854 (72.99)									1569 (3460)	1567 (3455)	1571 (3464)
		CLASS E	1854 (72.99)									2497 (5505)	2495 (5501)	2499 (5510)
	ASME CL150	SERIES A	1855 (73.03)		47.6 (1.87)							2847 (6277)	2845 (6273)	2849 (6281)
		SERIES B	1725 (67.91)		35 (1.38)	1662 (65.44)	1950 (76.77)					2031 (4478)	2029 (4474)	2033 (4482)
	ASME CL300	SERIES A	1810 (71.26)	32	60 (2.37)	1702 (67.00)	1640 (64.57)					3717 (8195)	3715 (8191)	3719 (8199)
		SERIES B	1880 (74.02)	40	60 (2.37)	1764 (69.44)	1950 (76.77)					4181 (9218)	4179 (9214)	4183 (9222)
DN1600 (64 in.)	EN 1092 or DIN	PN6	1830 (72.05)	40	36 (1.42)	1760 (69.29)	1600 (62.99)	959 (37.76)	954 (37.56)	1109 (43.66)	45 (1.77)	1033 (2278)	1031 (2273)	1035 (2282)
		PN10	1915 (75.39)		48 (1.89)	1820 (71.65)						1509 (3327)	1507 (3323)	1511 (3332)
		PN16	1975 (77.76)		56 (2.20)	1820 (71.65)						1955 (4311)	1953 (4306)	1957 (4315)
		PN25	1930 (75.98)		62 (2.44)	1860 (73.23)	2080 (81.89)					3201 (7057)	3199 (7053)	3203 (7062)
		PN40	2025 (79.72)		70 (2.76)	1900 (74.80)						4375 (9646)	4373 (9641)	4377 (9650)
DN1650 (66 in.)	AWWA C207	CLASS B	2032 (80.00)	52	44(1.75)	1930(75.98)	1650 (64.96)	1009 (39.72)	1004 (39.53)	1159 (45.63)	45 (1.77)	1497 (3301)	1495 (3296)	1499 (3305)
		CLASS D	2032 (80.00)									1763 (3887)	1761 (3883)	1765 (3892)
DN1800 (72 in.)	EN 1092 or DIN	PN6	2045 (80.51)	44	39 (1.54)	1970 (77.56)	1800 (70.87)	1074 (42.28)	1069 (42.09)	1224 (48.19)	45 (1.77)	1356 (2990)	1354 (2986)	1358 (2994)
		PN10	2115 (83.27)		48 (1.89)	2020 (79.53)						1949 (4297)	1947 (4293)	1951 (4302)
		PN16	2130 (83.86)		56 (2.20)							2524 (5565)	2522 (5561)	2526 (5569)
		PN25	2195 (86.42)		70 (2.76)	2070 (81.50)	2340 (92.12)					4422 (9749)	4420 (9745)	4424 (9754)
	AWWA C207	CLASS B	2197 (86.50)	60	44 (1.73)	2096 (82.52)	1800 (70.87)					1833 (4042)	1831 (4037)	1835 (4046)
		CLASS D										2147 (4734)	2145 (4729)	2149 (4738)
DN1950 (78 in.)	AWWA C207	CLASS B	2362 (92.99)	64	51(2.01)	2261(89.02)	1950 (76.77)	1184 (46.61)	1179 (46.42)	1334 (52.52)	45 (1.77)	2312 (5098)	2310 (5093)	2314 (5102)
		CLASS D										2684 (5918)	2682 (5913)	2686 (5922)
DN2000 (80 in.)	EN 1092 or DIN	PN6	2265 (89.17)	48	42 (1.65)	2180 (85.83)	2000 (78.74)	1184 (46.61)	1179 (46.42)	1334 (52.52)	45 (1.77)	1781 (3927)	1779 (3923)	1783 (3931)
		PN10	2325 (91.54)		48 (1.89)	2230 (87.80)						2580 (5688)	2578 (5684)	2582 (5693)
		PN16	2345 (92.32)		62 (2.44)							3230 (7121)	3228 (7117)	3232 (7126)
		PN25	2425 (95.47)		70 (2.76)	2300 (90.55)	2600 (102.36)					5896 (12999)	5894 (12995)	5898 (13003)
DN2100 (84 in.)	AWWA C207	CLASS B	2534 (99.76)	64	51(2.01)	2426 (95.51)	2100 (82.68)	1288 (50.71)	1283 (50.51)	1438 (56.61)	45 (1.77)	2570 (5666)	2568 (5662)	2572 (5671)
		CLASS D										2942 (6486)	2940 (6482)	2944 (6491)
DN2200 (88 in.)	EN 1092 or DIN	PN6	2475 (97.44)	52	42 (1.65)	2390 (94.09)	2200 (86.61)	1288 (50.71)	1283 (50.51)	1438 (56.61)	45 (1.77)	2446 (5393)	2444 (5389)	2448 (5397)
		PN10	2550 (100.39)		56 (2.20)	2440 (96.06)						3202 (7060)	3200 (7055)	3204 (7064)
DN2400 (96 in.)	EN 1092 or DIN	PN6	2685 (105.71)	56	42 (1.65)	2600 (102.36)	2400 (94.49)	1388 (54.65)	1283 (50.51)	1538 (60.55)	45 (1.77)	2846 (6275)	2844 (6270)	2848 (6279)
		PN10	2760 (108.66)		56 (2.20)	2650 (104.33)						4111 (9064)	4109 (9059)	4113 (9068)

Table 11 F-style sensor – DN 1500 to DN 2400 (42 to 96 in.)

...5 Installation

Grounding

The sensor must be cross-bonded to the upstream and downstream pipes. For technical reasons, this potential must be identical to the potential of the metering fluid. The fluid connection is made by installing 2 fluid contact rings (for grounding).

IMPORTANT NOTE

- The sensor must not be connected to a ground spike.
- For bonding connections use ≥4 mm² (<10AWG) cable.

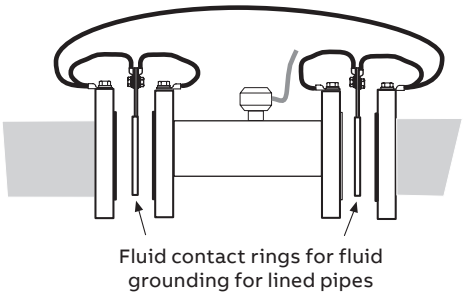


Figure 36 Cross-bonding – all flanged pipes

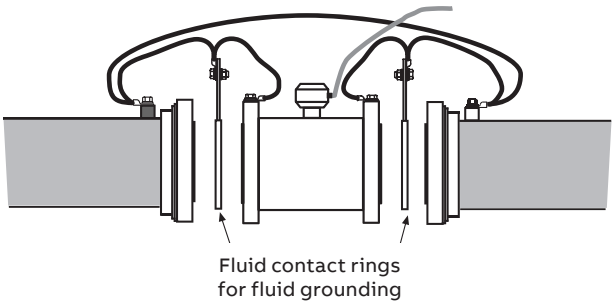


Figure 37 Cross-bonding – flange adapter

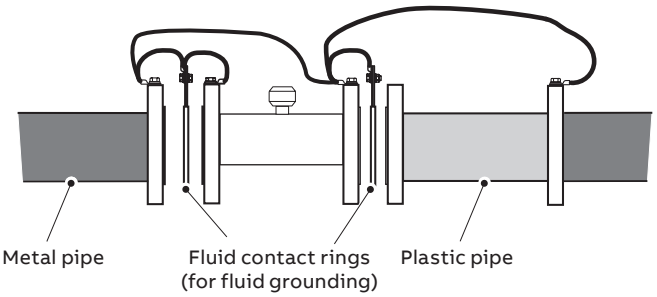


Figure 38 Cross-bonding – plastic pipe insert

Cathodic-protected systems

CAUTION

The grounding arrangement shown in Figure 39 is applicable only to:

- cathodic protected installations
- installations where E2 and E3 are different to E1

Do not ground cathodically-protected pipelines to an external earth.

Incorrect installation will result in fault currents flowing through the meter resulting in unstable readings.

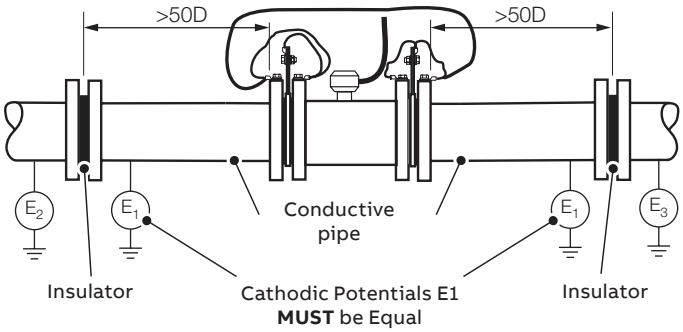


Figure 39 Cathodic-protected installations with different cathodic potential generator

Connections

DANGER – SERIOUS DAMAGE TO HEALTH

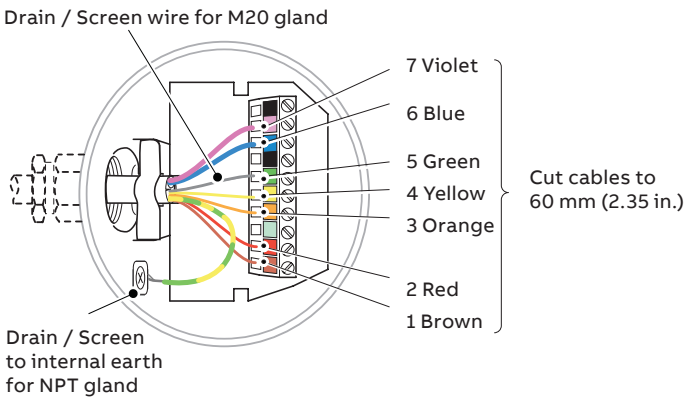
- The mains / line-powered transmitter option is not fitted with a switch – an isolator such as a switch or circuit breaker conforming to local safety standards must be fitted to the final installation. It must be fitted in close proximity to the transmitter, within easy reach of the operator and marked clearly as the isolation mechanism for the transmitter.
- Remove all power from supply, relay, any powered control circuits and high common mode voltages before accessing or making any connections.
- All connections to secondary circuits must have insulation to required local safety standards. After installation, there must be no access to live parts. Use screened cable for signal inputs and relay connections. Route signal leads and power cables separately, preferably in an earthed (grounded) flexible metal conduit.
- Maintain Environmental Protection at all times – see Figure 40.

Signal cable preparation

To prepare the cable for connection at the transmitter and sensor terminal blocks:

- Remove the outer cable insulation and Mylar® wrap.
- Cut the cable connection wires to the lengths shown.
- Ensure the drain wire is sleeved.
- Twist the three screen wires together and sleeve them.
- Keep cable pairs twisted.
- Make connections only as shown.
- Conduit connections must provide cable entry sealing.

Signal cable connection – remote sensors



Signal cable connections

Environmental protection



Figure 40 Potting the sensor terminal box

WARNING

- Potting materials are toxic. Read the manufacturers' instructions carefully before preparing the potting material and use suitable safety precautions.
- Power up and check all connections before potting.
- The remote sensor terminal box connections must be potted immediately on completion to prevent the ingress of moisture.
- Do not overfill or allow the potting material to come into contact with 'O' rings or grooves.
- Do not let potting material enter conduit (if used).

6 Commissioning

Safety instruction

WARNING
Risk of burns due to hot measuring media.
The sensor surface temperature may exceed 70 °C (158 °F), depending on the measuring medium temperature! Before starting work on the sensor, make sure that it has cooled sufficiently.

If there is a chance that safe operation is no longer possible, take the sensor out of operation and secure it against unintended startup.

Checks prior to commissioning

The following points must be checked before commissioning the sensor:

- The wiring must have been completed as described in the **Installation** section on page 10.
- The sensor must be grounded correctly.
- The ambient conditions must meet the requirements set out in the technical data.
- The power supply must meet the requirements printed on the identification plate.
- Checking the correct sensor to transmitter assignment (remote flowmeter only) – see Nameplate on page 10 for sensor label information.

IMPORTANT (NOTE)
The Flow Settings > Mains Noise Rejection Frequency (Hz) setting must match the mains frequency supplied at the point of installation – refer to Operating Instruction OI/FET400-EN.

7 Repair

Spare parts

Common accessories

Ordering code	Description
3KXF221400L0100	FEW4 Sensor cable 5 m (15 ft approx.)
3KXF221400L0200	FEW4 Sensor cable 10 m (30 ft approx.)
3KXF221400L0300	FEW4 Sensor cable 20 m (66 ft approx.)
3KXF221400L0400	FEW4 Sensor cable 30 m (98 ft approx.)
3KXF221400L0500	FEW4 Sensor cable 50 m (164 ft approx.)
3KXF221400L0600	FEW4 sensor cable 100 m junction box/Mil
3KXF221400L0700	FEW4 sensor cable 150 m junction box/Mil
3KXF221400L0800	FEW4 sensor cable 500 m

8 Recycling and disposal

Disassembly

WARNING
Risk of injury due to process conditions
The process conditions – for example, high pressures and temperatures, toxic and aggressive measuring media, can give rise to hazards when dismantling the sensor.

- If necessary, wear suitable personal protective equipment during disassembly.
- Before disassembly, ensure that the process conditions do not pose any safety risks.
- Depressurize and empty the sensor / piping, allow to cool and purge if necessary.

Disposal

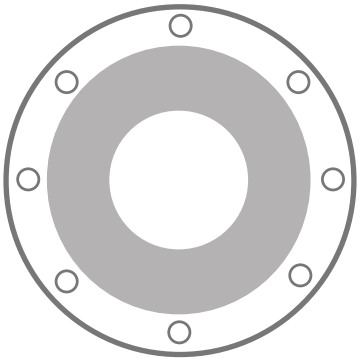
This product and its packaging are manufactured from materials that can be recycled by specialist recycling companies.
Note the following points when disposing of them:

- This product is not subject to WEEE Directive 2012/19/EU or relevant national laws (for example, ElektroG in Germany).
- The product must be surrendered to a specialist recycling company. Do not use municipal garbage collection points.
- According to WEEE Directive 2012/19/EU, only products used in private applications may be disposed of at municipal garbage collection points.
- If it is not possible to dispose of old equipment properly, ABB Service can take receipt of and dispose of returns. Contact your local ABB Sales or Service representatives for a quotation.

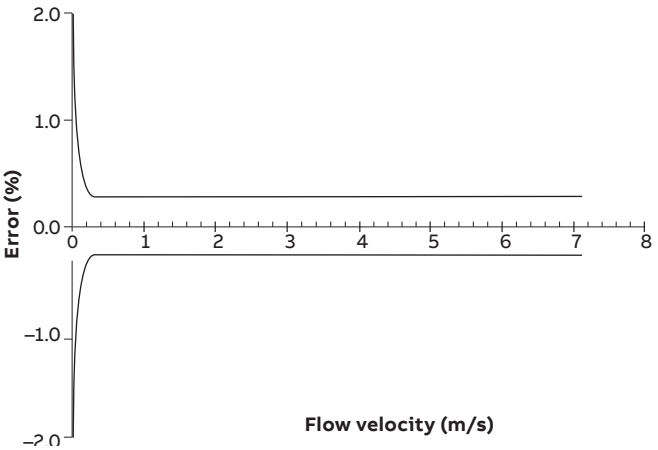
IMPORTANT (NOTE)
Products that are marked with this symbol may not be disposed of through municipal garbage collection points.

9 Specifications

Reduced bore sensor



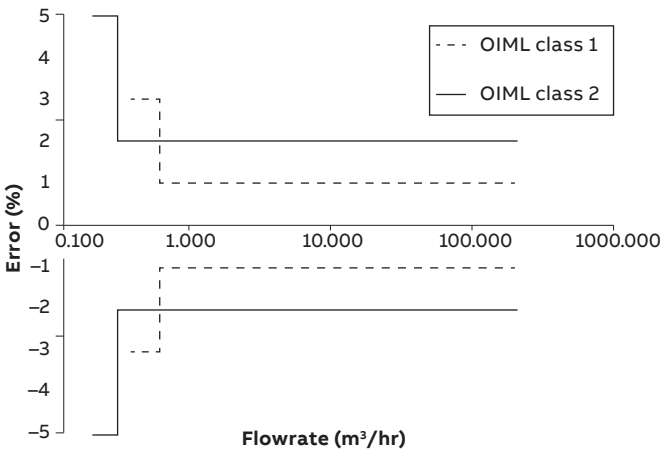
Measurement accuracy



	Mains powered		Battery / renewable energy powered	
DN	**Class 2**	**Class 1**	**Class 2**	**Class 1**
	±0.5 or ±0.4 %	±0.2 %	±0.5 or ±0.4 %	±0.2 %
40 to 600	±1 mm/s*	±0.5 mm/s*	±2 mm/s*	±1 mm/s*

*Whichever is the greater

Metrological performance to OIML R49:2013



			Mains powered		Battery/Renewable energy powered	
			Class 2 (R = 1000)	**Class 1 (R = 500)**	**Class 2 (R = 400)**	**Class 1 (R = 160)**
DN	**in**	**Q3 (m³/h)**	**Q1 (m³/h)**	**Q1 (m³/h)**	**Q1 (m³/h)**	**Q1 (m³/h)**
40	1½	25	0.025	0.05	0.063	0.16
50	2	40	0.04	0.08	0.10	0.25
65	2½	63	0.063	0.13	0.16	0.39
80	3	100	0.10	0.20	0.25	0.63
100	4	160	0.16	0.32	0.40	1
125	5	160	0.16	0.32	0.40	1
150	6	400	0.40	0.80	1	2.50
200	8	630	0.63	1.26	1.58	3.94
250	10	1000	1	2	2.50	6.25
300	12	1600	1.60	3.20	4	10
350	14	1600	1.60	3.20	4	10
400	16	2500	2.50	5	6.25	15.63
450	18	2500	2.50	5	6.25	15.63
500	20	4000	4	8	10	25
600	24	6300	6.30	12.60	15.75	39.38

Q2 = 1.6 * Q1

Q4 = 1.25 * Q3

Q3/Q1 = R

Bore sizes and flange types

Bore size range

DN40 to 600

Flanges to standards

ASME
AWWA
ISO 7005 EN1092-1
DIN
AS4087
AS2129
JIS

Pressure limitations for flanges

As per flange rating

Pressure equipment directive 2014/68/EU

This product is applicable in networks for the supply, distribution and discharge of water and associated equipment and is therefore exempt.

Bore and flange material

- DN40 to 200: SG iron
- DN250 to 600: carbon steel
- All sizes (DN 40 - 600) coated with light grey 2-pack epoxy (RAL9002)
- Primer: Interpon PZ660 zinc-based system, 70 microns thick
- Top coat: Interpon 610 light grey polyester powder coating (RAL 9002), up to 150 microns thick, comparable to EN ISO 12944 grade C4
- As a special requirements: 2-pack epoxy primer / finish @ 300 µm DFT

Terminal box for remote sensors

Polycarbonate

Environmental and process conditions

Ingress rating

- IP68 (NEMA 6P) to 10 m (33 ft) for continuous submersion (Tested for 1500 hours according to IEC 60529)
- For buriable applications: 1 m < sensor depth < 5 m

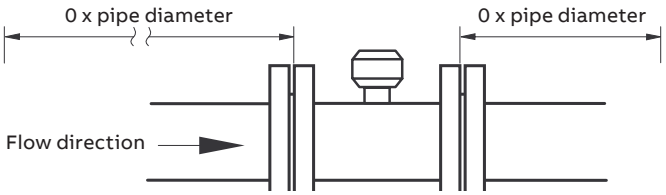
Temperature ranges

Ambient: –25 to 70 °C (–13 to 158°F)
Process: –6 to 70 °C (21 to 158 °F)
Ambient (OIML R49): –25 to 55 °C (–13 to 131 °F)

Conductivity

>20 µS/cm

Upstream and downstream pipe conditions



Pressure loss

Flow rate	Pressure loss in bar (psi)
Q_3	DN40 - 50 < 0.4 (5.8)
Q_3	DN65 - 600 < 0.63 (9.1)
$Q_3/_2$	<0.16 (2.3)

Potable water approvals

WRAS***
ACS (meter approval)
AZ/NZS 4020***
Certified to NSF/ANSI/CAN 61-G (meter approval)

Certified to NSF/ANSI/CAN 61-G

*Applicable only for internal antenna devices of FEX45X and all options of FEX43X

**Applicable for external antenna devices of FEX45X

***Material approval

...9 Specification

Metrological certifications

- OIML R49:2013 for accuracy class 1 and 2 and water temperature class T50 0.1 to 50 °C (32.18 to 122 °F)
- Environmental class: O, M1, E1** and E2*
- MID MI-001
- NMI R49 and NMI 10 for Australia
- PAC for China

			Mains powered			Battery/Renewable energy powered		
			Class 2.5 (R=630)	Class 2 (R = 1000)	Class 1 (R = 500)	Class 2.5 (R = 250)	Class 2 (R = 400)	Class 1 (R = 160)
DN	**in**	**Q3 (m^3/h)**	**Q1 (m^3/h)**	**Q1 (m^3/h)**	**Q1 (m^3/h)**	**Q1 (m^3/h)**	**Q1 (m^3/h)**	**Q1 (m^3/h)**
40	1½	25	0.04	0.025	0.05	0.1	0.062	0.062(3)
50	2	40	0.063	0.04	0.08	0.16	0.1	0.1(3)
65	2½	63	0.1	0.63	0.63(2)	0.252	0.157	0.39
80	3	100	0.159	0.1	0.1(2)	0.4	0.25	0.625
100	4	160	0.254	0.16	0.32	0.64	0.4	1
125	5	160	0.254	0.16	0.32	0.64	0.4	1
150	6	400	0.63	0.4	0.4(2)	1.6	1	1(3)
200	8	630	1	0.63	0.63(2)	2.52	1.575	1.575(3)
250	10	1000	1.59	1	2	4	2.5	6.25
300	12	1600	2.54	1.6	3.2	6.4	4	10
350	14	1600	2.54	1.6	3.2	6.4	4	10
400	16	2500	7.94(7)	5(1)	5	20(8)	12.5(4)	15.63
450	18	2500	7.94(7)	5(1)	5	20(8)	12.5(4)	15.63
500	20	4000	6.35	4	8	63.5(9)	40(5)	100(6)
600	24	6300	10	6.3	12.6	100(9)	63(5)	157.5(6)

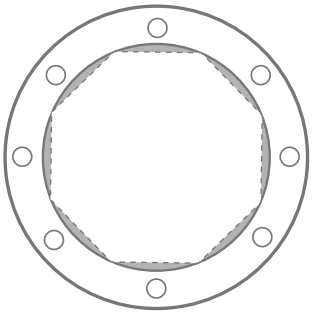
(1) R = 500, (2) R = 1000, (3) R = 400, (4) R = 200, (5) R = 100 (6) R = 40 (7) R=315 (8) R= 125 (9) R=63

Q2 = 1.6 * Q1

Q4 = 1.25 * Q3

Q3/Q1 = R

Full bore sensor



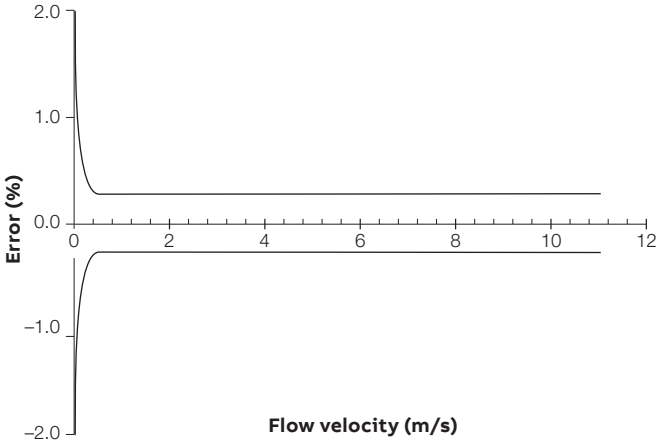
DN40 to 200

Octagonal bore, polypropylene liner

DN250 to 600

Full bore, elastomer or hard rubber liner

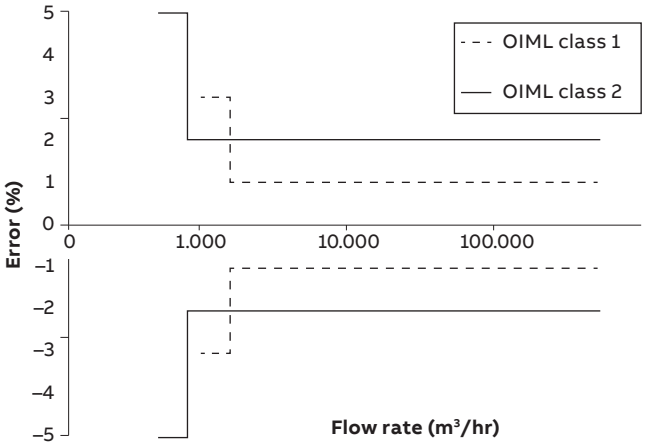
Measurement accuracy



	Mains powered		Battery / renewable energy powered	
DN	**Class 2** ±0.5 or ±0.4 %	**Class 1** ±0.2 %	**Class 2** ±0.5 or ±0.4 %	**Class 1** ±0.2 %
40 to 600	±2 mm/s*	±1 mm/s*	±4 mm/s*	±2 mm/s*
700 to 2600	±4 mm/s*	±2 mm/s*	±6 mm/s*	±3 mm/s*

*Whichever is the greater

Metrological performance to OIML R49:2013



			Mains powered		Battery/Renewable energy powered	
			Class 2 (R = 500)	**Class 1 (R = 250)**	**Class 2 (R = 250)**	**Class 1 (R = 125)**
DN	**in**	**Q3 (m³/h)**	**Q1 (m³/h)**	**Q1 (m³/h)**	**Q1 (m³/h)**	**Q1 (m³/h)**
40	1½	40	0.08	0.16	0.16	0.32
50	2	63	0.13	0.25	0.25	0.50
65	2½	100	0.20	0.40	0.40	0.80
80	3	160	0.32	0.64	0.64	1.28
100	4	250	0.50	1	1	2
125	5	250	0.50	1	1	2
150	6	630	1.26	2.52	2.52	5.04
200	8	1000	2	4	4	8
250	10	1600	3.20	6.40	6.40	12.80
300	12	2500	5	10	10	20
350	14	4000	8	16	16	32
400	16	4000	8	16	16	32
450	18	6300	12.60	25.20	25.20	50.40
500	20	6300	12.60	25.20	25.20	50.40
600	24	10000	20	40	40	80

Q2 = 1.6 * Q1

Q4 = 1.25 * Q3

Q3/Q1 = R

...9 Specification

			Mains powered		Battery/Renewable energy powered	
			Class 2 (R = 315)	Class 1 (R = 160)	Class 2 (R = 160)	Class 1 (R = 80)
DN	in	Q3 (m^3/h)	Q1 (m^3/h)	Q1 (m^3/h)	Q1 (m^3/h)	Q1 (m^3/h)
700	28	16000	50.79	100	100	200
750	30	16000	50.79	100	100	200
800	32	16000	50.79	100	100	200
900	36	25000	79.37	156.20	156.25	312
1000	40	25000	79.37	156.20	156.25	312
1050	42	25000	79.37	156.20	156.25	312
1100	44	40000	126.98	250	250	500
1200	48	40000	126.98	250	250	500
1350	54	63000	200.00	393.70	393.75	787
1400	56	63000	200.00	393.70	393.75	787
1500	60	63000	200.00	393.70	393.75	787
1600	64	63000	200.00	393.70	393.75	787
1650	66	63000	200.00	393.70	393.75	787
1800	72	100000	317.46	625	625	1250
1950	78	100000	317.46	625	625	1250
2000	80	100000	317.46	625	625	1250
2100	84	100000	317.46	625	625	1250
2200	88	160000	507.94	1000	1000	2000
2400	96	160000	507.94	1000	1000	2000

Q2 = 1.6 * Q1

Q4 = 1.25 * Q3

Q3/Q1 = R

Bore sizes and flange types

Bore size range

DN40 to 2400

Flanges to standards

ASME
AWWA
ISO 7005 EN1092-1
DIN
AS4087
AS2129
JIS

Pressure limitations for flanges

As per flange rating
PN25 max. process temperature 50 °C (122 °F)
PN40 max. process temperature 40 °C (104 °F)

Pressure equipment directive 2014/68/EU

This product is applicable in networks for the supply, distribution and discharge of water and associated equipment and is therefore exempt.

Bore and flange material

- DN40 to 200: SG iron
- DN250 to 2400: carbon steel
- Sizes DN40-200 coated with light grey 2-pack epoxy (RAL9002)
  - Primer: Interpon PZ660 zinc-based system, 70 microns thick
  - Top coat: Interpon 610 light grey polyester powder coating (RAL 9002), up to 150 microns thick, comparable to EN ISO 12944 grade C4
  - As a special requirement: 2-pack epoxy primer/finish @ 300 µm DFT
- Sizes DN250 - 400: In-organic Zinc based system for the flanges and painted Cast aluminum housing (Paint coat ≥ 80 µm, RAL 9002)
- Sizes DN450 -2400: Welded steel Design (Paint coat ≥ 80 µm, RAL 9002)

Terminal box for remote sensors

Polycarbonate

Environmental and process conditions

Ingress rating

- DN40 - 200 & DN450 - 2400 : IP68 (NEMA 6P) to 10 m (33 ft) for continuous submersion (Tested for 1500 hours according to IEC 60529)
- DN250 - 400: IP68 (NEMA 6P) to 10 m (33 ft) for periodic submersion (Tested for 1500 hours according to IEC 60529)
- For buriable applications (DN40 to 200, octagonal bore, polypropylene liner and DN450 to 2400, full bore, rubber liner)): 1 m < sensor depth ≤ 5 m

Temperature ranges

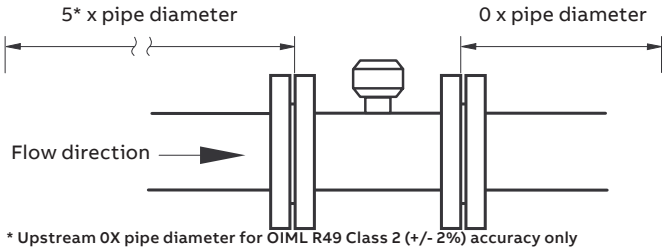
Ambient: –25 to 70 °C (–13 to 158°F)
Ambient (OIML R49): –25 to 55 °C (–13 to 131 °F)

		Process temperature	
Liner material	Bore size	Minimum	Maximum
Polypropylene	DN40 to 200	–6 °C (21 °F)	70 °C (158 °F)
Elastomer	DN250 to 600	–5 °C (23 °F)	50 °C (122 °F)
Hard rubber	DN250 to 2400	–10 °C (14 °F)	80 °C (176 °F)

Conductivity

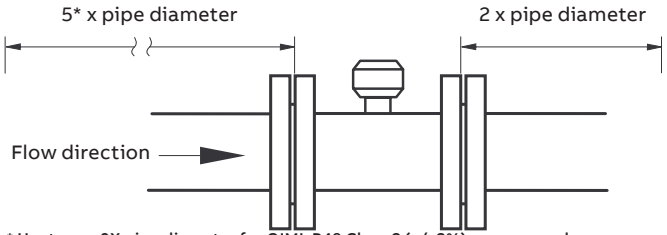
>20 µS/cm

Upstream and downstream pipe conditions (octagonal bore DN40 to 200)



*** Upstream 0X pipe diameter for OIML R49 Class 2 (+/- 2%) accuracy only**

Upstream and downstream pipe conditions (full bore DN250 to 2400)



*** Upstream 0X pipe diameter for OIML R49 Class 2 (+/- 2%) accuracy only**

Pressure loss

Flow rate	Pressure loss in bar (psi)
Q_3	<0.1 bar (1.5 psi) for DN40 and DN50 <0.16 bar (2.4 psi) for DN65 to DN250
Q_3	< 0.1 bar (1.5 psi) for sizes DN250 and larger

Potable water approvals

WRAS***
ACS (meter approval)
AZ/NZ 4020***
Certified to NSF/ANSI/CAN 61-G (meter approval)

Certified to
NSF/ANSI/CAN 61-G

***Material approval

...9 Specification

Metrological certifications

- OIML R49:2013 for accuracy class 1 and 2 and water temperature class T50 0.1 to 50 °C (32.18 to 122 °F)
- NMI R49 and NMI 10 for Australia
- Environmental class: O, M1, E1** and E2*
- MID MI-001
- PAC for China

			Mains powered				Battery/Renewable energy powered	
			Class 2.5 (R = 315)	Class 2 (R = 500)	Class 1 (R = 250)	Class 2.5 (R = 160)	Class 2 (R = 250)	Class 1 (R = 125)
DN	in	Q3 (m^3/h)	Q1 (m^3/h)	Q1 (m^3/h)	Q1 (m^3/h)	Q1 (m^3/h)	Q1 (m^3/h)	Q1 (m^3/h)
40	1½	40	0.127	0.08	0.08(1)	0.25	0.16	0.32
50	2	63	0.2	0.126	0.126(1)	0.394	0.25	0.504
65	2½	100	0.32	0.20	0.20(1)	0.625	0.40	0.4(2)
80	3	160	0.508	0.32	0.32(1)	1	0.64	0.64(2)
100	4	250	0.79	0.50	0.5(1)	1.56	1	1(2)
125	5	250	0.79	0.50	0.5(1)	1.56	1	1(2)
150	6	630	2	1.26	2.52	3.94	2.52	5.04
200	8	1000	3.17	2	4	6.25	4	8
250	10	1600	5.08	3.20	6.40	10	6.40	12.80
300	12	2500	7.94	5	10	15.625	10	20
350	14	4000	63.5(8)	40(3)	40(3)	25.0	16	16(2)
400	16	4000	63.5(8)	40(3)	40(3)	25.0	16	16(2)
450	18	6300	100(8)	63(3)	63(3)	39.375	25.20	25.2(2)
500	20	6300	100(8)	63(3)	63(3)	39.375	25.20	25.2(2)
600	24	6300	100(8)	63(3)	63(3)	63(3)	39.37(4)	78.75(5)
700	28	10000	80(7)	50(6)	100(3)	158.7(8)	100(3)	200(9)
750	30	10000	80(7)	50(6)	100(3)	158.7(8)	100(3)	200(9)
800	32	10000	80(7)	50(6)	100(3)	158.7(8)	100(3)	200(9)
900	36	10000	125(5)	80(7)	158.7(8)	250(10)	158.7(8)	-
1000	40	16000	128(7)	80(6)	160(3)	254(8)	160(3)	-
1050	42	16000	128(7)	80(6)	160(3)	254(8)	160(3)	-
1100	44	16000	200(5)	128(7)	253.9(8)	400(10)	254(8)	-
1200	48	16000	200(5)	128(7)	253.9(8)	400(10)	254(8)	-
1350	54	16000	254(8)	200(5)	400(10)	400(10)	400(10)	-
1400	56	16000	254(8)	200(5)	400(10)	400(10)	400(10)	-
1500	60	16000	254(8)	200(5)	400(10)	400(10)	400(10)	-
1600	64	16000	400(10)	200(5)	400(10)	400(10)	400(10)	-
1650	66	16000	400(10)	200(5)	400(10)	400(10)	400(10)	-
1800	72	16000	400(10)	317.5(9)	-	-	-	-

(1) R = 500, (2) R = 250, (3) R = 100, (4) R = 160, (5) R = 80, (6) R = 200,
(7) R = 125, (8) R= 63, (9) R = 50, (10) R = 40
Q2 = 1.6 * Q1
Q4 = 1.25 * Q3
Q3/Q1 = R

* Applicable only for internal antenna devices of FEX45X & all options of FEX43X

** Applicable for external antenna devices of FEX45X

10 Appendix

Declarations of conformity

IMPORTANT (NOTE)
All documentation, declarations of conformity, and certificates are available in ABB's download area: www.abb.com/flow.

Acknowledgments

- Sensus is a registered trademark of Sensus USA, Inc.
- Mylar is a registered trademark of DuPont Teijin Films.

Notes

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