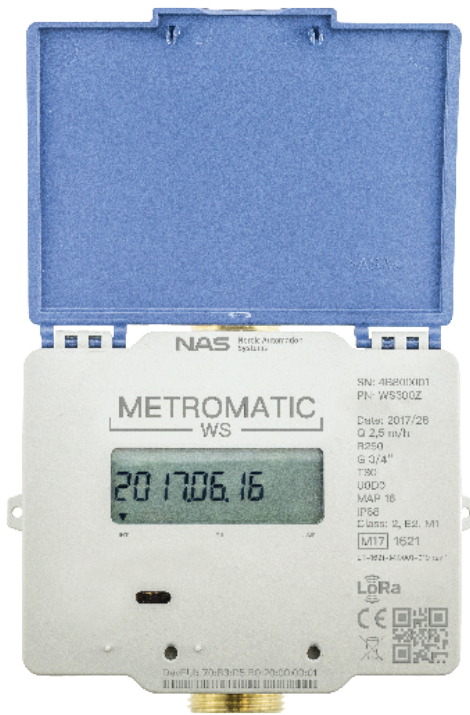


# METROMATIC WS CMM030

PRELIMINARY



Ultrasonic water meter Metromatic WS is designed for measurement of cold and hot water consumption in households and blocks of flats, as well for industrial applications

Internal LoRaWAN™ communication module enables the acquisition of consumption data and transmits it wirelessly to the available LoRaWAN™ network.

# OVERVIEW

## Efficient

Metromatic WS LoRaWAN™ communication module has bidirectional, battery powered, long range transceiver with low power consumption.

## Intelligent

Real-time usage data is gathered wirelessly and processed automatically. Data is accessible from your LoRaWAN™ provider.

# APPLICATIONS

## Water metering

Hot and cold water metering using ultrasonic technology.

# FEATURES

- Temperature class T30, T30/T90, T90
- Nominal flow 2.5-63 m<sup>3</sup>/h
- Dynamic range up to  $Q_3/Q_1 = R250$
- No straight sections required
- No measurement of air
- Ambient class B/C
- Protection class IP68
- Nominal pressure PN16/25 bar
- Internal data logger
- Battery lifetime > 16 years\*
- Measure reverse flow (to separate register)
- Flow direction indication
- Long range wireless data transmission
- Configurable reporting interval
- Secure communication

\*

# SPECIFICATIONS

Length:	110-350 mm
Width:	116.6 - 196 mm
Height:	80.4- 196 mm
Weight:	
Ambient temperature:	+5°C ... +65°C
Ambient Class:	Class B / EN 14154
Installation position:	All positions
Nominal pressure	PN16/25 bar
Pressure loss:	0.63 / (0.25) bar
Q <sub>3</sub> :	2.5 / 6.3 / 10 / 16 / 25 / 40 / 63 m <sup>3</sup> /h
R:	250 m <sup>3</sup> /h
Communication range:	up to 15km*
Tx power:	up to +20dBm
Rx Sensitivity:	-140dBm
MAC Layer:	LoRaWAN™
Physical Layer:	LoRa®
Body material:	
IP Rating:	IP68
Communication:	LoRaWAN™
LoRa Device Class:	A
Battery:	2 x AA 3,6V 2.4Ah (LiSOCl <sub>2</sub> )

# DATA REGISTRATION

- Total volume
- Forward volume
- Reverse volume
- Maximum flow rate and date
- Minimum flow rate and date
- Operating time without error
- Error code
- Time when flow rate exceeded  $1.2 Q_4$
- Time when flow rate was less than  $Q_1$

# ERROR CODES

- Battery low alarm
- Air in pipe
- Leak detection

# DATA LOGGER

- Every hour, day and month values of the measured parameters are stored in internal memory
- Data logger records of monthly parameters can be seen on the display

# DISPLAY

Layout



# COMMUNICATION

Bit order:	LSB
Usage reporting:	Unconfirmed messages
Status reporting:	Confirmed messages

# PORT LIST

fPort	Usage	Format	Uplink	Unit	Comment
24	Status		yes	-	Defined below
25	Usage		yes	-	Defined below
50	Configuration		no	-	Defined below
99	Boot/Debug		yes	-	Defined below

# fPort 24 Status Message

Byte 0	Byte 1	Byte 2	Byte 3	Byte 4	Byte 5	Byte 6	Byte 7	Byte 8	Byte 9	Byte 10	Byte 11-26(max)	
LoRa Battery	Sensor RSSI	Volume			Meter error code				Register Map	Register payload		
uint8	int8	int32 - Liters FFFFFFFF - No connection to meter			Meter specific error codes* FFFFFFFF - No connection to meter							

Register map				Payload
Bit #	Register	Unit	Value	
0	RFU	n/a	0	n/a
1	RFU			
2	RFU			
3	RFU			
4	Flow rate	m <sup>3</sup> /h	0 - not sent with status message	n/a
5	RFU	n/a	0	n/a
6	RFU			
7	RFU			

\* See meter error map

# fPort 25 Usage message

Byte 0	Byte 1	Byte 2	Byte 3	Byte 4	Byte 5-36(max)
Volume				Register Map	Register payload
int32 - Liters					

Register map				Payload
Bit #	Register	Unit	Value	
0	RFU	n/a	0	n/a
1	RFU			
2	RFU			
3	RFU			
4	Flow rate	m <sup>3</sup> /h	0 - not sent 1 - sent	float IEEE754 - 32bit
5	RFU	n/a	0	n/a
6	RFU			
7	RFU			



# fPort 50 Configuration Message

Byte0	Byte ...	Byte n
Header	Payload	

Different headers with their respective payloads are described below

## Reporting

Byte 0	Byte 1	Byte 2	Byte 3	Byte 4	Byte 5	Byte 6	Byte 7	Byte 8
Header	Usage interval (seconds)				Status interval (seconds)			
00	uint32* default - 3600				uint32** default - 86400			

\* Can't be configured shorer than 600. When set to 0 disables usage packets. When there is no connection to the meter, the usage messages are replaced by status messages

\*\* Can't be configured shorer than 600.

# fPort 99 Boot/Debug Message

Byte 0	Byte 1	Byte 2	Byte 3	Byte 4	Byte 5	Byte 6	Byte 7	Byte 8	Byte 9	Byte 10	Byte 11
Header (HEX)	Payload										
0x00 Boot	Serial (HEX)			Firmware (HEX)			Meter ID (HEX)				

# BATTERY OFFSET CHART

255 - Not measured



254 - 3,6V  
 253 - 3,55V  
 252 - 3,5V  
 251 - 3,45V  
 250 - 3,4V  
 249 - 3,35V  
 248 - 3,3V  
 247 - 3,25V  
 246 - 3,2V  
 245 - 3,15V  
 244 - 3,146V  
 243 - 3,142V  
 242 - 3,138V  
 241 - 3,134V  
 240 - 3,13V  
 239 - 3,126V  
 238 - 3,122V  
 237 - 3,118V  
 236 - 3,114V  
 235 - 3,11V  
 234 - 3,106V  
 233 - 3,102V  
 232 - 3,098V  
 231 - 3,094V  
 230 - 3,09V  
 229 - 3,086V  
 228 - 3,082V  
 227 - 3,078V  
 226 - 3,074V  
 225 - 3,07V  
 224 - 3,066V  
 223 - 3,062V  
 222 - 3,058V  
 221 - 3,054V  
 220 - 3,05V  
 219 - 3,046V  
 218 - 3,042V  
 217 - 3,038V  
 216 - 3,034V  
 215 - 3,03V  
 214 - 3,026V  
 213 - 3,022V  
 212 - 3,018V  
 211 - 3,014V  
 210 - 3,01V  
 209 - 3,006V  
 208 - 3,002V  
 207 - 2,998V  
 206 - 2,994V  
 205 - 2,99V

204 - 2,986V  
 203 - 2,982V  
 202 - 2,978V  
 201 - 2,974V  
 200 - 2,97V  
 199 - 2,966V  
 198 - 2,962V  
 197 - 2,958V  
 196 - 2,954V  
 195 - 2,95V  
 194 - 2,946V  
 193 - 2,942V  
 192 - 2,938V  
 191 - 2,934V  
 190 - 2,93V  
 189 - 2,926V  
 188 - 2,922V  
 187 - 2,918V  
 186 - 2,914V  
 185 - 2,91V  
 184 - 2,906V  
 183 - 2,902V  
 182 - 2,898V  
 181 - 2,894V  
 180 - 2,89V  
 179 - 2,886V  
 178 - 2,882V  
 177 - 2,878V  
 176 - 2,874V  
 175 - 2,87V  
 174 - 2,866V  
 173 - 2,862V  
 172 - 2,858V  
 171 - 2,854V  
 170 - 2,85V  
 169 - 2,846V  
 168 - 2,842V  
 167 - 2,838V  
 166 - 2,834V  
 165 - 2,83V  
 164 - 2,826V  
 163 - 2,822V  
 162 - 2,818V  
 161 - 2,814V  
 160 - 2,81V  
 159 - 2,806V  
 158 - 2,802V  
 157 - 2,798V  
 156 - 2,794V  
 155 - 2,79V  
 154 - 2,786V  
 153 - 2,782V  
 152 - 2,778V  
 151 - 2,774V  
 150 - 2,77V  
 149 - 2,766V

148 - 2,762V  
 147 - 2,758V  
 146 - 2,754V  
 145 - 2,75V  
 144 - 2,746V  
 143 - 2,742V  
 142 - 2,738V  
 141 - 2,734V  
 140 - 2,73V  
 139 - 2,726V  
 138 - 2,722V  
 137 - 2,718V  
 136 - 2,714V  
 135 - 2,71V  
 134 - 2,706V  
 133 - 2,702V



132 - 2,698V  
 131 - 2,694V  
 130 - 2,69V  
 129 - 2,686V  
 128 - 2,682V  
 127 - 2,678V  
 126 - 2,674V  
 125 - 2,67V  
 124 - 2,666V  
 123 - 2,662V  
 122 - 2,658V  
 121 - 2,654V  
 120 - 2,65V  
 119 - 2,646V  
 118 - 2,642V  
 117 - 2,638V  
 116 - 2,634V  
 115 - 2,63V  
 114 - 2,626V  
 113 - 2,622V  
 112 - 2,618V  
 111 - 2,614V  
 110 - 2,61V  
 109 - 2,606V  
 108 - 2,602V



107 - 2,598V  
 106 - 2,594V  
 105 - 2,59V  
 104 - 2,586V  
 103 - 2,582V

102 - 2,578V  
 101 - 2,574V  
 100 - 2,57V  
 99 - 2,566V  
 98 - 2,562V  
 97 - 2,558V  
 96 - 2,554V  
 95 - 2,55V  
 94 - 2,546V  
 93 - 2,542V  
 92 - 2,538V  
 91 - 2,534V  
 90 - 2,53V  
 89 - 2,526V  
 88 - 2,522V  
 87 - 2,518V  
 86 - 2,514V  
 85 - 2,51V  
 84 - 2,506V  
 83 - 2,502V



82 - 2,498V  
 81 - 2,494V  
 80 - 2,49V  
 79 - 2,486V  
 78 - 2,482V  
 77 - 2,478V  
 76 - 2,474V  
 75 - 2,47V  
 74 - 2,466V  
 73 - 2,462V  
 72 - 2,458V  
 71 - 2,454V  
 70 - 2,45V  
 69 - 2,446V  
 68 - 2,442V  
 67 - 2,438V  
 66 - 2,434V  
 65 - 2,43V  
 64 - 2,426V  
 63 - 2,422V  
 62 - 2,418V  
 61 - 2,414V  
 60 - 2,41V  
 59 - 2,406V  
 58 - 2,402V  
 57 - 2,398V  
 56 - 2,394V  
 55 - 2,39V  
 54 - 2,386V  
 53 - 2,382V  
 52 - 2,378V

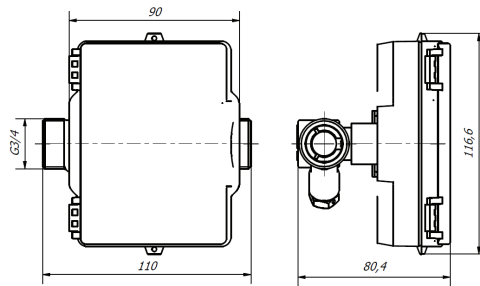
51 - 2,374V  
 50 - 2,37V  
 49 - 2,366V  
 48 - 2,362V  
 47 - 2,358V  
 46 - 2,354V  
 45 - 2,35V  
 44 - 2,346V  
 43 - 2,342V  
 42 - 2,338V  
 41 - 2,334V  
 40 - 2,33V  
 39 - 2,326V  
 38 - 2,322V  
 37 - 2,318V  
 36 - 2,314V  
 35 - 2,31V  
 34 - 2,306V  
 33 - 2,302V  
 32 - 2,298V  
 31 - 2,294V  
 30 - 2,29V  
 29 - 2,286V  
 28 - 2,282V  
 27 - 2,278V  
 26 - 2,274V  
 25 - 2,27V  
 24 - 2,266V  
 23 - 2,262V  
 22 - 2,258V  
 21 - 2,254V  
 20 - 2,25V  
 19 - 2,246V  
 18 - 2,242V  
 17 - 2,238V  
 16 - 2,234V  
 15 - 2,184V  
 14 - 2,134V  
 13 - 2,084V  
 12 - 2,034V  
 11 - 1,984V  
 10 - 1,934V  
 9 - 1,884V  
 8 - 1,834V  
 7 - 1,784V  
 6 - 1,734V  
 5 - 1,684V  
 4 - 1,634V  
 3 - 1,584V  
 2 - 1,534V  
 1 - 1,484V

0 - N/A

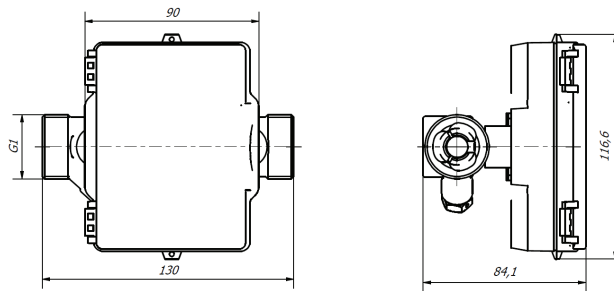
# METER ERROR MAP

Status message byte #	Bit #	Error (bit = 1)	LCD indication code "Error xxx"
6	0	-	
	1	-	
	2	Hardware status flag Er02	8000
	3	Hardware status flag Er03	8000
	4	End of battery life time	1000
	5	Hardware status flag Er05	0008
	6	-	
	7	-	
7	0	Leakage	0100
	1	Burst	0200
	2	Flow sensor is empty	0001
	3	Reverse flow	0002
	4	Flow rate is less than qi	
	5	-	
	6	-	
	7	-	
8	0	-	
	1	-	
	2	-	
	3	-	
	4	-	
	5	-	
	6	-	
	7	-	
9	0	Hardware status flag Er30	0880
	1	-	
	2	-	
	3	-	
	4	Flow rate greater 1,2qs	0004
	5	Hardware status flag Er35	8000
	6	-	
	7	Hardware status flag Er37	8000

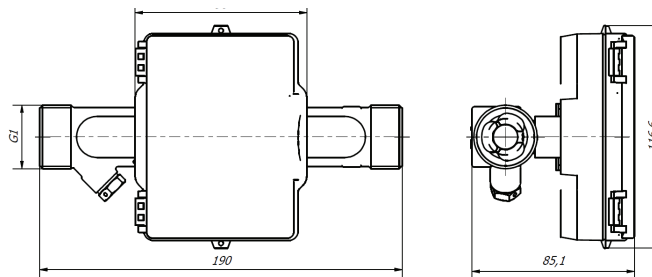
# DIMENSIONS



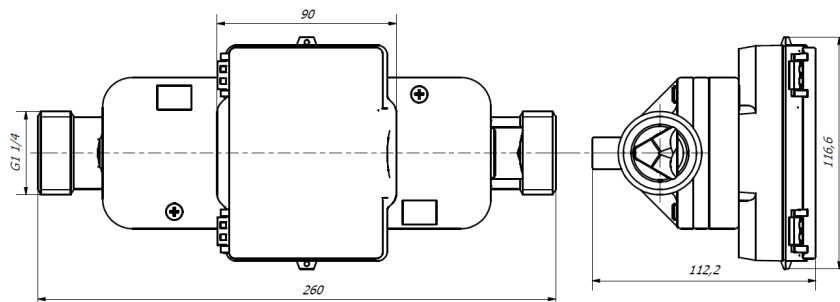
CMM030x#0 - G3/4" thread connection



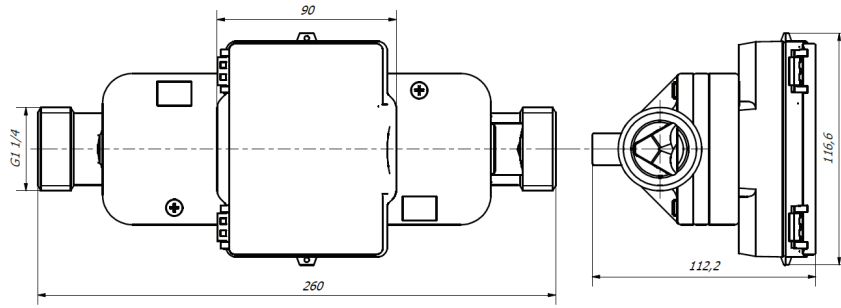
CMM030x#1 - G1" thread connection



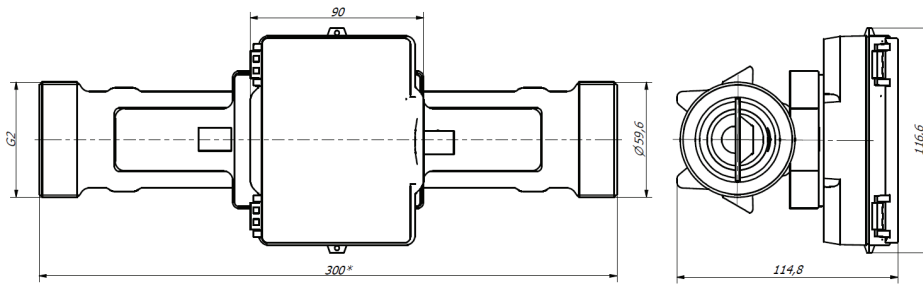
CMM030x#2 - G1" thread connection



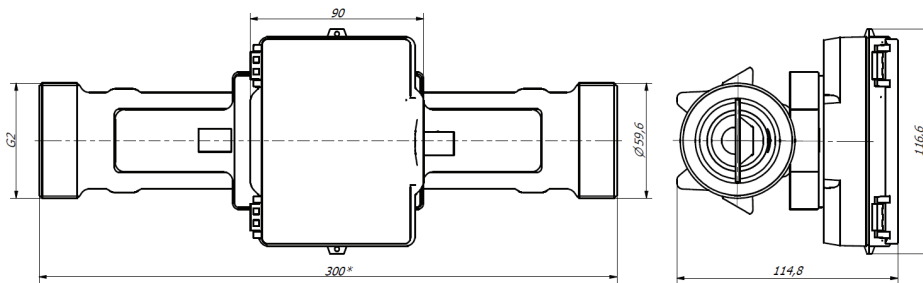
CMM030x#3 - G1 1/4" thread connection



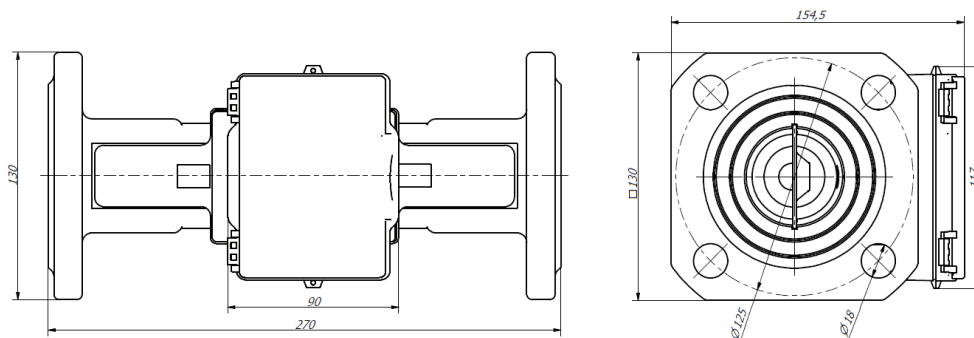
CMM030x#4 - G1 1/4" thread connection



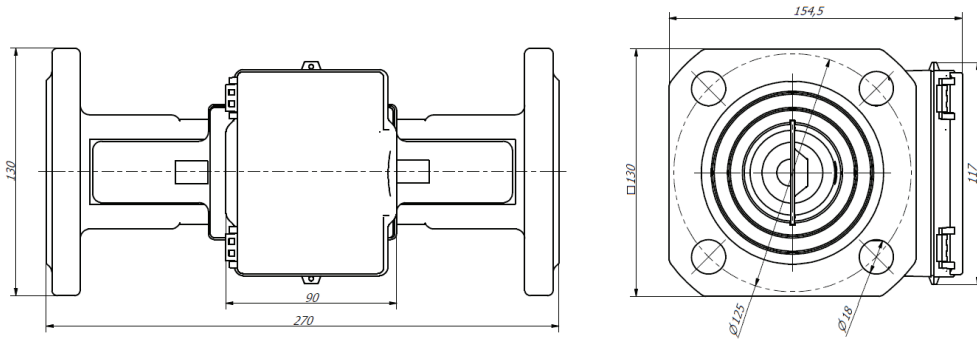
CMM030x#5 - G2" thread connection



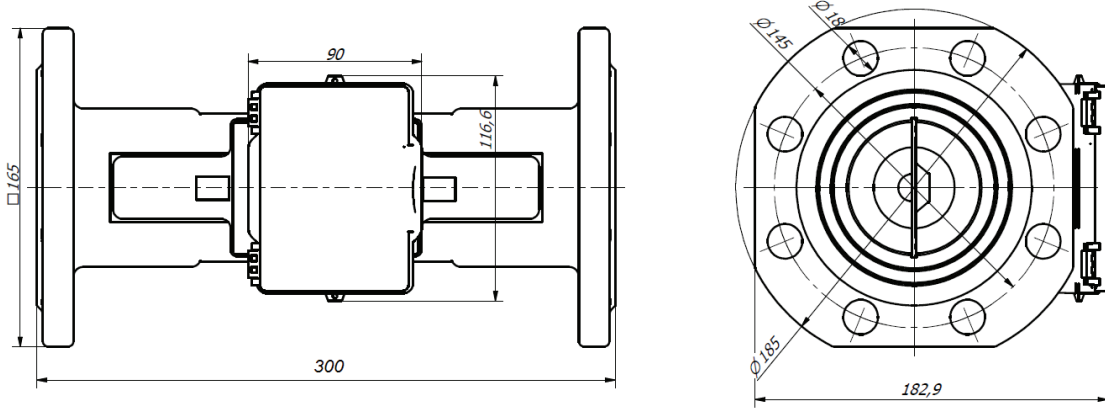
CMM030x#6 - G2" thread connection



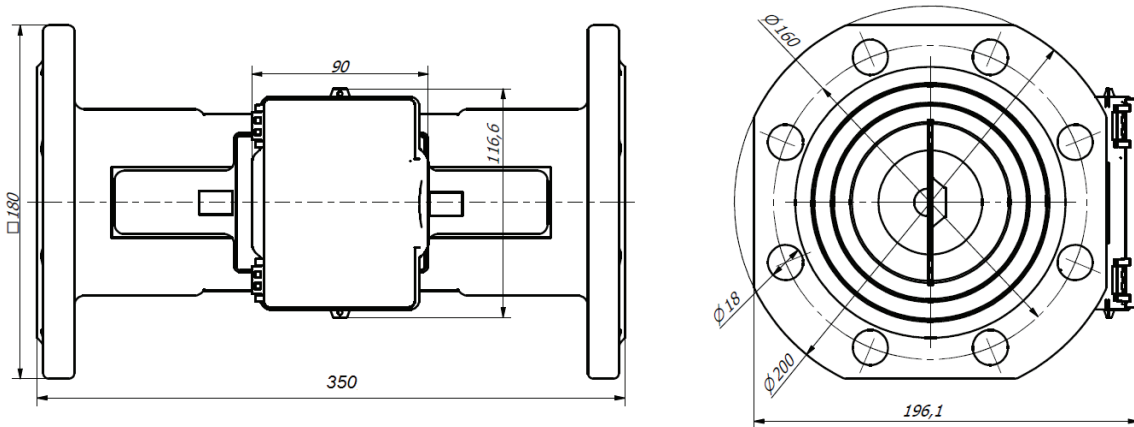
CMM030x#7 - DN50FL flanged connection



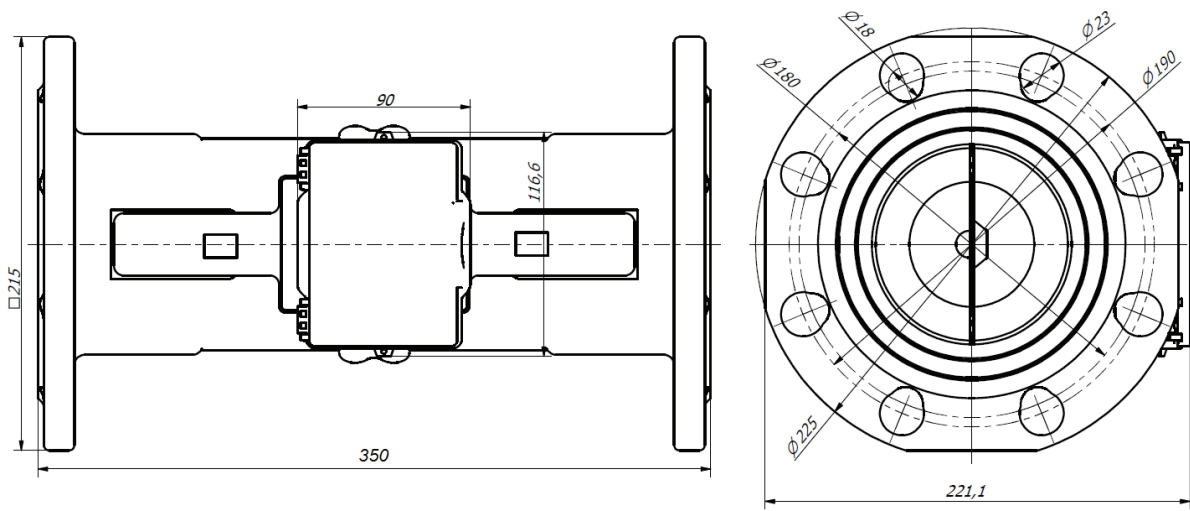
CMM030x#8 - DN50FL flanged connection



CMM030x#9 - DN65FL flanged connection



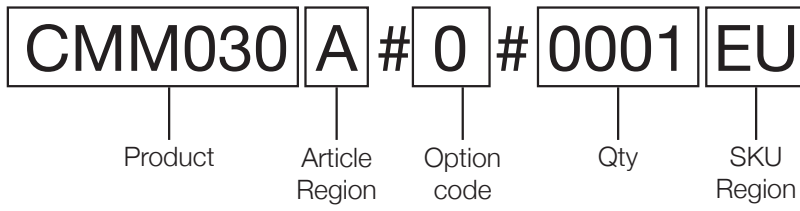
CMM030x#A - DN80FL flanged connection



CMM030x#B - DN100FL flanged connection



# ORDERING INFORMATION



Product/SKU	Package qty	IP Rating
CMM030x#x#0001xx	1	IP68

Article region	SKU region	Frequency
A	EU	868 MHz
B	AU	922 MHz
C	US	915 MHz
D	AS	923 MHz
E	CN	780 MHz
F	KR	922 MHz
G	EU	433 MHz
H	CN	470 MHz
I	IN	866 MHz

Option Code	Size	Body Length	Connection	Q <sub>3</sub>	R
0	DN15	110 mm	G3/4"	2.5	R250
1	DN20	130 mm	G1"	2.5	R250
2	DN20	190 mm	G1"	2.5	R250
3	DN25	260 mm	G1 ¼"	6.3	R250
4	DN25	260 mm	G1 ¼"	10	R250
5	DN40	300 mm	G2"	10	R250
6	DN40	300 mm	G2"	16	R250
7	DN50FL	270 mm	DN50FL	16	R250
8	DN50FL	270 mm	DN50FL	25	R250
9	DN65FL	300 mm	DN65FL	25	R250
A	DN80FL	350 mm	DN80FL	40	R250
B	DN100FL	350 mm	DN100FL	63	R250

## CONTACT INFORMATION

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# REVISION HISTORY

0.1 - First draft

All content contained herein is subject to change without notice. Nordic Automation Systems reserves the right to change or modify the content at any time.