



Australian Government
Department of Industry,
Science and Resources

National Measurement Institute

36 Bradfield Road, West Lindfield NSW 2070

Certificate of Approval NMI 14/3/21

Issued by the Chief Metrologist under Regulation 60
of the
National Measurement Regulations 1999

This is to certify that an approval for use for trade has been granted in respect of the instruments herein described.

KROHNE Model WATERFLUX 3070 Water Meter

submitted by KROHNE Australia Pty Ltd
5 Phiney Place
Ingleburn NSW 2565

NOTE: This Certificate relates to the suitability of the pattern of the instrument for use for trade only in respect of its metrological characteristics. This Certificate does not constitute or imply any guarantee of compliance by the manufacturer or any other person with any requirements regarding safety.

This approval has been granted with reference to document NMI R 49-1 Water Meters Intended for the Metering of Cold Potable Water and Hot Water, *Part 1 Metrological and Technical Requirements*, dated May 2022 and NMI M 10-1 Meters Intended for the Metering of Water in Full Flowing Pipes, *Part 1 Metrological and Technical Requirements*, dated July 2010.

This approval is subject to review at the decision of the Chief Metrologist in accordance with the conditions specified in the document NMI P 106.

DOCUMENT HISTORY

Rev	Reason/Details	Date
0	Pattern & variant 1 approved – certificate issued	23/05/14
1	Pattern & variant 1 amended (features/functions) – certificate issued	8/08/14
2	Pattern & variant 1 amended (flow rate ratios) – certificate issued	18/02/15
3	Pattern amended (software versions) – certificate issued	21/10/15

Rev	Reason/Details	Date
4	Variants 2 & 3 approved – certificate issued	24/08/16
5	Pattern (software versions) & variants (flowrate ratios) amended and variant 4 approved – certificate issued	28/03/17
6	Pattern & Variants 1 to 4 reviewed, variants 5 & 6 drafted from pattern, variants 7 to 10 approved – certificate issued	03/03/21
7	Variant 6 amended (software versions) – certificate issued	24/10/22
8	Variants 11 and 12 approved (hardware components) – certificate issued	24/04/24

CONDITIONS OF APPROVAL

General

Instruments purporting to comply with this approval shall be marked with pattern approval number 'NMI 14/3/21' and only by persons authorised by the submittor.

It is the submittor's responsibility to ensure that all instruments marked with this approval number are constructed as described in the documentation lodged with the National Measurement Institute (NMI) and with the relevant Certificate of Approval and Technical Schedule. Failure to comply with this Condition may attract penalties under Section 19B of the National Measurement Act and may result in cancellation or withdrawal of the approval, in accordance with document NMI P 106.

Signed by a person authorised by the Chief Metrologist to exercise their powers under Regulation 60 of the *National Measurement Regulations 1999*.



Alex Winchester
A/Manager
Policy and Regulatory Services

TECHNICAL SCHEDULE No 14/3/21

1. Description of Pattern

approved on 23/05/14

A DN40 sized KROHNE model WATERFLUX 3070 water meter used to measure cold potable and non-potable water supplies for trade.

1.1 Field of Operation

The field of operation of the measuring system using the DN40 sized KROHNE model WATERFLUX 3070 water meter is determined by the following characteristics:

Minimum flow rate, Q_1 :	0.10 m ³ /h
Transition flow rate, Q_2 :	0.16 m ³ /h
Maximum continuous flow rate, Q_3 :	40.00 m ³ /h
Overload flow rate, Q_4 :	50.00 m ³ /h
Flow rate ratio, Q_3/Q_1 :	400
Maximum admissible temperature:	50 °C
Temperature Class	T50
Maximum admissible pressure:	1600 kPa
Pressure loss class:	Δp 63
Accuracy class:	2
Flow profile sensitivity class:	U0/D0 – see table 1
Electromagnetic class:	E2 (industrial)
Environmental class:	O (indoor and outdoor)
Orientation:	All positions
Flow Direction:	Forward and Reverse
Power supply:	3.6 V DC battery

1.2 Features/Functions

The pattern (Figures 1 and 2) consists of a KROHNE model WATERFLUX 3070 electromagnetic flow sensor and a KROHNE model IFC 070 signal converter (calculator/indicator) mounted in a compact arrangement (Model 3070C) and has features/functions as listed below:

- Connection type: Flanged
- Display: A digital, electronic, liquid crystal display allowing for a maximum indication range of 99,999,999 m³ in 0.0001 m³ increments
- Communications⁽¹⁾: Optical keypad
Dual pulse for transmission of measured volume
- Materials: Flow sensor housing: aluminium
Signal converter: polycarbonate material
- Meter length: 150 mm

An optional strainer may also be fitted.

- ⁽¹⁾ The pattern and variants may be fitted and/or configured with the communication options listed in this Certificate. However, the primary indication of volume displayed by the indicating device of the meter is the approved indication of volume.

1.3 Conditions

1.3.1 Installation Conditions:

No flow straightener or flow conditioner is required.

For Accuracy Class 2, the flow profile sensitivity class is U0/D0.

For Accuracy Class 2.5, the installation conditions are specified in Table 1.

Table 1 - Minimum pipe lengths required by flow disturbance type

Disturbance Type ⁽¹⁾	Minimum upstream pipe length (mm)	Minimum downstream pipe length (mm)
1	0	0
2	0	0
3	0	0

- ⁽¹⁾ For information on the different types of flow disturbances which are examined as part of pattern approval, refer to NMI M 10-2.

1.3.2 Use conditions

The low flow cut-off setting is 10 mm/s. Measurements below this value are neglected.

1.3.3 Specified Installations and Open Channel Emplacements

The meter (pattern and variants) has not been tested or evaluated for performance in specified installations or open channel emplacements as part of this approval.

More information regarding specified installation and open channel emplacement testing may be found in NMI M 10-1 and NMI M 10-2.

1.3.4 Water Quality

The meter is approved for use in the metering of potable water supplies.

The meter is approved for use in the metering of non-potable water supplies of an unspecified nature.

1.4 Software Version

The Pattern is approved with the software version 4.0.4_.

Note: the Field Current can only be set to 16 mA.

1.5 Verification Provision

Provision is made for the application of a verification mark.

1.6 Sealing Provision

Provision is made for the instrument to be sealed by the application of one or more mechanical seals/destructible adhesive labels as shown in Figure 3. Provision is provided for utility seals to be applied to the meter as indicated in Figure 4.

1.7 Descriptive Markings and Notices

Instruments are marked with the following data, either grouped or distributed on the casing, the indicating device dial or an identification plate (Figure 5):

Manufacturer's name or mark	...
Serial number	...
Pattern approval number	NMI 14/3/21
Numerical value of maximum continuous flow rate, Q_3	...
Flow rate ratio, Q_3/Q_1	...
Unit of measurement	m^3
Maximum admissible pressure ⁽¹⁾	1600 kPa
Maximum pressure loss ⁽²⁾	63 kPa or Δp 63
Maximum admissible temperature ⁽³⁾	T50
Orientation ⁽⁴⁾	...
Flow profile sensitive class ⁽⁵⁾	U0/D0
Direction of flow	→ or similar
Accuracy class ⁽⁶⁾	2

⁽¹⁾ Optional for meters with MAP = 1400 kPa

⁽²⁾ Optional for class Δp 63

⁽³⁾ Optional for T30 meters

⁽⁴⁾ Optional for meters approved for all orientations

⁽⁵⁾ Optional for U0/D0 class meters

⁽⁶⁾ Optional for class 2 meters

For instruments that incorporate electronic devices, the following information can either be physically marked on the instrument or provided electronically via the indicating device or similar means:

Electromagnetic class	E2
Environmental class	O
For meters with an external power supply	the voltage and frequency
For battery powered meters	a replacement date or similar indication of expected battery life

2. Description of Variant 1

approved on 23/05/14

The Pattern and Variants are approved as Accuracy Class 2 (NMI R 49-1) and Accuracy Class 2.5 (NMI M 10-1) water meters with the meter sizes, flowrates and associated characteristics as specified in Tables 2.1 to 2.5 below. The Pattern is shown in **Bold** for completeness.

Table 2.1 Meter sizes, flowrates and related information

Meter size	DN25	DN25	DN40	DN40
Minimum flowrate Q ₁ (m ³ /h)	0.025	0.040	0.0625	0.100
Transitional flowrate Q ₂ (m ³ /h)*	0.040	0.064	0.1000	0.160
Maximum continuous flowrate Q ₃ (m ³ /h)	10	16	25	40
Overload flowrate Q ₄ (m ³ /h)	12.5	20	31.25	50
Ratio Q ₃ /Q ₁	400	400	400	400
Meter Length (mm)	150	150	150	150
Verification scale interval (m ³)	0.0001			

*Only applicable for Accuracy Class 2 meters

Table 2.2 Meter sizes, flowrates and related information

Meter size	DN50	DN50	DN65	DN65
Minimum flowrate Q ₁ (m ³ /h)	0.100	0.1575	0.1575	0.250
Transitional flowrate Q ₂ (m ³ /h)*	0.160	0.2520	0.2520	0.400
Maximum continuous flowrate Q ₃ (m ³ /h)	40	63	63	100
Overload flowrate Q ₄ (m ³ /h)	50	78.75	78.75	125
Ratio Q ₃ /Q ₁	400			
Meter Length (mm)	200			
Verification scale interval (m ³)	0.0001		0.001	

*Only applicable for Accuracy Class 2 meters

Table 2.3 Meter sizes, flowrates and related information

Meter size	DN80	DN80	DN100	DN100
Minimum flowrate Q ₁ (m ³ /h)	0.25	0.40	0.40	0.625
Transitional flowrate Q ₂ (m ³ /h)*	0.40	0.64	0.64	1.000
Maximum continuous flowrate Q ₃ (m ³ /h)	100	160	160	250
Overload flowrate Q ₄ (m ³ /h)	125	200	200	312.5
Ratio Q ₃ /Q ₁	400			
Meter Length (mm)	200		250	
Verification scale interval (m ³)	0.0001		0.001	

*Only applicable for Accuracy Class 2 meters

Table 2.4 Meter sizes, flowrates and related information

Meter size	DN125	DN125	DN150	DN150
Minimum flowrate Q ₁ (m ³ /h)	0.625	1.00	1.00	1.575
Transitional flowrate Q ₂ (m ³ /h)*	1.00	1.60	1.60	2.52
Maximum continuous flowrate Q ₃ (m ³ /h)	250	400	400	630
Overload flowrate Q ₄ (m ³ /h)	312.5	500	500	787.5
Ratio Q ₃ /Q ₁	400			
Meter Length (mm)	250		300	
Verification scale interval (m ³)	0.001			

*Only applicable for Accuracy Class 2 meters

Table 2.5 Meter sizes, flowrates and related information

Meter size	DN200	DN250	DN300
Minimum flowrate Q ₁ (m ³ /h)	1.575	2.50	4.00
Transitional flowrate Q ₂ (m ³ /h)*	2.52	4.00	6.40
Maximum continuous flowrate Q ₃ (m ³ /h)	630	1000	1600
Overload flowrate Q ₄ (m ³ /h)	787.5	1250	2000
Ratio Q ₃ /Q ₁	400		
Meter Length (mm)	350	400	500
Maximum admissible pressure (kPa)	1600	1000	1000
Verification scale interval (m ³)	0.01		

*Only applicable for Accuracy Class 2 meters

3. Description of Variant 2

approved on 24/08/16

The Pattern and Variants are approved as Accuracy Class 2 (NMI R 49-1) and Accuracy Class 2.5 (NMI M 10-1) water meters with the meter sizes, flowrates and associated characteristics as specified in Table 3 below.

Table 3 Meter sizes, flowrates and related information

Meter size	DN350	DN400	DN450	DN500	DN600
Minimum flowrate Q_1 (m ³ /h)	15.625	25	25	39.375	63
Transitional flowrate Q_2 (m ³ /h)*	25	40	40	63	100.8
Maximum continuous flowrate Q_3 (m ³ /h)	2500	4000	4000	6300	6300
Overload flowrate Q_4 (m ³ /h)	3125	5000	5000	7875	7875
Ratio Q_3/Q_1	160	160	160	160	100
Nominal length (mm)	500	600	600	600	600
Maximum admissible pressure (kPa)	1000				
Verification scale interval (m ³)	0.01	0.01	0.01	0.1	0.1

*Only applicable for Accuracy Class 2 meters

4. Description of Variant 3

approved on 24/08/16

The Pattern and Variants are approved as Accuracy Class 2.5 (NMI M 10-1) water meters with alternative measurement units of:

- a) Volume: megalitre (ML); and
- b) Flowrate: megalitre per hour (ML/h);

as specified in Tables 4.1 to 4.4 below.

Table 4.1 Meter sizes, flowrates and related information

Meter size	DN100	DN100	DN125	DN125
Minimum flowrate Q ₁ (ML/h)	0.04	0.0625	0.0625	0.01
Maximum continuous flowrate Q ₃ (ML/h)	0.16	0.25	0.25	0.4
Overload flowrate Q ₄ (ML/h)	0.20	0.3125	0.3125	0.5
Ratio Q ₃ /Q ₁	4	4	4	40
Nominal length (mm)	250	250	250	250
Maximum admissible pressure (kPa)	1600			
Verification scale interval (ML)	0.0001			

Table 4.2 Meter sizes, flowrates and related information

Meter size	DN150	DN150	DN200	DN250
Minimum flowrate Q ₁ (ML/h)	0.01	0.0158	0.0158	0.025
Maximum continuous flowrate Q ₃ (ML/h)	0.4	0.63	0.63	1
Overload flowrate Q ₄ (ML/h)	0.5	0.7875	0.7875	1.25
Ratio Q ₃ /Q ₁	40	40	40	40
Nominal length (mm)	300	300	350	400
Maximum admissible pressure (kPa)	1600			
Verification scale interval (ML)	0.0001			

Table 4.3 Meter sizes, flowrates and related information

Meter size	DN300	DN350	DN400	DN450
Minimum flowrate Q ₁ (ML/h)	0.04	0.16	0.25	0.25
Maximum continuous flowrate Q ₃ (ML/h)	1	2.5	4	4
Overload flowrate Q ₄ (ML/h)	1.25	3.125	5	5
Ratio Q ₃ /Q ₁	40	16	16	16
Nominal length (mm)	500	500	600	600
Maximum admissible pressure (kPa)	1600	1000		
Verification scale interval (ML)	0.001	0.01		

Table 4.4 Meter sizes, flowrates and related information

Meter size	DN500	DN600
Minimum flowrate Q ₁ (ML/h)	0.39	0.63
Maximum continuous flowrate Q ₃ (ML/h)	6.3	6.3
Overload flowrate Q ₄ (ML/h)	7.875	7.875
Ratio Q ₃ /Q ₁	16	10
Nominal length (mm)	600	600
Maximum admissible pressure (kPa)	1000	
Verification scale interval (ML)	0.01	

5. Description of Variant 4

**approved on 28/03/17
amended on 03/03/21**

The Pattern and Variants are approved with the following alternative power supply options:

- a) External battery pack with output 3,6 V
- b) FlexPower module with inbuilt battery back-up (optional for SW 5.0.1_ or higher) 10...30V DC or 110...230V AC / 50-60Hz

6. Description of Variant 5 **approved on 23/05/14**

The Pattern and Variants are approved with in an alternative remote arrangement (Figure 6) with the signal converter mounted remotely, and then known as a KROHNE model WATERFLUX 3070F 'Field' version.

7. Description of Variant 6 **approved on 23/05/14**
amended on 24/10/22

The Pattern and Variants are approved with any of the software versions listed in Table 5 below (in addition to Version 4.0.4_), which may be displayed by scrolling through the display pages.

Table 5 – Software versions

Software version	CRC Checksum
4.0.10_, 4.0.11_, 4.0.12_, 4.2.2_, 4.2.4_, 4.2.5_, 4.2.6_, 4.3.0_ and 4.3.1_	Not applicable
5.0.1_	4Cb5
5.0.2_	71d5
5.0.3_	CFF7
5.0.5_	dCAb
5.1.0_	Ab62

In the case of software versions 4.3.1_ or lower, the Field Current can only be set to 16 mA. In the case of software versions 5.0.1_ or higher, different Field Currents can be selected and shall be set to 16 mA.

8. Description of Variant 7 **approved on 03/03/21**

The Pattern and Variants approved as Accuracy Class 2 are approved with the alternative flowrate ratios (Q_3/Q_1) specified in Table 6.

Table 6 – Q_3/Q_1 Ratios (Accuracy Class 2)

DN25 to DN300	40; 50; 63; 80; 100; 125; 160; 200; 250; 315
DN350 to DN500	40; 50; 63; 80; 100; 125;
DN600	40; 50; 63; 80;

9. Description of Variant 8 **approved on 03/03/21**

The Pattern and Variants, excluding Variant 3, approved as Accuracy Class 2.5 are approved with the alternative flowrate ratios (Q_3/Q_1) specified in Table 7.

Table 7 – Q_3/Q_1 Ratios (Accuracy Class 2.5)

DN25 to DN300	10; 12.5; 16; 20; 25; 31.5; 40; 50; 63; 80; 100; 125; 160; 200; 250; 315
DN350 to DN500	10; 12.5; 16; 20; 25; 31.5; 40; 50; 63; 80; 100; 125;
DN600	10; 12.5; 16; 20; 25; 31.5; 40; 50; 63; 80;

10. Description of Variant 9

approved on 03/03/21

The Pattern and Variants, excluding Variant 3, are approved with all Q_3 values specified in NMI R 49-1 (2015), clause 4.1.3 that are less than the Q_3 values specified in Tables 2.1 to 2.5 and Table 3 for that size of meter and abiding by the approved Q_3/Q_1 ratios for the Accuracy Class.

For example, a DN100 sized meter approved as Accuracy Class 2.5, is approved with a Q_3 of 63 m³/h and a Q_3/Q_1 ratio of 10.

Note: NMI R 49-1 (2015), clause 4.1.3 is provided below for convenience.

The value of Q_3 , expressed in m³/h or kL/h, shall be chosen from the following list:

1	1.6	2.5	4	6.3
10	16	25	40	63
100	160	250	400	630
1 000	1 600	2 500	4 000	6 300

The list may be extended to higher or lower values in the series.

From the values given, for DN20 sized water meters the value of Q_3 shall be 4.

11. Description of Variant 10

approved on 03/03/21

The Pattern and Variants are approved with the KROHNE WATERFLUX 3000 electromagnetic flow sensor and the IFC 300 signal converter (incorporating the indicating device) (Figures 7 to 11).

12. Description of Variant 11

approved on 24/04/24

The Pattern and Variants are approved with an alternative Modbus printed circuit board as described in Documentation folder no. T10201-11.

13. Description of Variant 12

approved on 24/04/24

The Pattern and Variants are approved with an alternative Micro Controller Unit as described in Documentation folder no. T10201-11.

TEST PROCEDURE No 14/3/21

This Approval and Certificate is issued only with respect to the design (the pattern and variants) of the water meter described herein. The calibration and measurement accuracy of individual water meters manufactured and marked in accordance with the approved pattern and variants should be verified in accordance with the test procedures specified below, or as required by relevant legislation.

Water meters tested for initial verification shall comply with the Certificate of Approval, Technical Schedule, and the maximum permissible errors for initial and subsequent verifications at the operating conditions in effect at the time of verification. Maximum permissible errors for the initial and subsequent verification of water meters are given in the *National Trade Measurement Regulations 2009* (Cth).

Water meters shall be verified in accordance with NITP 14 *National Instrument Test Procedures for Utility Meters*.

The following exceptions apply for Accuracy Class 2.5 meters:

- The maximum permissible errors shall be:
 $\pm 2.5\%$ within the flowrate range Q_1 to Q_4 .
- The flow rates specified for initial verification in NMI M 10-2 may replace the flow rates specified in NITP 14.

NOTE: NMI reserves the right to vary this procedure. Any such variation shall be notified in writing by NMI.

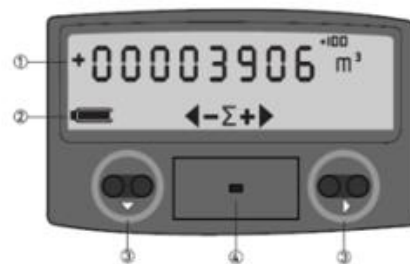
FIGURE 14/3/21 – 1



Compact		
	WATERFLUX 3070 C – IP68	WATERFLUX 3070 C – IP67

KROHNE Model WATERFLUX 3070 DN40 Water Meter (including 'IP68 Ingress Protection' style housings) – 'Compact' Version (Model 3070C) – The Pattern

FIGURE 14/3/21 – 2



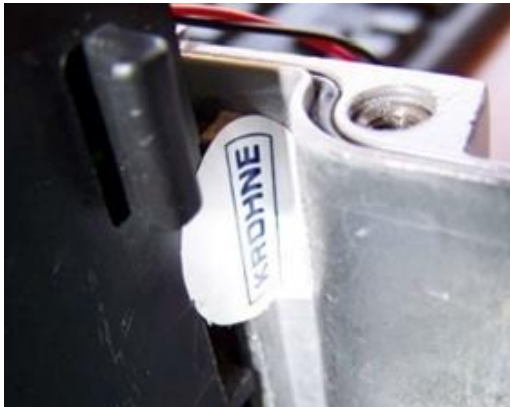
Indicating device of a KROHNE Model IFC 070 Signal Converter

FIGURE 14/3/21 – 3

- (a) Hardware switch - Secures hardware switch, sealed against activation

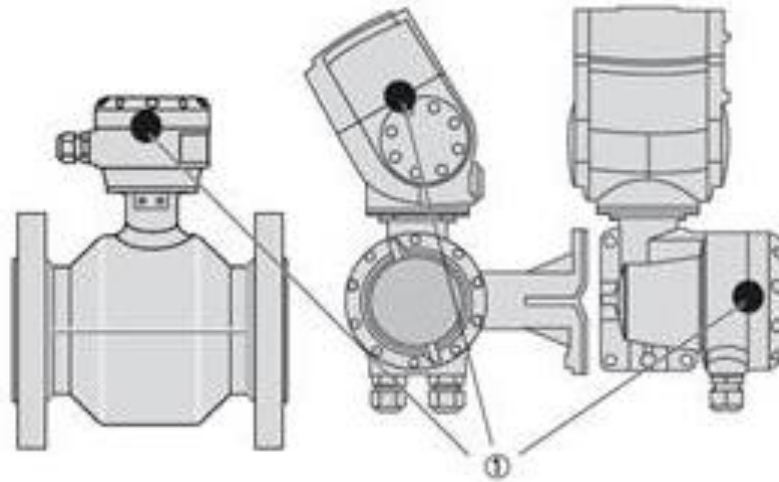


- (b) Electronics unit sealed against removal

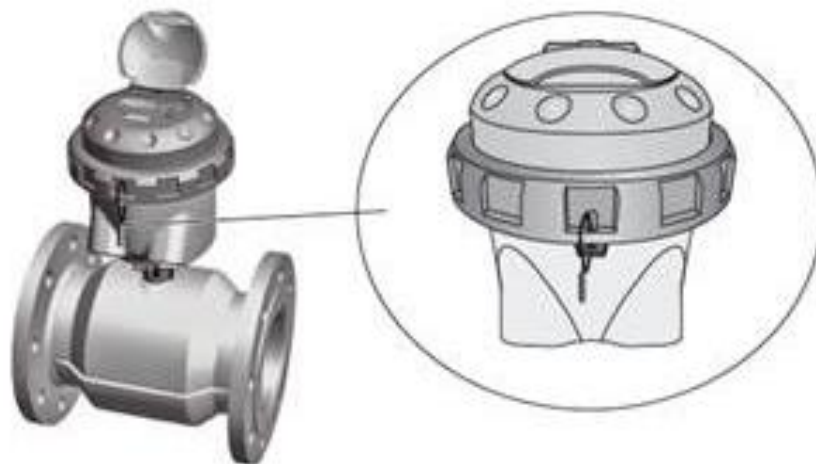


Typical Sealing Methods

FIGURE 14/3/21 – 4






(a) For IP67 version meters



(b) For IP68 version meters

Typical Provisions of Utility Seals

FIGURE 14/3/21 – 5

	Altometer, Dordrecht The Netherlands	
IFC070 F S/N: A14 BERTONE Manufactured: 2014 in The Netherlands		Battery powered 3.6 V Battery life time: specified in manual ER4.3.4_
GK070: 6.178 DN 40 mm/1.5 inch Wetted materials: PPX V4A		  www.krohne.com
IP67 MAP: 16 bar		Approval no.: NMI14/3/21 Tamb: -10 °C / +55 °C
<div style="border: 1px solid black; padding: 2px;">AUS sample</div>		Max pressure loss: 43 kPa Q3=40 m ³ /h; R=400; MAP=16

Typical Marking Arrangement

FIGURE 14/3/21 – 6



(b)

KROHNE Model WATERFLUX 3070 DN40 Water Meter (including 'IP68 Ingress Protection' style housings) – 'Field' Version (Model 3070F) – Variant 5

FIGURE 14/3/21 – 7



IFC 300 signal converter – Indicating Device – Variant 10

FIGURE 14/3/21 – 8



IFC 300 signal converter – Sealing arrangements, Product label – Variant 10

FIGURE 14/3/21 – 9



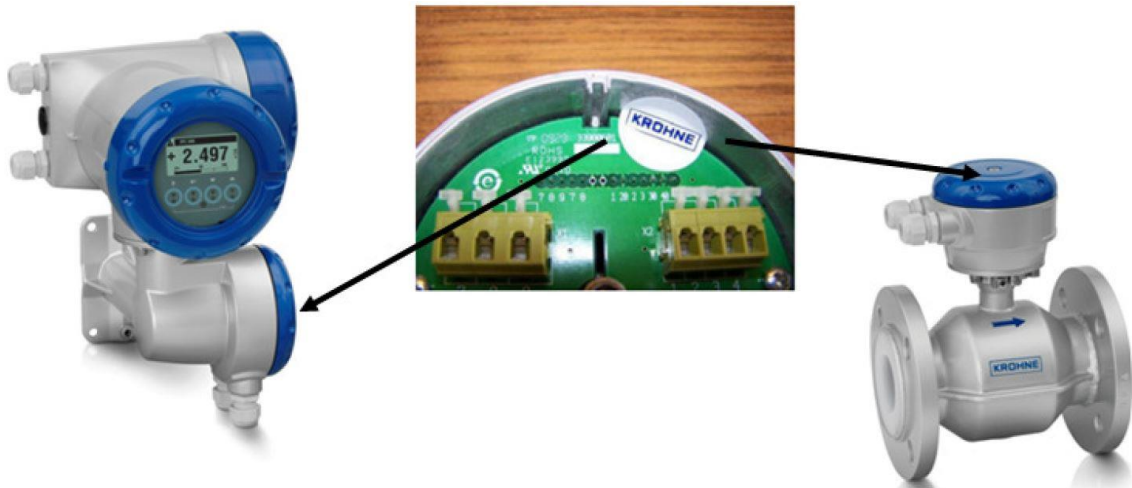
IFC 300 signal converter – Physical seal – Variant 10

FIGURE 14/3/21 – 10



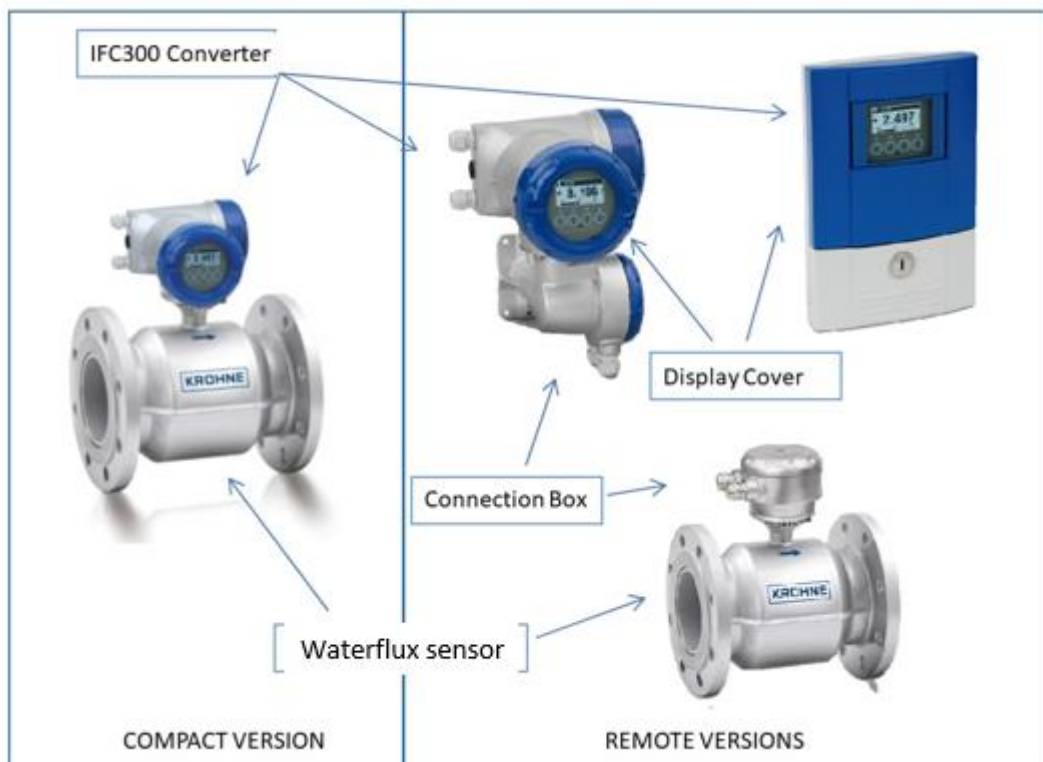
IFC 300 signal converter – Weights and Measures jumper– Variant 10

FIGURE 14/3/21 – 11



IFC 300 signal converter – Sealing arrangements (remote connection box PCB) – Variant 10

FIGURE 14/3/21 – 12



Remote arrangement – Variant 10

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